

AER SUBMISSION NON SYSTEM ASSETS-ICT INVESTMENT PLAN

DOCUMENT PURPOSE AND STRUCTURE

Document Purpose

This document sets out the ICT capital and operating expenditure forecasts to ensure delivery of the technology capabilities required by Endeavour Energy over the 2015-2019 AER determination period.

Document Structure

The document has been developed in consultation with the Executive Leadership Team, Branch Managers and Process Owners in relevant areas across Endeavour. Input has been drawn from Networks NSW as well as insights arising from external stakeholder engagements.

The structure of the document is as follows:

Section	Heading	Description
Part 1	Executive Summary	<ul style="list-style-type: none"> Overview of the ICT 2015-2019 AER Submission highlighting key points.
	Alignment to Group and Corporate Strategic Plans	<ul style="list-style-type: none"> Endeavour's rationalisation for ICT expenditure is clearly linked to the achievement of the strategic plans and outcomes for each Division within Endeavour to meet the strategic goals and outcomes for Endeavour and Network NSW. Contains a brief outline of level of forecasted expenditure for capital and operational expenditure and key investment areas.
	Investment Context	<ul style="list-style-type: none"> Provides the Industry, Technology and Network NSW challenges and impacts influencing the level and direction of ICT investment required to achieve outcomes over next five year period.
	Performance in the 2009-2014 AER Period	<ul style="list-style-type: none"> Describes the challenges and achievements experienced in the current AER period and outlines the economic justification for the outlays and variation to forecast.
	ICT Capital Expenditure Plan	<ul style="list-style-type: none"> Explains processes used for forecasting and prioritising the ICT initiatives supporting the submission. Explains the processes employed to devise the plan, and includes the management, monitoring and measurement processes and metrics to use to deliver outcomes. Describes the methodology for forecasting the costs and estimated benefits for the ICT initiatives outlined in the submission. Provides an explanation of the ICT capital expenditure programmes of work and alignment to the AER capital expenditure objectives. Compliance to AER capital expenditure objectives.
	ICT Operational Expenditure Plan	<ul style="list-style-type: none"> Explains processes used for forecasting and prioritising the ICT initiatives supporting the submission. Explains the processes employed to devise the plan, and includes the management, monitoring and measurement processes and metrics to use to deliver outcomes. Describes the methodology for forecasting the costs and estimated benefits for the ICT initiatives outlined in the

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		<ul style="list-style-type: none"> submission. Details the ICT operating expenditure forecast and alignment to AER operating expenditure objectives.
Part 2	Safety Management	<ul style="list-style-type: none"> Outline program of work to support Safety Management Strategic Objective.
	Deliver the Network Plan	<ul style="list-style-type: none"> Outline program of work to support Deliver the Network Plan Strategic Objectives.
	Network Billing and Customer Management	<ul style="list-style-type: none"> Outline program of work to support Network Billing and Customer Management Strategic Objectives.
	Finance and Risk Management	<ul style="list-style-type: none"> Outline program of work to support Finance and Risk Strategic Objectives.
	Performance Through People	<ul style="list-style-type: none"> Outline program of work to support Performance Through People Strategic Objectives.
	IT Service Delivery	<ul style="list-style-type: none"> Outline program of work to support Leverage Technology Strategic Objectives.
	Supporting Documentation	<ul style="list-style-type: none"> Appendix A – Abbreviations Appendix B – Project Cost Model Appendix C – Endeavour Energy's ICT Metrics Appendix D – Unprioritised Program Appendix E – Demonstration of Prioritisation Appendix F – Workforce Scheduling - Case For Change Appendix G – Workforce Scheduling Phase 1 Business Case Appendix H – Phase 2 Business Case – ESS/MSS and Online Timesheets

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EXECUTIVE SUMMARY

Endeavour Energy's ICT regulatory proposal includes a total capital expenditure of \$89 million¹ and a total operating expenditure of \$198 million² which is required to maintain the quality, reliability and security of supply of standard control services and to maintain the reliability, safety and security of the distribution system.

\$ Millions	2015	2016	2017	2018	2019	Total
Capital Expenditure	16.39	16.09	17.76	21.15	17.63	89.02
Operating Expenditure	38.53	37.14	38.91	40.77	42.69	198.05

Endeavour Energy's proposed capital expenditure represents a reduction of \$30 million (25%) from the previous AER determination for the period 2009-2014 of \$118.8 million. This represents a 5% decrease on actual capital expenditure from the current determination period.

Endeavour Energy's proposed operating expenditure represents a reduction of \$1.5 million on actual spend of \$199.6 million in the current determination period. This is detailed in the ICT Operating Expenditure Plan section within this document.

The proposed standard control capital and operating expenditure forecast for the 2015-2019 AER period is required to achieve Endeavour Energy's ICT Investment Plan. This forecast is based on a realistic expectation of the ICT demand forecast, historical cost inputs and includes cost reduction programs and initiatives to ensure customers only pay for the efficient costs of delivering essential network services.

Overview

The primary role of the ICT function within Endeavour Energy is to ensure the reliability, performance and security of technology systems, data and end point devices. ICT provides critical business support to meet our obligations as a Distribution Network Service Provider (DNSP). In the absence of technology, Endeavour would not be able to operate the current network, undertake effective planning of the network, or fulfil our corporate obligations. Technology provides the following core capabilities:

- ICT systems are instrumental in delivering our network and corporate functions such as asset management, customer management, and financial reporting;
- Prudently adopting technology enables us to deliver better services to our customers at a lower cost over time; and
- Technology is viewed as a strategic enabler that supports business objectives.

1 Adjusted to reflect regulated capital expenditure to align to AER allowance calculation

2 Adjusted to reflect standard control services t to align to AER allowance calculation

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Endeavour Energy's proposal for ICT expenditure is required to maintain and improve infrastructure, systems functionality and ICT services needed to deliver Endeavour Energy's strategic outcomes of:

- Continuously improving safety performance;
- Maintaining the reliability and sustainability of the network;
- Containing average distribution network tariff increases to CPI for our customers; and
- Delivering consistent results to our stakeholder, the NSW Government

The ICT Investment plan provides a framework for delivering these strategic outcomes and closely aligns to Endeavour Energy's individual business strategic plans and business drivers. The six key investment areas of Safety Management; Deliver the Network Plan; Network Billing and Customer Management; Finance and Risk Management; Performance through People and IT Service Delivery are supported by the ICT strategic objectives to deliver the ICT programs contained therein.

The Endeavour Energy ICT Investment Plan which underpins the regulatory proposal for the 2015-2019 AER Submission has been established through a rigorous process which clearly recognised the need for capital investment constraints and as such proposes investment in key investment areas providing benefits directly linked to the organisations corporate objectives.

The submission details investment in application software and developments, infrastructure and operating systems and network communications and devices. It excludes investment in the operation of the electricity network such as infrastructure and devices that facilitate monitoring, control, protection and automation of the electrical grid which have been included in Endeavour Energy's Network 2015-2019 Regulatory Proposal. Endeavour Energy's ICT Investment Plan excludes specific ICT investment in the following network standard control and alternative control services:

- Investment in SCADA technologies and other network control systems are considered as operational technology and have been included in Endeavour Energy's Strategic Asset Management Plan (SAMP) and system capital expenditure programs in Chapter 5 of Endeavour Energy's 2015-2019 Regulatory Proposal and
- Investment in metering technologies such as Type 5 and Type 6 metering services is regarded as being integrated with the provision of metering services and technology investment in these installation types has been considered in Chapter 8 - Alternative Control Services (Metering Services) of Endeavour Energy's 2015-2019 Regulatory Proposal

The ICT Investment Plan is formulated on a principle which allows for long-term decision making and clarification between direction and priorities of the business. The ICT Investment Plan is required to identify, validate and present all key initiatives for funding allocation and clarification between the balance of demands of the business, ICT delivery capability, performance management and governance.

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There are four major categories to ICT Investment and each offers the business opportunities to achieve business value:

- Mandatory;
- Risk;
- Improve; and
- Strategic.

Mandatory

Investment in ICT is considered mandatory where the investment is essential to meet legislative or regulatory requirements. Initiatives categorised as mandatory include investment to meet AEMO and NECF requirements.

Risk

Investment in ICT provides a stable, scalable and supportable business platform with disaster recovery capability that delivers sustainable and reliable system and network performance in a cost effective manner in order to meet our obligations as a DNSP.

Included in the risk category are Information security initiatives and ICT asset investment initiatives such as capacity and license management which requires investment in servers, software licenses, communication bandwidth and storage to support organic and business transformational growth.

Throughout the AER period ongoing investment and effort is required across all platforms to maintain an acceptable performance level of business applications, manage the risk around supportability and the ability of acquiring competitive skills in the market place.

Improve

Investment in new applications, systems and devices used by the business is required to achieve its cost and risk outcomes. Investment in technological advancements is needed during the AER period to support and enable business initiatives to realise benefits in productivity and efficiency. Key opportunities include extending field force automation, elimination of manual processing and improving access to accurate data to support decision making in the field and in the office.

Strategic

This type of investment follows innovations and developments in the wider ICT industry and the increasing level of technical literacy of Endeavour Energy's customers, service providers and electricity consumers. Examples of investment in this area include:

- Online channels for transacting with customers, suppliers and other stakeholders;
- Social media opportunities exist in the areas of customer engagement for energy efficiency programs and outage communication. Social can also be used to improve collaboration among employees to improve internal processes;
- Predictive analytics providing real time quality data to support decision making to ensure reliability and safety of the Network; and
- Cloud technologies, both public and private cloud computing offers Endeavour the potential for operational efficiency and business agility through hosted solutions and shared service potential.

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ALIGNMENT TO GROUP AND CORPORATE STRATEGIC PLANS

Relationship to Networks NSW

On 1 July 2012, NNSW was formally created to implement organisational reforms initiated by the NSW State Government for NSW DNSPs. The particular focus of the reforms was to reduce the costs of the three Operating Companies (OpCos) by leveraging synergies in best practices, operating models, volume discounts in procurement and investment governance.

Across the three OpCos, there are significant differences in levels and types of ICT systems, technical currency and overlapping trials of smart grid technologies. This provides both barriers and opportunities to lower the cost of technology while maintaining network reliability and legislative compliance.

The future ownership of the three Networks NSW OpCos is yet to be determined. Potential privatisation suggests that a cautious approach to large scale and long term investment would be prudent. As such, major transformational initiatives and long term projects, such as systems consolidation across the 3 organisations, need to consider disengagement costs and appropriate payback periods. Whilst complete consolidation could be a viable long term plan if the companies were to be fully merged, it would be costly and involve a long time to achieve return on the investment. A more incremental approach has been adopted where possible opportunities for shared services, joint procurement and holistic sourcing are considered on a case by case basis. The investment spend across the three will focus on delivery of solutions that enable service improvements and cost benefits to the business and where leveraging the solution for one or more other OpCos is feasible and cost effective, this option will be preferred to implementing a separate and standalone system.

The NNSW Technology Strategic Plan is one of seven that support the Group Strategic Plan and provides the overall strategic direction for the three organisations. The purpose of the plan is to:

- **“LEVERAGE TECHNOLOGY** - Utilising technology to deliver business outcomes in the most effective and efficient way”;
- The primary role of the technology function at Endeavour is to provide:
 - Reliability, performance and security of Information, Telecommunication and where required integration of Operational/Grid Technologies;
 - Cost effective technologies and services to support the business objectives; and
 - Technologies to enable each Division to achieve their strategic objectives.

The NNSW Technology Strategic Plan gives a high level rationale for leveraging technology and investment to support the business objectives of enabling productivity and containing and reducing the technology cost base. With the ongoing convergence of the key elements of technology across industry, it is appropriate to recognise and align the following three key elements within the NNSW Technology Strategic Plan:

- Information Technology: all business and enterprise applications, hardware and storage, supporting devices, and the data and information within these systems;

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- Telecommunications: all systems and devices related to the provision of mobile and fixed telephony, field telecommunications and data transmission services; and
- Operational & Grid Technology: integration of systems and data stores to facilitate outage management and decision support for asset maintenance and network capital investment.

One of the NNSW Technology Strategic Plan focus areas is to “Exploit the Power of Three” as defined below.

Strategic Focus	Goals	Rationale
Exploit the Power of Three	Maximise scale benefits of the three companies and increase alignment	<ul style="list-style-type: none"> • To obtain increased discounts from suppliers by leveraging the combined volume of all three OpCos. • To improve the performance of key functions by using frameworks and skills in one OpCo compared to the others. • Minimise rework on similar policies and solutions by using previous work done by one of the OpCos.

This theme has been expanded into the following initiatives that will be jointly implemented with the target of saving over \$20 million in operational expenditure shared between the three OpCos over four years.

Exploit the Power of Three		
Initiative	Description	Timing
Joint Procurement	<ul style="list-style-type: none"> • Selectively implement joint procurement opportunities. Current focus on telecommunications carriage, printing and infrastructure outsourcing. 	FY15
Common cost and performance model to facilitate cost benchmarking of services.	<ul style="list-style-type: none"> • Undertake common service definition and develop an agreed cost allocation approach in order to compare granular cost benchmarks for similar services across all three OpCos. • Identify initiatives to address less cost effective services and underlying cost drivers. 	FY16
Common governance, security, delivery and architecture frameworks.	<ul style="list-style-type: none"> • Share existing policies, risk management plans and architectural roadmaps. For each update to existing arrangements, a peer review to be undertaken by other OpCos in order to align documents and achieve best practice across all three. 	FY17

Strategic Alignment

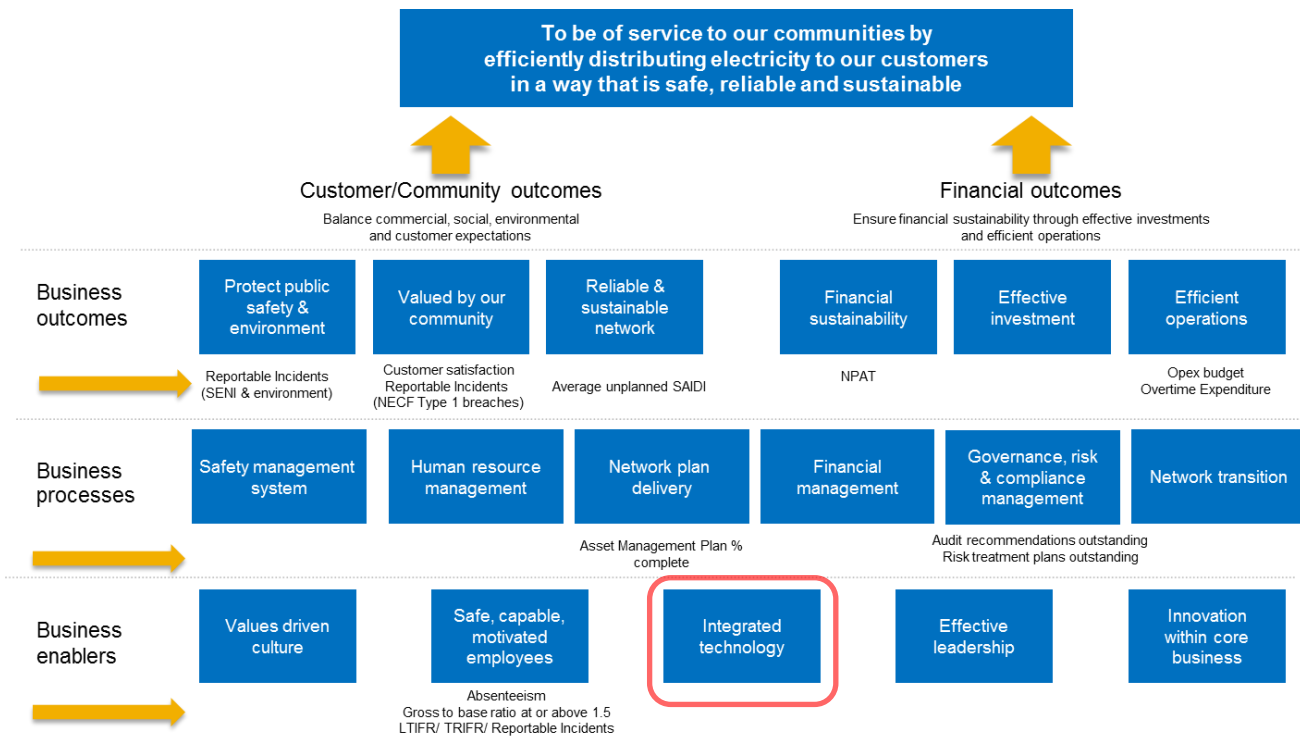
The corporate planning framework, as outlined in the 2014/15 NNSW Group Strategic Plan, takes a five-year view of the organisation’s strategic objectives and priorities and is updated annually. These strategies are designed to promote the long term interests of our customers, shareholders, people and communities by leveraging technology to:

- maintain financial performance and deliver on State Government expectations of the network reforms in response to downward pressure on future revenues;
- implement more productive business process changes and to support the efficient operation of blended delivery models;

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- provide new communication channels for customers to enable customer engagement and to allow consultation on aspects impacting customers and the community in the provision of supply and outage management; and
- adopt a prudent approach to project selection and total cost of ownership cost considerations to reflect a capital constrained environment.



The Group Strategy map provides the framework for determining the key financial and non-financial measures and targets in the Balanced Scorecard. It outlines and illustrates the linkages between key business outcomes and supporting business processes and enablers. These provide the framework for the Group Technology Strategic Plan.

Endeavour Energy's Business Plan and ICT Investment Plan have been developed to reflect the objectives of the Group Strategic Plan and Group Technology Strategic Plan.

To ensure these outcomes are delivered Endeavour Energy has established seven strategic plans:

- Improve our safety performance;
- Improve customer value;
- Deliver the network plan;
- Achieve the financial plan;
- Manage business risk;
- Deliver performance through people and
- Leverage technology.

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In order to support the delivery of NNSW and Endeavour Energy's objectives, Endeavour Energy's ICT Investment Plan has the following ICT strategic objectives:

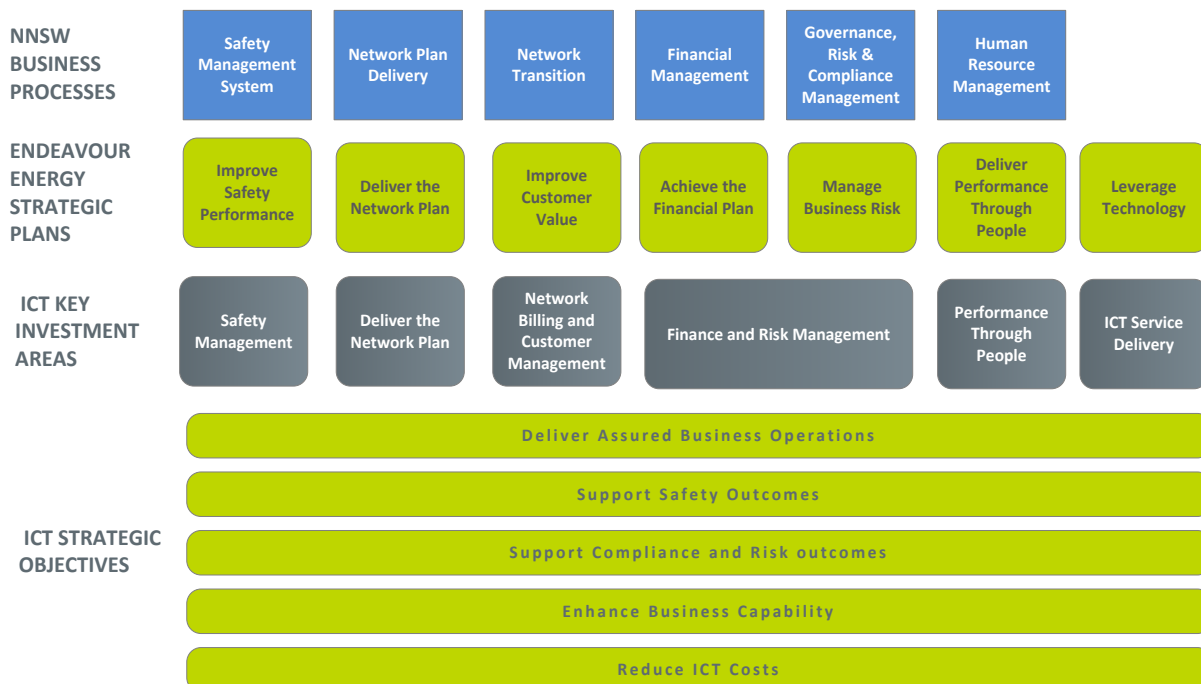
- Deliver assured business operations;
- Support safety outcomes;
- Support compliance and risk outcomes;
- Enhance business capability; and
- Reduce ICT costs.

These ICT strategic objectives are underpinned by the following ICT Key Investment Areas are as follows:

- Safety Management;
- Deliver the Network Plan;
- Network Billing and Customer Management;
- Finance and Risk Management;
- Performance through People; and
- IT Service Delivery.

Endeavour Energy's ICT Investment Plan supports the NNSW Group outcomes of efficient operations & effective investments through the enablers of integrated technology and innovation. The following map demonstrates Endeavour Energy's unique ICT delivery model and describes the alignment of Endeavour Energy's ICT Key Investment Areas and Strategic Objectives to NNSW Business Processes.

ALIGNMENT OF NNSW GROUP OBJECTIVES TO ENDEAVOUR BUSINESS AND ICT INVESTMENT PLAN



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The following table summarises the high level goals and associated major programs of Endeavour Energy's ICT Investment Plan Key Investment Areas.

Purpose		LEVERAGE TECHNOLOGY				
		Utilising technology to deliver business outcomes in the most effective and efficient way				
Key Investment Area	Safety Management	Deliver the Network Plan	Network Billing and Customer Management	Finance and Risk Management	Performance Through People	IT Service Delivery
GOALS	Invest in technology to educate, monitor and measure the achievement of safety objectives.	Invest in technology to create processes to allow management of reliability and greater use of smart grid technology to achieve lower capital and operating cost accounts.	Manage / replace legacy systems to support the high data volume processes and strict deadlines for delivery where non-compliance or lack of data accuracy and transparency may result in financial penalties and revenue loss for Endeavour Energy.	Invest in technology to facilitate sound commercial decisions, drive sustainability of operations and performance and to ensure risks, costs and prices are controlled and maintain a high level of compliance.	Automate manual processes, integrate data and systems for process performance improvement and enhanced performance reporting to increase our ability to respond to future requirements of the organisation.	Provide an assured business platform and support the delivery of corporate objectives cost effectively.
MAJOR PROGRAMS	Assured Business Operations Fatigue Management Safety Training Safety Systems Enhancements Safety Systems Technical Currency Program	Assured Business Operations Technical Currency Program Strategic Initiatives Network Asset Management Improve the business Process Automation and Mobile Crews	Assured Business Operations Network Billing Technical Currency Program Mandatory Customer Management and Compliance	Assured Business Operations Business Risk Technical Currency Program Decision Support Program Records Management Upgrade Digitalisation Program Improve the business Finance Automation Program	Assured Business Operations Employee Portal improvements Improve the business LMS – Process enhancements HR workflow, automation & collaboration Improvements to Automation of timesheets	Assured Business Operations IT Infrastructure Asset Management and Services IT Communications Asset Management and Services ICT Operational Services Information Security

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The forecast annual capital expenditure is summarised in the following table:

ICT Investment Plan	Forecast Annual Capital Expenditure (\$ Millions)					
	2015	2016	2017	2018	2019	Total
Safety Management						
Deliver the Network Plan						
Network Billing and Customer Management						
Finance and Risk Management						
Performance Through People						
IT Service Delivery						
Total						

Table 1: Forecast Annual Capital Expenditure

Note: Financials are adjusted to reflect standard control services only to align to AER allowance calculation

The forecast annual operating expenditure is summarised in the following table:

ICT Investment Plan	Forecast Annual Operating Expenditure (\$ Millions)					
	2015	2016	2017	2018	2019	Total
ICT Labour & Overheads						
IT Infrastructure & Applications Service						
Telecommunications						
Third Party Support Agreements						
Market Testing and Transition costs						
Project Delivery Operating Costs						
Miscellaneous Operations Activities						
Total Standard Control Services						

Table 2: Forecast Annual Operating Expenditure

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Note: Financials are adjusted to reflect standard control services only to align to AER allowance calculation

The ICT operating investment plan reflects and discusses forecast nominal values for standard control services only.

For completeness, the following table highlights total ICT operating expenditure forecast in nominal dollars and shows the total breakdown of forecast operating expenditure across standard control, alternate control and unregulated dollars.

ICT Investment Plan	Total Forecast Annual Operating Expenditure (\$ Millions)					
	2015	2016	2017	2018	2019	Total
Total Standard Control Services						
Total Alternate Control Services						
Total Unregulated						
TOTAL						

Table 3: Total Forecast ICT Operating Expenditure (including Standard, Alternate and Unregulated services)

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INVESTMENT CONTEXT

Industry and Business Context

Investment in Endeavour Energy systems over the next five years is required to deliver reliable and sustainable supply and to support compliance of business processes to meet regulatory and market requirements. The programs developed under the ICT Investment Plan must comply with the expenditure objectives and assessment criteria as set out in sections 6.5.6 and 6.5.7 of the National Electricity Rules (NER). ICT investment in capital and operating expenditure must:

- Meet or manage expected demand over the period;
- Comply with regulatory obligations;
- Maintain the quality, reliability and the security of the distribution system of the supply of standard service; and
- Maintain the safety of the distribution system through the supply of a standard control service.

Detailed alignment of the ICT Capital and Operating Investment plans against the NER objectives are included in the Capital Expenditure, Operating Expenditure and Key Investment sections of this document.

Endeavour is required to provide independent investment in technology to deliver corporate outcomes. As part of the Networks NSW group, Endeavour Energy considers investments within the context of “The Power of Three” wherever combined opportunities and savings may exist jointly within the context of the Group strategic plan.

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The major business drivers for utilising technology within Endeavour are:

Business Drivers	Description
Network Reform	<ul style="list-style-type: none"> Network reform is driving considerable change to the way the NSW electricity distribution industry operates. The reforms are designed to deliver a more efficient, lower cost electricity distribution service to customers whilst maintaining the reliability and safety of the network. Endeavour Energy's ICT Investment program takes a prudent and value driven approach to large scale and long term investment, ensuring that ICT contributes directly and indirectly to the delivery of cost and efficiency savings and the reduction in standard control costs. No major group ICT transformational initiatives and long term projects, such as systems consolidation across the three organisations have been included in the plan for the next five years. Where such opportunities do arise their value will be assessed against total cost of ownership and appropriate payback periods.
Network Only Business	<ul style="list-style-type: none"> Endeavour has successfully completed the TSA support with Origin in 2013. Systems that once provided synergies between the Retail and Network businesses are now inefficient and costly for a network only business. The focus for the next AER period is on streamlining systems to support simpler Network only business processes allowing the replacement of legacy systems and forging new relationship models with Retailers and end customers. An increase in investment in the systems and processes with a focus on customer self-service and improved information flows is required to fulfill NECF obligations.
Blended Delivery	<ul style="list-style-type: none"> Over the last AER period Endeavour has successfully used external contractors to supplement internal resources and plans to continue to exploit such opportunities to improve customer value over the next five years. This delivery model is driving increased investment to enhance the integration of business processes beyond Endeavour boundaries to enable efficient data transfer and monitoring/auditing of external contractor performance.
Regulatory	<p>AEMO</p> <ul style="list-style-type: none"> Endeavour Energy must comply with the regulations and licensing requirements of the Australian Energy Market Operator (AEMO). The core systems that support the critical business processes are over a decade old and carry the inherent risks of an ageing platform and potential hardware failure. Investment in systems and processes is required to ensure: <ul style="list-style-type: none"> Provision of appropriate metering equipment and associated devices to measure energy consumption and, where relevant, demand as required for billing and planning purposes; Management of collection, reconciliation and reporting of metering data, standing data and Network billing and revenue management. <p>NECF</p> <ul style="list-style-type: none"> In order to comply with NECF obligations Endeavour must make changes to our operating models, processes and systems to improve customer service. An increase in investment in systems and processes is required to: <ul style="list-style-type: none"> Maintain accurate customer and premise records; Deliver safe connections and disconnections of supply; Provide timely communications of planned and unplanned interruptions to supply; and Provide customers with access to information through cost effective communication channels. <p>LICENCE CONDITIONS</p> <ul style="list-style-type: none"> Performance and accountability for the operation of the network and delivery of supply and services to customers is based on network reliability. Increasingly, reliability indicators will be based on information collected from assets over their lifecycle and the ability to automate and analyse this for its economic and technical performance. The changes in the reliability licence conditions will have further impact in this area.
Market	<ul style="list-style-type: none"> Endeavour is experiencing a period of declining consumption. Whilst total consumption is declining peak demand remains high. These factors significantly impact network design which must have the ability to meet the needs of an evolving set of demographics (consumption patterns, location etc.), and products requiring bidirectional energy flows. This will require changes to measurement systems and the ability to control the network in new ways in order to provide a cost effective and reliable network. These systems may be the start of a general business model change where networks act more as a bi-directional energy trading platform rather than a single direction energy delivery system.

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Technology Industry Trends

A number of major technology trends have been identified that will impact on the utilities industry, and more widely, with many of them being a near term impact. Major technology transformations are impacting Endeavour, Networks NSW as a whole and its business partners, requiring strategic responses.

Industry Trend	Description
Network data	<ul style="list-style-type: none"> Endeavour will use 'smart devices' within the electrical grids to conduct more efficient and effective monitoring of network assets. Greater use and correlation of this data is required to support reduced capital investment in network infrastructure and timely decision making in areas such as network design, planning, maintenance and system operations. Manufacturers are increasingly offering equipment which includes advanced features (data collection, analysis and control) at minimal or low incremental cost. There will be increasing pressure to incorporate these features into the engineering processes to realise the value - this increases the emphasis on the data collection, analysis and communications platforms.
Information and Operational Technology	<ul style="list-style-type: none"> The increasing convergence of IT and operational technology is driving the need for IT investment in the integration of operational technology and information technology data to better understand the network's resilience to environmental impacts and improve the efficiency and effectiveness with which the network asset is operated.
Information & Cyber Security	<ul style="list-style-type: none"> Due to the increasing number of devices, the growing level of external and remote access to Endeavour Energy business information and the strong demand for interoperability, the security risks associated with managing operational and corporate information and devices are growing significantly. The need for increased access to information needs to be balanced by the increased risk of accidental or deliberate misuse of data or "high jacking" of network control systems. Providing secure architectures and networks is crucial to supporting Endeavour Energy's increasingly mobile and third party based workforce and is driving the necessity for investment in information and cyber security architectures, systems and processes.
Workforce Mobility	<ul style="list-style-type: none"> Increasingly Endeavour staff and our contract suppliers will use smart phones, tablets and notebooks which rely on ubiquitous telecommunications and 3/4G mobile networks to support collaboration between key stakeholders and process participants and to improve productivity in the field.
Telecommunication Technologies	<ul style="list-style-type: none"> The distributed nature of utility assets and the need for very high availability even during prolonged electricity outages makes a robust telecommunication network a high priority. The drive to be able to better observe and monitor the distribution network requires new solutions with higher bandwidth than traditional low speed SCADA networks. Telecommunications technologies have relatively short lifecycles compared to electrical network assets and these technologies are regularly refreshed as new technologies are developed and deployed, thus necessitating the use of appropriate delivery models to ensure the right balance of functionality and cost is maintained.
Disruptive Technologies	<ul style="list-style-type: none"> Customers are increasingly investing in new technologies as alternate means of energy supply. In recent years there has been a significant growth in solar connections, and it is expected that battery storage systems will soon be linked to solar installations to maximise the value and benefit of solar generation as energy storage prices decrease. The use of electric vehicles is another new technology that may become a viable alternative in the near future. All these technologies have the potential to significantly impact the reliability of the network and degrade power quality. This requires investment in network technologies to manage the changing electricity network and stabilise the increasing cost of network operation.
Cloud Services	<ul style="list-style-type: none"> Cloud services are not new, but converging forces of commoditisation, with lower unit pricing, skills specialisation and increasing telecommunications capability means that organisations are no longer bound to host all their data and systems on their own infrastructure. There are commensurate security, integration and privacy issues to be managed. In the case of utilities with a traditional preference for capital rather than operational expenditure, the agility provided by a transition to cloud-based infrastructure, software and data systems will bring opportunities for OPEX based pay-as-you-go models with budget impacts and challenges.

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Big Data Analytics	<ul style="list-style-type: none">Powerful new approaches will be further developed to visualise, correlate and analyse the large sets of data produced by grid technologies and enterprise systems, all which need sustainable and cost effective management.
Outsourcing	<ul style="list-style-type: none">Selecting the appropriate delivery model (internal, outsourced, offshore) adds additional complexity and risk to technology programs and requires additional skill sets within the operating models but does introduce additional flexibility and potential cost savings.
Social Media/Web 2.0	<ul style="list-style-type: none">Social media presents new opportunities for powerful consumer engagement channels that can be used both to drive customer participation in energy efficiency programs and also enhance outage communication capabilities. However, many of these emerging trends are relatively untested within Endeavour Energy and are likely to present new technology challenges. In addition, not all social media is positive (or within the control of the organisation) and the need to monitor and influence community sentiment via social media is likely to influence ICT technology programs in the short to medium term.

Strategic Challenges

The strategic technology challenges arising from the industry, business and cultural contexts that guide the ICT investment plan are:

- **Downward pressure on future revenues** requires significant focus on productivity improvement to maintain financial performance and deliver on State Government expectations of the network reforms. In particular, the increasing use of solar PV and the emergence of cost competitive electricity storage solutions mean that revenue pressures will also increase and a business response. The response is likely to involve transformational use of smart grid technologies and new cost reflective tariff models;
- **Productivity improvements** will require implementation of substantial labour cost reforms and changes in delivery models including market testing of some services. Implementation of the reform agenda is set against uncertainty in respect of future ownership, change resistant cultures and industrial stakeholders, and varying levels of maturity in leadership performance and organisational change capability. Information Technologies will provide opportunities to implement more productive business process changes and to support the efficient operation of blended delivery models;
- **A new model for customer engagement** is required to operate as a “network only” business and to comply with NECF obligations. The new model must be able to collect and maintain accurate data on customers and retailers and communicate outages and restoration times, especially to vulnerable consumers on life support. The model must be able to provide new communication channels for customers to enable customer engagement and to allow consultation on aspects impacting customers and the community in the provision of supply and outage management; and
- **A need for constrained capital expenditure** due to unsustainable debt levels and reflecting potentially lower credit ratings for the businesses. This in turn leads to a more difficult investment period ahead for technology investment and will require a prudent approach to project selection. Consideration must be given to the priorities of the organisation; options available within the market; buy/build vs. service solutions and associated total cost of ownership.

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PERFORMANCE IN THE 2009-2014 AER PERIOD

Overview

Endeavour Energy's forecast result for the 2009-2014 regulatory period reflects an under-spend of capital funds of \$24.5 million (21%)³ and an over spend of operating expenditure of \$31.1 million (18%) over the five year determination period.

The following five principles guided the ICT investment strategy and the forecasted capital and operating expenditures for the 2009-2014 AER regulatory submission:

- Ensure alignment between the direction and priorities of the business and ICT;
- Ensure the process for delivering those priorities is in place and delivering;
- Clarify the balance between the demands of the business, ICT delivery capability, performance management and governance;
- Establish a basis for the ongoing management of information and communications technology assets within Integral (now Endeavour); and
- Provide an overall context for making key decisions within a long-term direction.

The variations to the forecasted capital and operational expenditure for ICT reflect the success of the application of these principles. The alignment to business priorities is reflected in the need for significant investment to reduce safety risk and ensure our system was operating to the standard required under our licence conditions. The 2009-2014 ICT AER regulatory submission highlighted the need for significant investment in the Billing and Customer Management, Meter Information/Market Operations and Integrated Asset Information Management systems portfolios. The reduced capital expenditure reflected the substantial changes generated by the sale of the retail business, the creation of Endeavour Energy as a DNSP only business and industry reform that created Networks NSW.

In response to Network Reform, there was a corporate imperative to reduce the level of capital investment, to contribute to a \$22 million reduction in operating cost and to facilitate the achievement of these objectives for other Divisions within Endeavour. The resulting initiatives were encapsulated under the two projects of Challenge (operational cost savings in non-Network business) and Compete (regional and network operational cost savings).

Project Challenge and Project Compete resulted in a realignment of priorities for ICT expenditure. The focus of ICT capital expenditure was shifted to ensure capital investment aligned with the priorities of the business and would result in long term operating expenditure reductions whilst allowing for "Business As Usual" by providing an assured business platform. ICT contributed directly to Project Challenge by introducing a strategic sourcing strategy, renegotiating support contracts with Optus and CGI and decommissioning retail applications in order to offset increases in other areas. These initiatives provided significant

³ Based on Q2/2014 capital forecast

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outcomes for the organisation with initial annualised savings of \$11.6 million⁴, with the principles applied to achieve these savings being continued into future financial years.

Through the annual technology capital investment process, ICT has been able to work effectively with the business to align scarce investment funds to the priorities of the business and drive high returns for the funds invested. ICT have been effective in balancing the demands of the business against ICT delivery capability, performance management and governance. This is clearly reflected in the substitution of capital for operational expenditure to deliver a better total cost of ownership shared services solution to replace high risk legacy applications and infrastructure for market operations.

A key outcome achieved in this AER period is the adoption of total cost of ownership approach to assess investment options. This approach aims to deliver cost effective current operations as well as provide opportunities for continued cost savings or cost avoidance in the longer term. This is achieved through the technology selection of commoditised hardware and establishing best in class, best value multi-vendor outsourcing models to deliver support and future capability requirements.

The following sections detail our capital and operating expenditure performance against forecast for the 2009-2014 AER regulatory period.

Capital Expenditure Performance

Endeavour Energy's forecast capital expenditure for the period 2009–2014⁵ was \$93.5 million which was approximately \$24.5 million (21%) below the AER submission forecast of \$118.8 million, due primarily to the deferment of capital programmes of work.

There has been some realignment during the current AER period to reflect changes to a network only business operating within the network NSW framework. The transitioning of the Retail business to Origin Energy and related ICT expenditure was completed in January 2013. The table below shows the link from the investment areas in the current AER period to the investment areas used for AER 2015-2019 submissions:

AER 2009-2014	AER 2015-2019
Integrated Asset Information Systems	Deliver the Network Plan
Meter Information and Market Operations	Network Billing and Customer Engagement
Billing and Customer Management	Network Billing and Customer Engagement
Knowledge Management	Finance and Risk Management
Infrastructure and Enterprise Architecture	IT Service Delivery
Corporate Systems	Safety Management Performance Through People Finance and Risk Management

⁴ In nominal dollars, based on 11/12 Budget

⁵ Based on Q2 2014 Forecast

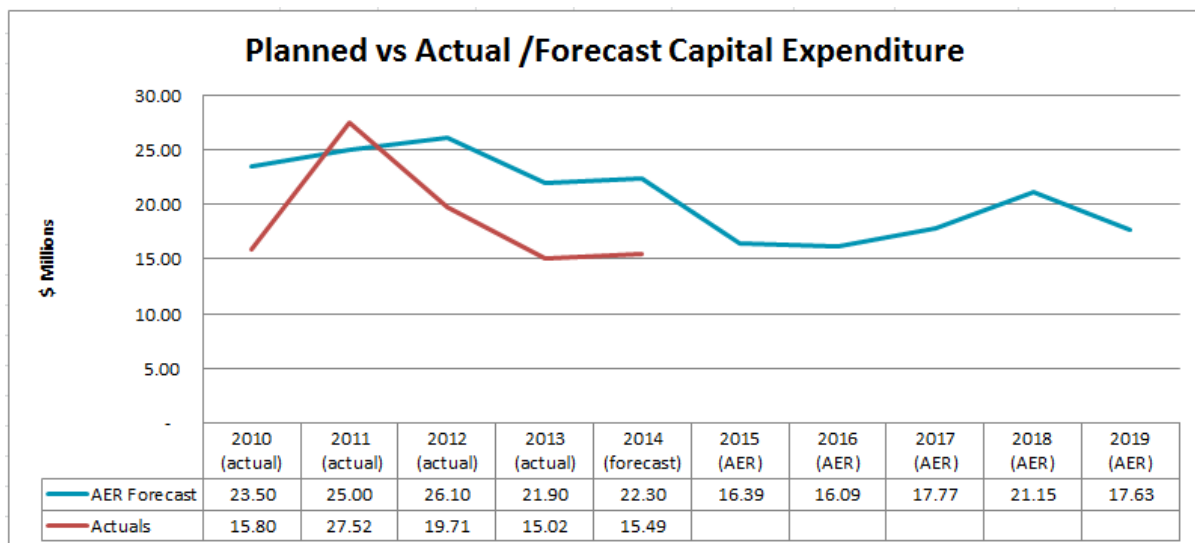
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The following table shows major initiatives which Endeavour elected not to undertake, deferred or partially completed to deliver the best outcomes for our customers and shareholders. Key factors impacting capital investment decision included changes in business priority, focus on reducing capital investment, reform implications and risk mitigation.

Investment Area	Initiative	Rationale for No investment /Deferral/ Partial implementation
Billing and Customer Management	<ul style="list-style-type: none"> Upgrading of meter data management system. The program of "Auditability of Data Management Process. Phasing out of Banner and implementation of new network billing. Redesign and implement network billing. 	<ul style="list-style-type: none"> Change in Business strategy around smart metering. Banner replacement and network billing programs deferred to completion of industry restructure activities.
ICT Assured Business Platform	<ul style="list-style-type: none"> Intel Server system refresh. 	<ul style="list-style-type: none"> Deferred due to Industry restructure.
IAIMS	<ul style="list-style-type: none"> Distribution management system development and integration. 	<ul style="list-style-type: none"> Deferred pending completion of SCADA Upgrade, Historian projects and implementation of an Electronic Pin Board.
Knowledge Management	<ul style="list-style-type: none"> Implementation of Intranet Redevelopment Strategy including Enterprise portal and Management. Information and Document Management. 	<ul style="list-style-type: none"> The work was limited to technical upgrade because of changing business priority and was undertaken to address compliance requirements and risk. Project Compete resulted in a deferral of mobility style projects due to marketing for outsourcing the asset management field processes.

The actual and forecast capital expenditure for the last AER determination period and the forecast annual capital expenditure for the coming AER determination period are shown on an annual basis in the following diagram:



Note: Financials are adjusted to reflect standard control services to align to AER allowance calculation.

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Factors Influencing Capital Expenditure Performance

The key business drivers that have influenced the level and direction of investment and operating expenditure in technology resulted in our technology environment and capability for the AER period 2009-2014 were:

- Regulatory and legislative obligations;
- Transition Service Agreement with Origin Energy;
- Network Only Business;
- Uncertainty of SMART Metering and Metering business model;
- Industry Restructure – establishment of Networks NSW;
- Focus on cost reduction and delivering customer value and
- Low risk approach to provision IT services for critical business outcomes and systems.

The impact of each business driver is detailed below.

Regulatory and legislative obligations

Changes to obligations or the introduction of new obligations impacted the need for capital investment to enhance existing systems and functionality. Changes included:

- Obligations under the Electricity Supply Act 1995 (NSW) and the DNSP's operating licence;
- Obligations under the National Electricity Law and National Electricity Rules;
- General legal obligations that have specific impacts on the electricity industry such as Work Health and Safety obligations; and
- Governance and financial obligations as a State Owned Corporation.

Transition Service Agreement with Origin Energy

The transitioning of the Retail business to Origin Energy was completed in January 2013. This resulted in changes to the technology investment in three key areas:

1. **Billing and Customer Management** - At the time of the 2009-2014 AER submission the Endeavour Energy billing system was shared between both the Retail and Network business units. Planned expenditure included a number of projects to support the simplification of the billing system functionality pending the final decision on retail separation and the resulting direction for a billing system replacement. The capital allocation proposed provided for the network replacement component of a combined retail/network billing system or the provision of a network only billing.

The actual capital expenditure (including forecast for 2013/14) was \$5.8 million compared to a planned expenditure of \$10.3 million. The lower spend than forecast was largely due to not undertaking the Banner replacement, offset by making system changes needed to support transitional services as a result of retail separation and the sale of the retail business expenditure. A number of system improvements were required to meet regulatory requirements, including the implementation of a solar bonus scheme and medical rebate scheme.

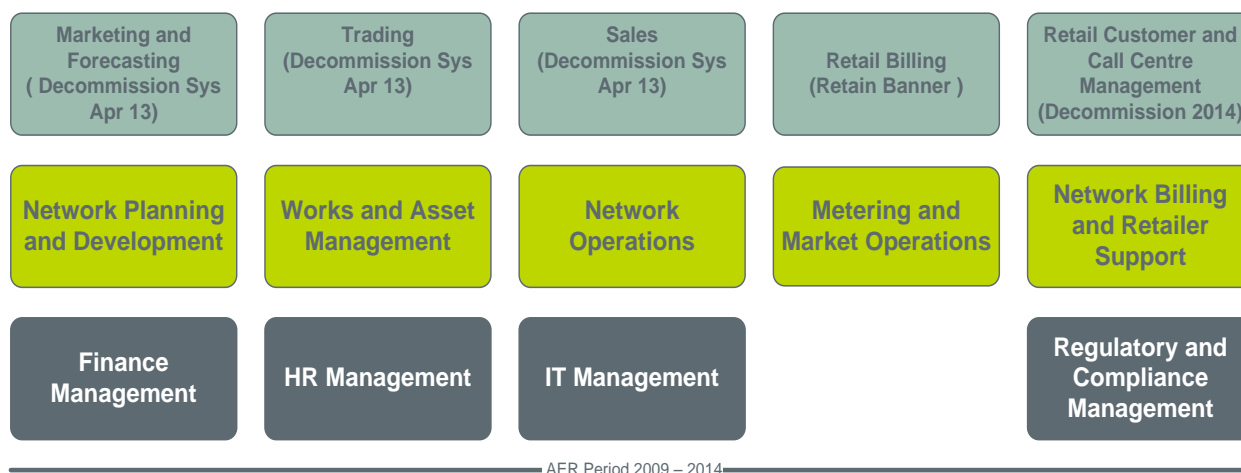
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- Metering Operations** - The key investment in this area for the 2009-2014 AER period included the replacement of the existing customer transfers system as a foundation for a more richly functional connection point management system that could scale to meet future demands of both a separated retail environment and a smart metering initiative, replacement of the meter data management system and the business process improvements.

To ensure Endeavour was able to meet its regulatory obligations as a DNSP to supply metering and customer data to the market, a prudent approach to investment spend was taken. Only where critical processes could not be generated on existing infrastructure and systems, technology investment was undertaken. In assessing operations outsourcing and shared services were considered to deliver the best value outcome. As a result, the actual capital expenditure (including forecast for 2013/14) was \$11.2 million compared to a planned expenditure of \$19.2 million.

- Network Only Business Transition** - The sale of retail and transition to a Network only business provided Endeavour with the opportunity to move to a much simpler customer engagement product portfolio and optimised business model that leverages existing technology and utilises highly automated processes with any unnecessary retail elements stripped away as depicted in the figure below.



AER Period 2009 – 2014

The initiatives targeted to transform to a network-only business in 2012/13 plan focused on critical business as usual functionality and capability. ICT worked successfully with the business to complete the transition of retail data and systems to Origin Energy and to decommission retail specific systems.

Systems that historically have had a role both in the network distribution and retail business areas remained in situ for much of the current AER period. These systems tend to keep existing processes locked to the legacy technology, incur higher costs in terms of operational support, represent an increased risk to BAU operations and are tightly coupled to legacy infrastructure.

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Since 2013, the focus for ICT was to work with the business to complete the transformation to a cost effective Networks Only business. During the last year of this determination period and into the next AER period investment will be required to consolidate and migrate, decommission and retire systems that are tightly linked to the retail business and to leverage opportunities to streamline processes and data flows to drive efficiencies and improve data quality. The core corporate systems are all within a major upgrade of technical currency. The challenges here are to maintain their currency, availability and supportability while being subject to industry reform.

Uncertainty of SMART Metering and Metering Business Model

Prior to 2008, metering and market operations processes were being supported by a number of legacy systems and environments which were considered end of life and required replacement.

Planned Technology initiatives in Meter Information and Market Operations were delayed due to the uncertainty of the SMART Meter roll out in NSW and future service delivery model for metering within Endeavour and Networks NSW.

The forecast projects that were completed, including the replacement of the existing customer transfers system and the implementation of a replacement Metering Business System (MBS), through a Shared Services model with Ausgrid. The nemSTAR database was upgraded to Oracle 10G to address legacy issues and maintain technical currency. Other projects in the area of regulatory audit and compliance were also achieved. Endeavour Energy completed pilot projects associated with smart metering infrastructure but these were not fully executed following a change in metering strategy. The implementation of the Data Management Program of works was not fully implemented due to the impact of retail separation.

Network Reform

On 1 July 2012, NNSW was formally created to implement organisational reforms initiated by the NSW State Government for NSW DNSPs. The particular focus of the reforms was to reduce the costs of the three Operating Companies (OpCos) by leveraging synergies in best practices, operating models, volume discounts in procurement and investment governance.

Endeavour Energy's Intel Server refresh and data centre program was deferred until a combined sourcing and procurement strategy and program of work between the three OpCos could be investigated. This was initiated in financial year 2014.

Focus on cost reduction and delivering customer value

The focus on cost reduction and delivering customer value particularly impacted the investment areas of Integrated Asset Information Systems - Network Program and Corporate:

- **Integrated Asset Information Systems - Network Program** - Endeavour Energy commenced its integrated asset information management strategy (IAIMS) program of works in 2000 to support distribution network programs. A GIS system, an ERP based asset information and work management system and an Outage Management System had been completed prior to 2008. The remaining components of the IAIMS program including the provision of field force automation and a distribution management system were planned for completion during the 2009-2014 AER period.

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The actual capital expenditure (including forecast for 2013/14) was \$29.7 million compared to a planned expenditure of \$37.7 million. The main achievements were the completion of the field force automation project to improve the productivity of Emergency Field Officers by allowing the real time dispatch and closure of jobs thereby improving the accuracy of data within our asset management and outage management systems. Expenditure was also made on a switching management system which integrates into the Outage Management System (OMS) as well as a stand-alone feeder automation system and control system. An Electronic Pin Board project was piloted to move from paper maps to automated systems to further improve operational and safety management of field work maintenance. The move to production has been delayed pending the completion of the upgrade to the hardware supporting the outage management application suite to a high availability platform (completed in 2013) and application upgrade from version 2005 to current version which will complete in 2014.

Additional achievements included implementation of the Project Portfolio Management System (PPMS), replacement of the Customer Application Program (CAP), an upgrade to GIS to maintain technical currency and improvements to the PABX system. The planned distribution management system was not completed as a suitable off-the shelf system that would easily integrate with our function rich OMS was not available. Therefore a more cautious approach was taken by implementing new functionality incrementally. This included implementation of enhancements to the Switch IT and Request IT systems, lightning tracking and process automation improvements.

- **Corporate** - Forecast expenditure in the corporate portfolio focussed on knowledge management, corporate support and safety investment.

Knowledge Management - The knowledge management area was focused on three areas: reporting, the web and document management. Completed projects in the knowledge management area included upgrades to systems and applications to maintain technical currency, such as an upgrade to Cognos Reporting & Analytics, improvement projects such as the implementation of an HR Data Mart and Asset Management Data Mart, Maintenance Data Mart and technical upgrades to the document management system. The actual capital expenditure (including forecast for 2013/14) was \$9.9 million compared to a planned expenditure of \$14.2 million. The main reason for this variation was that some projects were not expected to deliver the required business benefits and were therefore cancelled.

Corporate Support - The projects undertaken in the corporate support area were focussed on:

- Upgrade of the existing ERP system (Ellipse) to the latest version;
- Process redesign and improvement projects including HR Reporting to reduce manual collation of reports; and
- e-Recruitment, employee/contractor on-boarding to provide internet/intranet presence to increase candidate pool and remove paper and provide tracking of key events in the process.

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The actual capital expenditure (including forecast for 2013/14) was \$12.4 million compared to a planned expenditure of \$6.7 million. The additional expenditure was as a result of the provision of additional functionality/scope and complexity of the ERP upgrade. Functionality improvements for the business were in areas of payroll automation, web time-sheets, higher duties workflows, enhanced employee self-serve capabilities. The upgrade also provided capabilities for future business process improvement namely automated training nominations and approvals, risk and condition based maintenance scheduling and enhanced work scheduling.

Safety Investment - New projects were undertaken in the Safety Investment Program and were focussed on the replacement of the paper based Worker Compensation process to a functionally rich system and the implementation of the safety management system, MySafe, which consolidated 13 incident recording systems and manual processes into a single system.

Low cost approach to provision of ICT services

Whilst a low cost and risk approach to the provision of IT services for critical business outcomes and systems was evident in the delivery of all programs of work, the impact was best demonstrated in Infrastructure and Enterprise Architecture Program.

The planned expenditure for the AER determination 2009–2014 was primarily to provide the underlying computing capability to deliver the business system initiatives. Expenditure in the infrastructure area was focussed on supporting the growth in data storage and processing and the ongoing lifecycle management of over 150 servers. It also included improvements to communications capabilities for voice and data. The program of work also included improvements to the disaster recovery (DR) platform for all systems and the information security program. Planned expenditure in the Enterprise Architecture area aims to provide the framework for delivery of future business processes which increasingly rely upon integrated interfaces between applications and data repositories.

Investment of major computing infrastructure upgrades was delayed due to the uncertainty in the NSW energy industry regarding the possible restructure and/or sale of electricity assets. Tactical investment was made to meet the requirement of delivering an assured platform for business applications.

The actual capital expenditure (including forecast for 2013/14) was \$27.3 million compared to a planned expenditure of \$29 million. Achievements included upgrade to the SAN server providing additional storage capacity and functionality which was achieved below forecast costs due to a large reduction (50% lower) in the price of storage. Improvements were also made to the mid-range architecture and upgrades to the AD environment. In the field of voice and communications improvements were made to the WAN and the corporate microwave network, and some major projects such as unified messaging, video conferencing, stand-by and call out monitoring system, voice recognition and IVR, IP intercoms were made.

The data centres have been historically classified as active/passive production and DR environments. The Glendenning data centre has provided development and test platform services with some capacity to support disaster recovery. Some production services such as

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VPN and email delivered via the Glendenning data centre in order to gain better use and distribution of IT assets.

In response to clarity of the ongoing operation of Endeavour as a DNSP with responsibility for its own ICT function, at the end of the 2009-2014 regulatory period, a program was initiated to refresh all data centre computing and storage infrastructure. This program will run well into the 2015-2019 regulatory period.

To ensure current operations maintain our service obligations and deliver the infrastructure to improve productivity through mobile field services, a major upgrade of the corporate LAN network infrastructure was completed in 2012/13 financial year. The upgrade was undertaken due to the end of life milestones for LAN devices. The refresh program re-aligned the network architecture to be in line with the then current industry best practice.

Operating Expenditure Performance

Endeavour Energy's forecast operating expenditure for the period 2009–2014 was \$199.6 million which was approximately \$31.1 million (18%) over the AER submission forecast of \$168.8 million.

The key areas of operating expenditure for the 2009-2014 AER period were:

- Service provider support of infrastructure and applications;
- Service provider support of telecommunications infrastructure;
- Labour and contract resource costs; and
- Telecommunications third party support agreements.

The operating expenditure outcomes of the first three years of this current AER period reflect our focus on delivering on the approved expenditure programs.

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The actual and projected savings achieved within 2009-2014 are shown in the table below.

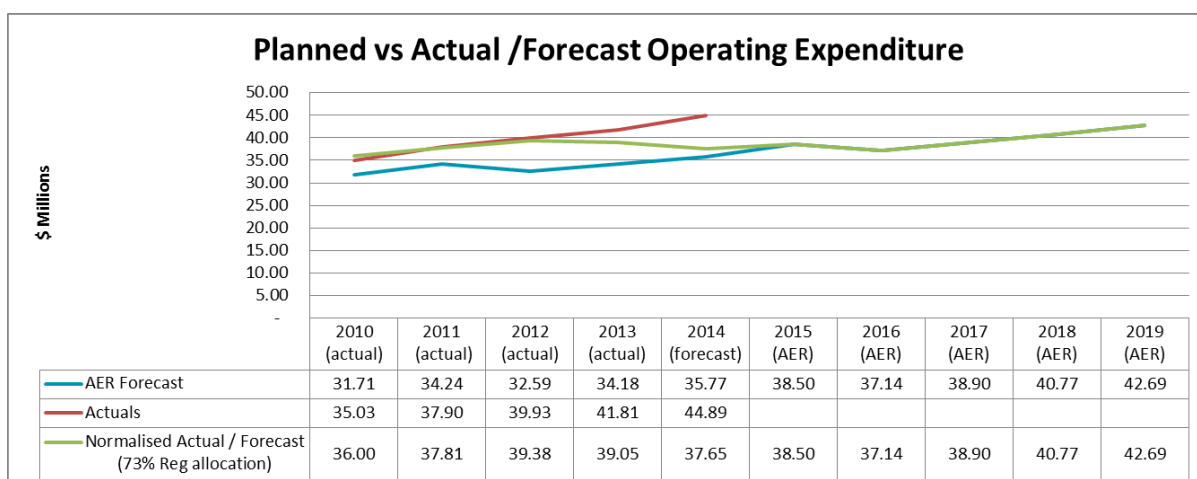
Cost Reduction Areas \$ Millions	2011 (actual)	2012 (actual)	2013 (actual)	2014 (forecast)	Total
Application & Licence Rationalisation	0.12	0.68	0.75	1.34	2.89
Labour Savings		0.12	0.27	0.10	0.49
Contract Negotiation	0.01	0.02	0.52	3.43	3.98
Miscellaneous IT Services	2.08	0.11	0.40	0.01	2.60
Total	2.21	0.93	1.94	4.88	9.96

Table4: Actual and projected savings 2009-2014 (regulated nominal \$)

The actual and forecast expenditure for the last AER determination period and the forecast annual operating expenditure for the coming AER determination period are shown on an annual basis in the chart below.

The green trend line represents normalised expenditure for actual and forecast using the regulated allocation of 72% in the 2015-2019 AER period to reflect how the costs are trending. This demonstrates Endeavour has actively managed operating expenditure against increasing business demand in services.

The significant reduction from \$44.89 million in the current AER period to \$38.50 million in the next AER period can be explained by the increased percentage allocation for standard control over the 2012/13 and 2013/14 financial years, due to transition of retail business to Origin Energy. The impact of this was \$11.2 million, with a further \$1.0 million relating to the previous three years. Normalised figures have been plotted against actuals and forecast to illustrate the impact of this allocation adjustment for next period.



Note: Financials are adjusted to reflect standard control services to align to AER allowance calculation.

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Factors Influencing Operational Expenditure Performance

Drivers for Increased Operating Expenditure

The initial AER forecast for 2009/10 has proven to be significantly lower than actual operating expenditure and the cumulative effect of this \$4 million shortfall in 2009/10 financial year has resulted in continued deviation in comparison of actual to forecast throughout the 2009-2014 AER period. The base year of 2008/09 was deemed to be suitable for forecasting operating expenditure in the preparation of the last AER determination as it represented the historical spend trends of previous years. However, the 2009/10 forecast compared to base year failed to take into account the following:

- Additional licence and support costs for new applications commencing in the 2009/10 financial year resulting from an increased capital expenditure program in 2008/09
- Increased costs of WAN radio network services to ensure improved network performance at depots
- Increased costs of volume based licences, desktop and usage charges required to support increased network business FTE's resulting from peak resourcing

These unanticipated deviations from the base year created a permanent step change from the first year of the determination period.

Endeavour Energy's actual operating expenditure for the period 2009–2014 was \$199.6 million which was approximately \$31.1 million (18%) above forecast; this was primarily due to the following factors:

- **An increase in percentage allocation** for standard control over the 2012/13 (78%) and 2013/14 (87%) financial years due to transition of retail business to Origin Energy. The impact of this as compared to the previous three year average of 73% was \$11.2 million, with a further \$1.0 million relating to previous three years. This has been adjusted down to reflect metering types 5 and 6 and ancillary network services being removed from standard control from the 2014/15 financial year onwards.
- **One off costs** were incurred in 2009/10 and 2010/11 to achieve transition to a new blended delivery model with our outsourced service provider. The outcome of the blended delivery model has been to contain anticipated increases in the support costs of existing applications by introducing new blended rates.
- **Increased cost of outsourced application support** over the years 2009-2013. The key growth driver for this increase has been the capital program through the introduction and transition of new solutions including Outage Management System, Figtree Workers Compensation, Identity Management and MySafe. A changed application support structure for key applications such as GIS, FIS, Ellipse, nemSTAR and the Intranet has also contributed to this increase as costs have shifted from internal labour to external vendors. These costs have been partially offset through reduced support costs realised in the last two years of the AER period through decommissioning retail applications no longer

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required upon completion of the TSA. Further offsets will be achieved through strategic sourcing initiatives where the benefits will be realised from 2014/15 onwards;

- **Increased cost of Third Party support agreements** has been required to support business as usual operations such as additional support costs for Oracle and MS Premier for new capabilities introduced during the AER period. A key contributor to this increase in the current determination period was the purchase of MBS (Metering Business Services) services from Ausgrid to replace Endeavour Energy's Customer Transfer System;
- **Higher labour costs** resulting from lower than forecast labour capitalisation on projects due to changed project delivery model; a slowdown in capital project delivery awaiting the results of industry reform and the transfer of business IT support staff into the ICT division which were not previously included in the ICT forecast submitted to the AER;
- **Increased cost of Telecommunication services.** The increased costs are due to:
 - Increased management and maintenance cost for Radio Network Services resulting from increased output from the Network Communications Capital Program beyond the 2008/09 base year forecasts. An increase in the number of optical line isolator units installed and additional microwave links required to support SCADA has resulted in additional maintenance and management fees of approximately \$400k per annum. These costs are funded by the ICT operating expenditure budget; and
 - Higher than 2008/09 base year costs for carriage and dedicated lines. The increased costs for dedicated lines has eventuated from the need to increase the capacity of existing data links and the provision of new data services between depots and the head office location to cater for the growth in data volumes being transferred between the locations.

Increases in telecommunication services have been partially offset through reduction of corporate telecommunication support costs negotiated in late 2012/13 which will provide an annual saving of \$900k, with further baseline reductions expected to be achieved through market test activities.

- **Increase in operating project expenditure** required in 2012 and 2013 as a result of:
 - Change in project delivery model to undertake additional process re-engineering activities in Phase 1 of major projects to ensure more effective and efficient capital investment
 - Engagement of external vendors for change management and training activities undertaken for major projects; and
 - The need to undertake significant data cleansing on key migration projects
- **Deferral of Capital investment** in computing infrastructure upgrades due to the uncertainty in the NSW energy industry regarding the possible restructure and/or sale of electricity assets impacted the expected flow on effects in reducing operating expenditure. Tactical investment was made to meet the requirement of delivering an assured platform

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for business applications, however, strategic investment with the objectives of reducing ongoing support and licence costs were deferred and the forecast operating cost savings were not achieved. This is evident in the deferment of the data centre computing and storage infrastructure refresh program which commenced in 2013/14 and will continue well into the 2015-2019 regulatory period.

Despite these factors, Endeavour Energy has actively managed operating expenditure against increasing business demand in services and the overall trend, taking into account the standard control allocation variances, is relatively flat.

Initiatives for Reduced Operating Expenditure

During the current AER period Endeavour Energy has focussed on reducing ICT operating expenditure to contribute to the corporate goals of network tariff control by undertaking the following activities:

The Network Reform Program and Project Challenge identified operational improvements within ICT and this has resulted in one-off or ongoing savings and deferred or avoided costs. The initiatives delivered \$10 million (nominal)⁶ in operating expenditure savings this period and are forecast to deliver \$1.5 million (nominal) for the next regulatory period.

Project Challenge initiatives reflect ICT Division's contribution to Endeavour's goal of continuously seeking efficiency savings and results in maintaining average distribution network prices for our customers to CPI (or less) over the next five years.

- **Implementing a broader multi-vendor outsourced model** to drive costs reductions and improve quality of support through the engagement of specialist vendors for specific technology stacks. This model is expected to deliver savings of 10-15% per annum on infrastructure and application and telecommunications support costs;
- **Renegotiating existing outsourced contracts** to reduce costs. Current market testing activities have confirmed that significant savings can be made in this area;
- **Rationalising and decommissioning** hardware and application to reduce costs including those used to support retail functions; and
- **Leveraging the power of three** OpCOs to secure cost effective services.

Active management of operating expenditure against increasing business demand in services through the above initiatives, taking into account the variance in the standard allocation percentage, has resulted in a relatively flat operating expenditure trend line.

These activities will continue into the next AER period and their effectiveness will be monitored and measured through completion of the market testing process, continued benchmarking and

⁶ Total regulated savings

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revising contractual coverage to ensure that outsourced services and shared services continue to provide value for money.

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INTRODUCTION TO THE ICT INVESTMENT PLAN

Endeavour Energy’s proposal for ICT expenditure is required to maintain and improve infrastructure, systems functionality and ICT services needed to deliver Endeavour Energy’s strategic outcomes of:

- Continuously improving safety performance;
- Maintaining the reliability and sustainability of the network;
- Containing average distribution network tariff increases to CPI for our customers; and
- Delivering consistent results to our stakeholder, the NSW Government.

The objective of the ICT Investment Plan is to create opportunities for Endeavour Energy to deliver value to customers, stakeholders and the community and to meet the following objectives to:

- Deliver assured business operations;
- Support safety outcomes;
- Support compliance and risk outcomes;
- Enhance business capability; and
- Reduce ICT costs.

The ICT Investment plan provides a framework for delivering these strategic outcomes and closely aligns to Endeavour Energy’s individual business strategic plans and business drivers. The six key investment areas of Safety Management; Deliver the Network Plan; Network Billing and Customer Management; Finance and Risk Management; Performance through People and IT Service Delivery are supported by the ICT strategic objectives to deliver the ICT programs contained therein.

The following diagram shows the alignment between the key investment areas and the ICT strategic objectives.



Figure 1: Alignment between ICT Key Investment Areas and ICT Strategic Objectives

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The table below shows the ICT strategic objectives and measures that will be used to measure the effectiveness of the forecasted expenditure in generating value for Endeavour Energy, its shareholders and its customers.

ICT Strategic Objectives	Business Drivers	Measures
Deliver Assured Business Operations	<ul style="list-style-type: none"> Investment in infrastructure and application upgrades as per vendor and risk compliance requirements 	<ul style="list-style-type: none"> Average User Minutes Lost (AUML) Frequency of Severity 1 and Severity 2
Support safety outcomes	<ul style="list-style-type: none"> Solutions to support fatigue management and drug and alcohol training and testing are required as well as mobile solutions to provide safety information and tools to the field. 	<ul style="list-style-type: none"> Compliance to Corporate Safety Targets.
Support compliance and risk outcomes	<ul style="list-style-type: none"> Investment in systems, functionality and processes to facilitate compliance to regulatory obligations. 	<ul style="list-style-type: none"> Internal and External Audits Fines for non-compliance. Breaches of legislation e.g. Privacy Act, Heavy Vehicle national laws.
Enhance business capability	<ul style="list-style-type: none"> Deliver programs to facilitate achievement of agreed business outcomes. 	<ul style="list-style-type: none"> Benefits Realisation Process
Reduce ICT costs	<ul style="list-style-type: none"> Compliance of ICT program to SCI and AER forecasts. Accurate forecasting of costs. Accurate forecasting of benefits. Best value TCO solutions. Cost effective solution options and re-use. Market testing goods and services. 	<ul style="list-style-type: none"> Quarterly Reconciliation of Budget versus Actual for Capital. Total cost of ownership cost model. Project Cost Model. Baseline Current Cost Model Benefits Realisation Model. Benefits Realisation Process. Quarterly Recompilation of Budget versus Actual for Capital investment. External Benchmarking for operating investment.

The objective of the ICT Investment Plan is to create opportunities for Endeavour Energy to deliver value to customers, stakeholders and the community. The selection of the projects has been driven by Endeavour Energy's business objectives and their alignment to ICT Key Investment Areas. The ICT Investment Plan is further separated into the:

- ICT Capital Expenditure Plan and
- ICT Operating Expenditure Plan

The individual key investment areas of Safety Management; Deliver the Network Plan; Network Billing and Customer Management; Finance and Risk Management; Performance through People and IT Service Delivery are detailed separately in Part 2 of this document and each plan

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demonstrates compliance to the expenditure objectives outlined in sections 6.5.6 (a) and 6.5.7(a) of NER for DNSP by outlining the following:

- Economic rational justifying the proposed expenditure;
- Governance processes, practice and models used to manage, monitor and measure planned versus actual expenditure and business outcomes;
- Methodology used for forecasting ICT initiatives contained in the submission;
- Capital expenditure programs and their alignment to business outcomes; and
- Operating expenditure program and their alignment to business outcomes.

The following sections set out Endeavour Energy's forecast capital and operating expenditure for 2015-2019 regulatory control period.

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ICT CAPITAL EXPENDITURE PLAN

Governance Processes

Endeavour employs the following governance processes and practices to achieve the required outcomes from forecasted expenditure and demonstrate prudent management of funds:

- Management of ICT Capital Demand;
- Prioritisation;
- Economic justification for funding approval;
- Prudent ICT Capital Expenditure; and
- Performance Management

Management of ICT Capital Demand

The Group Strategic Map and the Group Technology Strategic Plan outlines the investment context in which Endeavour as a DNSP within the Network NSW structure is required to operate and provides clear direction as to the strategic outcomes and challenges requiring the “*Utilisation of technology to deliver business outcomes in the most effective and efficient way*”.

ICT Capital funds and resources are constrained within the context of the NNSW business model and the expectations of stakeholders and customers. Endeavour Energy has attempted to achieve the utilisation of technology by developing an optimised capital program which takes into account the demand for ICT capital investment for initiatives, ensuring the investment plan is clearly defined, business driven and suitably justified.

To drive higher returns on IT investment and realise benefits in shorter timeframes, **Executive and Business sponsorship** has been adopted to achieve an optimised capital program. Past experience at Endeavour, which is supported by industry best practice, has shown that executive and business sponsorship is critical to the realisation of benefits and achieving the return on investment in the timeframe required. The ICT investment planning process has been designed to allow executives to own a key investment area aligned to their business area.

The table describes the relationship of executive sponsorship to the key investment areas.

Key Investment Area	Executive Sponsor/s
Safety	<ul style="list-style-type: none"> • General Manager, Health Safety & Environment
Deliver the Network Plan	<ul style="list-style-type: none"> • General Manager, Network Operations • Chief Engineer • General Manager, Network Development
Network Billing and Customer Management	<ul style="list-style-type: none"> • General Manager, People and Services • General Manager, Network Operations
Finance and Risk Management	<ul style="list-style-type: none"> • General Manager, Finance and Compliance
Performance Through People	<ul style="list-style-type: none"> • General Manager, People and Services.
IT Service Delivery	<ul style="list-style-type: none"> • General Manager, Information Communications and Technology

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Together with their business managers, the executive and business sponsor take ownership of the programs which are critical to their business and the achievement of their strategic objectives. This encourages ICT resources to work with business owners to define required business outcomes, to agree and oversee the change management effort, to drive the realisation of benefits and to conduct post capital spend review on benefits realisation.

Within each key investment area, a number of **programs of work** have been developed for each division providing flexibility to the business to determine the scope, level of benefits and timeframes to leverage technology to achieving required outcomes. The focus is on high value and business critical projects. This approach allows the business to explore options for best returns on investment, to respond quickly to initiatives that may offer substantial value to Endeavour. Some of these programs will be managed by IT and as required, supported by a Steering Committee which will include key business process owners.

Appendix D provides the initial list of programs put forward for the 2015-2019 AER submission. This list includes:

- Projects / programs that had been deferred from the current determination period due to industry restructure;
- Projects / programs identified as business strategy enablers; and
- Technical currency program.

These initiatives were reviewed at a high level with business representatives and Executive Sponsors to determine which initiatives should be submitted for inclusion in the ICT Investment plan.

Prioritisation

A zero based prioritisation methodology was utilised in the development of the ICT Capital program of work. To ensure each project included in the AER submission will provide an appropriate level of business value, a process of prioritisation has been followed. Potential initiatives for inclusion were identified by:

1. Referencing candidate project listing, eliminating those that were no longer required and reviewing those that had been deferred from the 12/13 financial year.
2. Review of asset lifecycle to identify when technical currency projects would fall due during the next determination period.
3. Review of strategic initiatives with the business.

The prioritisation of individual projects was then subject to demand management reviews with the business in the first instance and the use of a framework that categorises projects based on their business value measured against three key areas:

- **Risk** - the mitigation of significant risks to meeting business as usual and standard control services requirements and the mitigation of significant risk to meeting mandatory and regulatory requirements;

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- **ROI** - deliver return on investment for projects that provide process improvement and / or cost savings for the organisation; and
- **Enablement** - enabling the organisation to meet corporate objectives.

Projects that are considered mandatory in nature due to legislative or regulatory requirements have been included into the investment plan without the need for further prioritisation. For projects that are not considered mandatory, a combination of financial and non-financial criteria reflective of the Business Strategic Objectives has been used to provide a score for projects put forward for consideration based on a combination of:

- Return on Investment;
- Risk Mitigation;
- Strategic Fit; and
- Business Change Impact.

Evaluation Criteria	Description	Score	Weighting %
Return on Investment	<ul style="list-style-type: none"> • Length of time before the benefits from the investment exceed the estimated investment cost - Payback Period. 	1-3 years = 2 3-5 years = 1 >5 years = 0	30%
Risk Mitigation	<ul style="list-style-type: none"> • Risk Rating following assessment of likelihood and potential consequences of a risk to the delivery of standard control services in the areas of Safety; Environmental; Financial; Reputation; Regulatory and Network categories. 	Extreme = 3 High = 2 Medium = 1 Low = 0	25%
Strategic Fit	<ul style="list-style-type: none"> • How well does this investment support the organisations strategic objectives? • (High >2 objectives; Medium 1-2 objectives; Low 0 objectives) 	High = 2 Medium = 1 Low = 0	25%
Business Change Impact - Architectural Fit	<ul style="list-style-type: none"> • How well does this investment fit with the business and technical architecture & roadmap? • (High >2 Architectural principles; Medium 1-2 Architectural principles; Low 0 Architectural principles). 	High = 2 Medium = 1 Low = 0	10%
Business Change Impact – Project Risk	<ul style="list-style-type: none"> • What is the risk of implementation being more expensive, taking longer than planned, non-completion or the project or not achieving the planned benefits from the investment? 	High = 0 Medium = 1 Low = 2	10%

Application of the criteria in the above prioritisation matrix serves to provide the following:

- balanced program of work;
- assurance that projects prioritised within the program are in alignment with the organisations goals and objectives; and
- optimised ICT investment.

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A risk assessment has been conducted against each initiative in Endeavour Energy's ICT investment plan. Non mandatory initiatives, where the risk rating has been evaluated as low and where there is expected to be little return on investment, have not been included in the ICT Investment Plan. Where initiatives have been included in the ICT Investment Plan, a more detailed assessment of risk has been included in the Capital Investment Programs section of the related Key Investment Area.

The following table summarises the prioritised capital expenditure:

\$ Millions	2015	2016	2017	2018	2019	Total
Mandatory	0.44		0.50	0.18	0.51	1.63
Risk	11.34	11.33	11.76	15.63	13.02	63.08
Strategic	0.52	0.79	0.79	2.12	2.04	6.26
Improve (ROI)	4.08	3.97	4.72	3.23	2.05	18.05
Total	16.38	16.09	17.77	21.16	17.62	89.02

Appendix E demonstrates the prioritisation model applied to proposed projects for the 2014/15 financial year, which resulted in the final list of projects to be put forward for approval for that financial year.

Economic Justification for Funding Approval

Programs within the forecasted expenditure do not automatically get funded. There is a three step process that must be successfully completed to receive total funding allocation for programs and initiatives within a program. At each step the business owner must be able to demonstrate the value of the technology investment and articulate how proposed benefits will be or have been quantified, the processes for benefits realisation, as well as confirming project costs.

At any step in the process a program of work or an initiative within the program can be cancelled or deferred pending more substantiative information to support the decision to fund. The steps are outlined below:

Step	Description	Outcomes Required for Next Step
1	Case for Change	<ul style="list-style-type: none"> Business problem/opportunity defined Business outcomes/objectives agreed Success criteria defined High level prioritisation Baseline of current costs identified or methods agreed Benefits identified and estimated Benefits realisation process proposed Key Issues and risks requiring further investigation Business process redesign opportunities identified and recommended Architectural principles and standards to be applied Recommendations for re-use, buy, build, lease or share opportunities Key business resources needed to deliver the project Document endorsed by General Manager of the Division and recommendation for ICT to either proceed to Phase 1 Business Case or to be deferred/ cancelled.
2	Phase 1 Business	<ul style="list-style-type: none"> Business Justification with capital and operating expenditure endorsements/approvals Project scope

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Case	<ul style="list-style-type: none"> • High Level solution design • Estimated phase 2 costs • Solution selection • Vendor selection • Identify operating vs. capital substitution opportunities • Evaluate Total Cost of Ownership • Estimate of phase 2 NPV.
3 Phase 2 Business Case	<ul style="list-style-type: none"> • Business Justification with capital and operating expenditure endorsements/approvals • Project scope • Full project costing estimates • Solution implementation • Establish business benefits identification and tracking process • Calculation of project NPV.

Examples of the three step processes are provided in the appendices as follows:

- Case for Change – Appendix F;
- Phase 1 Business Case – Appendix G and
- Phase 2 Business Case – Appendix H.

Endeavour has a financial governance process, depending on the full value of Phase 1 and Phase 2 business cases, including capital and operating costs.

\$ Investment	Process Step
Under \$200,000	<ul style="list-style-type: none"> • Endorsed by ICT Project Management Committee • Approved by General Manager IC&T
\$200,000 > \$500,000	<ul style="list-style-type: none"> • Endorsed by ICT Project Management Committee and General Manager IC& T • Approved by Chief Operating Officer
\$500,000 > \$5m	<ul style="list-style-type: none"> • Endorsed by ICT Project Management Committee, General Manager IC& T and Investment Governance Committee • Approved by Chief Operating Officer
\$5m > \$10m	<ul style="list-style-type: none"> • Endorsed by ICT Project Management Committee, General Manager IC& T, Investment Governance Committee and Chief Operating Officer • Approved by Chief Executive Officer
Over \$10m	<ul style="list-style-type: none"> • Endorsed by ICT Project Management Committee, General Manager IC& T, Investment Governance Committee; Chief Operating Officer and Chief Executive Officer • Approved by the Board

Endeavour will aim to prudently manage the capital investment needed to deliver outcomes for the business by employing the following four guidelines:

- **Leveraging Existing Technology** – Identify opportunities for re-use of systems and consolidation of processes by using business architecture models that leverages existing technology rather than investing in new technologies;
- **Linking Technology and Process** - Investment in technology must be linked closely with key end to end processes to facilitate business enablement to achieving corporate strategic goals and objectives of Safety, Reliability, Sustainability and Customer Value.

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Investment in technology combined with good business process design principles can more cost effectively provide the means to process more transactions, improve data quality, store more data and provide more information to the Network business and workforce management. New technology and functionality of systems (e.g. mobile applications) provides an important means to deliver productivity improvements. Introduction of systems with new functionality or enhanced platform interoperability allows further automation of processes and can lead to reduction in the labour component in business processes. This results in more efficient processes and the freeing up of scarce labour resources;

- **Operating vs. Capital substitution** – each investment opportunity is evaluated in terms of the trade-offs of operating to capital investment. This is undertaken through assessment of ongoing operating costs required to continue with the “status-quo” or the potential for purchase of services in preference to capital investment; and
- **Total Cost of Ownership Solution Selection** - The selection of a solution is critical to the cost of the project and ongoing support costs for Endeavour and leveraging technology to achieve business outcomes. To guide technical selection, a set of guiding principles for initiatives and investments has been defined to guide decision makers in ensuring that investments are aligned and will contribute to the achievement of corporate outcomes. These principles have been derived from industry trends and technology innovation relevant to utilities over the next five years. A total cost of ownership framework has been developed to allow the solution selection to consider both capital and operating costs and to identify where it is beneficial to favour a capital funded option over operating funded option or vice versa.

Prudent ICT Capital Expenditure

Endeavour demonstrates its prudent approach to capital investment forecasting by complying with the internal capital funding approval process which is a two pass approach. In the first pass, known as Phase 1 Business Case, projects must deliver detailed scope, costing and benefits analysis as mandatory inputs to allow assessment of business value to gain capital funding approval to commence the second pass, Phase 2 Business Case.

Within the individual Key Investment areas, the options for investment are considered in detail. Only those projects where “do nothing” was not an option have been included in the investment program. The result of this approach is 58% will be invested in technical currency projects across all key investment areas to deliver an assured business platform for operating the business and delivering supply. Only “improve” projects where positive benefits, improved risk mitigation, cost avoidance or cash savings can be realised have been included in the program.

Performance Management

The measurement and evaluation of project success and delivery is key to ensuring that expenditure has been effectively invested and benefits and savings can be realised and repeated.

Measurement

The effectiveness of ICT expenditure is measured by benefits realisation at a project level. All projects are required to include expected benefits and associated measurements at time of

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business case. On completion of the project the business is required to report on the actual benefits realised, as defined in the Business Case. The business benefits realisation review may be completed up to 12 months after the implementation of the ICT solution on the basis that some benefits will require significant change management to achieve, or an agreed period to measure the impact of the change.

Benchmarking

Benchmarking is used to assess the performance of IT service delivery and expenditure in both capital and operational costs to drive efficiencies and to measure the effectiveness of investment in software, hardware and tools to support service delivery.

Endeavour Energy's ICT performance has been measured by KPMG through a number of performance indicators (metrics) benchmarked against other utility businesses in NSW, Queensland and Victoria. Assessment of these metrics has been undertaken to ensure that the planned capital expenditure outlined in the AER submission is consistent with industry standards and to identify areas of improvement or opportunities to leverage capital investment to achieve business outcomes.

Outlined below is Endeavour Energy's performance to other utilities and how benchmarking has been used to deliver value. Three key areas that have influenced ICT investment are:

- **Endeavour Energy has higher IT Operational Expenditure** - Endeavour Energy's IT operational expenditure is higher than the benchmark mean when measured as a % of corporate operating expenditure (excluding depreciation) (8.26% Endeavour Energy vs. 5.25% mean). This AER submission includes investment in capital projects that addresses previous capital deferment that will result in an assured business platform by eliminating legacy applications, legacy operational systems and legacy operating platforms and thereby reducing operating expenditure;
- **Highest share of Outsourced Services** - Endeavour Energy has an ICT sourcing strategy that is focussed on achieving best value for the Endeavour business. This sourcing strategy includes having contracts with Optus and CGI (formerly Logica) for the delivery of its IT Service delivery. 74% of Endeavour Energy's IT operating expenditure is spent on outsourced services. This is the highest compared to other utilities in the benchmarking group. As a result of the outsourced IT strategy, Endeavour has the second lowest number of supported IT users and the second lowest number of internal IT employees; and
- **Lower Capital Expenditure than the benchmark** - Endeavour Energy has the second lowest capital expenditure of the benchmarking group. The low capital expenditure is reflected in the reducing value of IT assets and the low IT asset value in comparison to the benchmark (0.74% Endeavour Energy vs. 1.59% mean) as measured by the "IT asset value as a % of regulated corporate asset value" which is consistent with Endeavour Energy's use of ageing systems and deferment of capital expenditure in recent years. The impact of this delay can also be seen in the increase in Average User Minutes Lost (AUML) over the 2012/13 financial year – appendix C.

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Risk Management

The management of risk is core to the delivery of the strategic objectives and plans of the organisation. A comprehensive risk assessment is performed annually in the context of the uncertainties and barriers to the successful delivery of the plan including the identification and assessment of potential emerging risks linked to the breakdown of the underlying assumptions and business value drivers that underpin the strategy.

Uncertainties material to the delivery of the ICT investment plan are shown in the following table:

Risk	Gross Risk	Mitigation
Committed capital projects cannot be delivered by agreed funding and available resources due to Industry Restructuring constraints.	Up to 12 months delay in realised business benefits.	<ul style="list-style-type: none"> Alignment of projects against strategic objectives Quarterly review of programs Phase 1 projects to identify risk, resourcing and detailed planning Apply appropriate delivery models Architecture and security review and standardised technology set.
The organisation is unable to absorb the amount of change required by ICT Projects.	Capital work needs to be written off Up to 12 months delay in realised business benefits.	<ul style="list-style-type: none"> Strong alignment of projects against strategic objectives Training Plan Apply appropriate delivery models Apply Change Management for significant projects Early and effective engagement of sponsors.
Failure of ICT infrastructure or applications that significantly impacts the delivery of critical business processes and information.	Significant loss of productivity due to staff not being able to operate systems during downtime.	<ul style="list-style-type: none"> Continued testing of DR and business continuity Establish new infrastructure contracts that enable automated failover of services to redundant systems Maintain the technical currency of key systems with focus on backup systems.
Significant security breach resulting in unauthorised data or systems access.	Loss of confidential information or financial fraud.	<ul style="list-style-type: none"> Complete existing Audit logging and filtering projects to identify unauthorised Strengthen intrusion prevention systems to block malicious attacks Improve staff security awareness.
Change in service provider during the term of the strategic plan.	Loss of productivity due to loss of knowledge and transition activities Reduced availability of systems due to increased resolution times.	<ul style="list-style-type: none"> Knowledge management and knowledge transfer through extensive use of document management system capabilities Design solutions with flexibility of in sourcing and service delivery as a requirement Engage experts in planning, negotiating and executing multi-sourcing contracts.

Treatment Action Plans to control the material risk have been identified, resourced and budgeted in the strategic planning process.

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Forecasting Methodology

The ICT investment roadmap has been developed using a bottom up (or 'zero based') approach, to ensure the program of work is a true reflection of the needs of the organisation balanced within capital constraints applied for the determination period.

Framework

At each stage within the planning cycle, initiatives put forward for consideration are evaluated based on their contribution to Business Strategic Objectives and ability to meet Statement of Corporate Intent (SCI) budgetary constraints.

This process is repeated, becoming more granular as initiatives progress through the planning cycle from the five year rolling plan, the annual budgeting cycle and finally when a business case is put forward as part of the governance process for investment prioritisation and approval.



Project Cost Estimation Methodology

The program estimates developed for the five year regulatory period have been obtained using a standard cost model to ensure consistency in project estimation and costing.

The model determines costs by the examining the following factors:

- Type of project;
- Complexity of project;
- Duration of project (no of weeks)
- Standard Project Management cost - Cost per day for a PM (current CGI rate card daily rate for a level 3 project manager); and
- Multiplier for project phase - Allocation of no of PM days per week multiplied by complexity of project, phase multiplier then applied.

A number of estimation assumptions have been made in developing the project cost model for each of the above factors as well as integration costs, business change management and transition. More details on the forecasting methodology is available in Appendix B and discussed separately in each of the Key Investment Areas.

Capital Forecast for 2015-2019 Determination Period

The projects and investments for the Endeavour Energy ICT Investment Plan for the 2015-2019 AER Submission have been developed from consideration of the strategic plans for each of Endeavour Energy's business areas. Each plan identifies the strategic objectives and the business drivers from which potential ICT projects have been identified and prioritised.

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The rationale for this approach is to maximise technology investment and directly contribute to the attainment of strategic and operational goals. This has been achieved through consultation with the Executive Leadership Team, Divisional General Managers and Branch Managers who own key business processes and key stakeholders. This alignment of investment to outcomes allow business leaders to work with ICT to determine level of investment required to maintain supply of standard control services and to identify how technology can enable the business to achieve efficiency gains.

Endeavour Energy has the ability to adjust resources to meet the business needs within the outsourcing model. This can be done with minimal impact to Endeavour resourcing and staffing.

Each key investment area contains major programs of work. A brief outline of each investment area is provided below.

Safety Management

During the last determination period, Endeavour Energy leveraged technology and redesigned processes to bring about cost efficiencies in the provision of Safety Management Services and to meet compliance obligations. In the coming determination period there will be an assured business operations program as well as a program to build on existing technology to achieve the following safety strategic objectives:

- To drive continuous improvement and employee capability and embed MySafe as a trusted source of safety data;
- Improved safety standards through mobile technology and mobile data and
- Extend safety management systems to include contractors and ASP's.

Deliver the Network Plan

Deliver Our Network Plan is one of Endeavour Energy's core business areas and has forecast the largest expenditure. Investment is targeted to maintain and improve the management of assets, to facilitate process automation improvements and mobile crew efficiencies and to provide an on-going assured business platform.

Investment is forecast in projects and tools to provide improved management of assets including monitoring and modelling of the Low Voltage Network to support the prediction of issues with power quality and a reduction in costs through risk and condition based maintenance tools. The alignment and integration of OT and IT asset information data to optimise business processes will enhance the decision making process and reduce costs and risks.

Improved process automation and mobile crew efficiency will be targeted through field force automation solutions and improved workforce scheduling tools. Investment in this area is critical to achieving reduced costs of field inspections and rectification processes through improved data quality and timeliness of data updates to support the management of the network.

An assured business operation program will mitigate business risks through an upgrade to core business applications and tools such as the Outage Management System (OMS), the Project Portfolio Management System (PPMS), GIS and other systems, replacement of the DINIS system and investment in technology to provide improved reporting and decision support tools to

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assist the management of network sustainability and cost effectiveness to meet customer reliability standards.

Network Billing and Customer Engagement

Network billing is the main revenue stream for Endeavour. Business activities in this process must comply with the regulations and licencing requirements of the Australian Energy Market Operator (AEMO). Non-compliance or lack of data accuracy may result in financial penalties and revenue loss for Endeavour Energy.

Investment is planned to achieve more cost effective business operations through mobile operations, work scheduling and improved customer communications, ensuring business as usual operations through investment in business continuity improvement projects, replacement of legacy systems and meeting regulatory requirements.

Endeavour Energy will use this opportunity to engage in shared services initiatives with Ausgrid and/or Essential Energy where appropriate.

Finance and Risk Management

The business risk management strategic plan plays a vital role in supporting the leading organisational values of safety excellence, respect for people, commitment to customers and communities, continuous improvements and integrity. Investment in technology is critical to the objective of continuous improvement in business risk management across the organisation. Investment is targeted principally in three areas: providing an on-going assured business operations, ensuring regulatory compliance and providing improved decision support information.

Performance through People

Relatively low investment is forecasted in this area with a focus on maintaining and enhancing existing systems and small improvement projects. Enhancements will continue in the next AER period to leverage investment in key systems to drive continuous improvement and employee capability, in particular user friendly web front ends which will integrate key back end systems such as Ellipse, the intranet, internet and the document management system. Areas of focus will include projects that support a more “mobile” workforce, reduce the burden of back-office processes through increased self-service capabilities and improved data quality to support decision making.

IT Service Delivery

IT Infrastructure is essential to deliver all of Endeavour Energy’s ICT strategic objectives. Significant investment is required in this area to address three critical issues:

- Increasing operational risk – availability;
- Inflexible IT infrastructure - proprietary architecture, vendor lock-in; and
- Increasing operational costs – Licensing, maintenance and support.

Forecast investments include several programs to address systems that are considered “end of life” as they reach the end of support and extended support.

Improvement projects include upgrades to Endeavour’s systems to provide assured Business Continuity, implementation of IP Telephony and full implementation of the wireless LAN.

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A review of the Endeavour Energy's service delivery operations has identified that improved management tools would assist pro-active delivery of services enabling support to its IT users, performance and capacity objectives, and ultimately our customers. Investment has been identified in the areas of asset management, licence management and business continuity improvements.

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Alignment to NER Capital Expenditure Objectives

Investment in Endeavour Energy systems over the next five years is required to deliver supply and to support compliance of business processes to meet regulatory and market requirements. Alignment to the NER capital expenditure objectives is summarised below. A detailed alignment is outlined in each individual Key Investment Area plan of Safety Management; Deliver the Network Plan, Network Billing and Customer Management, Finance and Risk Management, Performance through People and IT Service Delivery.

The table below provides a summary of alignment to the NER Capital expenditure objectives:

Mapping to the relevant “Capital expenditure objective(s)” (Chapter 6, National Electricity Rules) The forecasted operating expenditure is considered necessary to achieve:		
Guidelines	Key Investment Area	Explanation
6.5.7(a)(2) comply with all applicable <i>regulatory obligations or requirements</i> associated with the provision of <i>standard control services</i>	<ul style="list-style-type: none"> Network Billing and Customer Management and Compliance. IT Service Delivery. 	<ul style="list-style-type: none"> Investment in the security and compliance of IT applications support the business to meet operational and billing timeframes, provision of information and electricity supply requirements and regulatory obligations.
<p>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</p> <p>(i) the quality, reliability or security of supply of standard control services; or</p> <p>(ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent; or</p> <p>(iii) maintain the quality, reliability and security of supply of standard control services and</p> <p>(iv) maintain the reliability and security of the distribution [transmission] system through the supply of standard control services.</p>	<ul style="list-style-type: none"> Deliver the Network Plan. Finance and Risk Management. Performance through People. IT Service Delivery. 	<ul style="list-style-type: none"> Investment in process automation, mobile crews, network asset information and IT infrastructure and applications will support the objectives of managing network sustainability, cost efficiency and productivity improvements to meet quality and reliability of electricity supply.
6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services.	<ul style="list-style-type: none"> Deliver the Network Plan. Safety Management. 	<ul style="list-style-type: none"> Safety processes, security systems and associated technologies to collect and analyse asset information support the safety of Endeavour Energy’s distribution network.

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ICT OPERATING EXPENDITURE PLAN

Governance Processes

Endeavour Energy employs the following governance processes and practices to achieve the required outcomes from operating expenditure and to demonstrate prudent management of funds:

- Baseline Cost Management;
- ITIL Framework for service management and delivery; and
- Performance Management.

Application of these processes have proven to be successful and demonstrates management practices that provide the best value for Endeavour Energy in the provision of stable, reliable and secure platforms that support the delivery of standard services.

Baseline Cost Management

Over 75% of ICT operation costs are associated with the provision of outsourced services by service providers and third party vendors. Endeavour Energy manages the operational investment needed to deliver outcomes for the business by employing schedules of common services and schedules of governance when tendering for ICT support services. A standard schedule of common services and schedule of enhancement common services is provided with each tender released to the market.

The objectives Endeavour Energy expects to achieve through outsourcing ICT services are:

- Reductions in operational costs related to ICT support services;
- Ensure that common ITIL Framework Processes, and activities, are included in all Service Schedules provided to market via RFT process;
- Ensure that Service Providers work collaboratively and cooperatively with Endeavour Energy and Other Service Providers to deliver end to end IT Services that meet the expected business process KPI targets set by business management;
- Ensure that Endeavour receives ICT services that consider an end to end enterprise view across all IT service towers; and
- Ensure that Endeavour achieves efficiencies and enhanced service delivery through enterprise wide best practice processes and highly capable subject matter experts in each technology and process area.

ITIL Framework for service management and delivery

The ITIL framework is used by many organisations to establish integration for the support and maintenance of multiple technology elements to enable an end-to-end service offering for the business IT services. It allows the organization to establish a baseline from which it can plan, implement and measure. It is also used to demonstrate compliance and to measure improvement.

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Endeavour Energy manages all aspects of its ICT environment based on the principles outlined within the ITIL V3 framework. The framework defines overarching categories, processes to deliver the categories, and activities defined within each process.

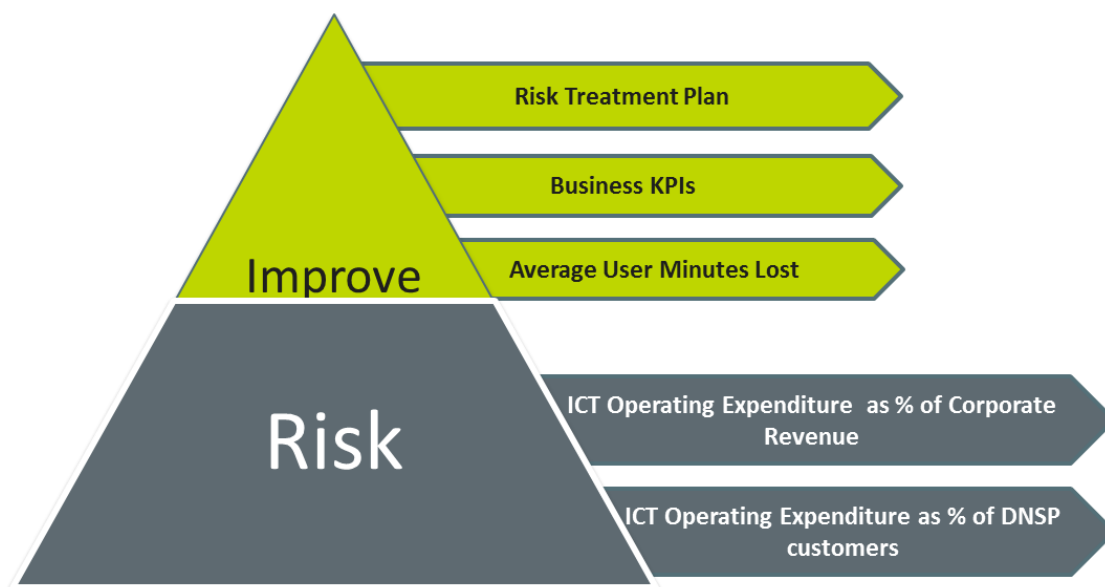
Each Service Provider engaging with Endeavour Energy is responsible for various activities across most categories and processes within the ITIL Framework. A schedule of common services is included in each tender as ICT work is sent to the market. This document seeks to outline the high level roles and responsibilities across the activities within the ITIL framework to ensure there is a general understanding between Service Providers and Endeavour Energy staff in relation to everyone's core accountabilities within the ICT delivery model.

Performance Management

Measurement

To reflect the impact on ICT operating expenditure, KPI's have been classified as either "Risk" to reflect the impact of work that is defined as keeping IT systems in a state of "business as usual" or as "Improve" to reflect the operational component of investing in improved technology or enhancing business capability and processes.

Ongoing monitoring of key "Risk" and "Improve" operational KPI's will ensure that investment in ICT is both prudent and efficient, and is also directed towards initiatives that are of most benefit to the organisation and its stakeholders. The following diagram describes KPI's to be measured ongoing to assist in gauging operational performance to strategic goals, beyond the standard benchmarked measures.



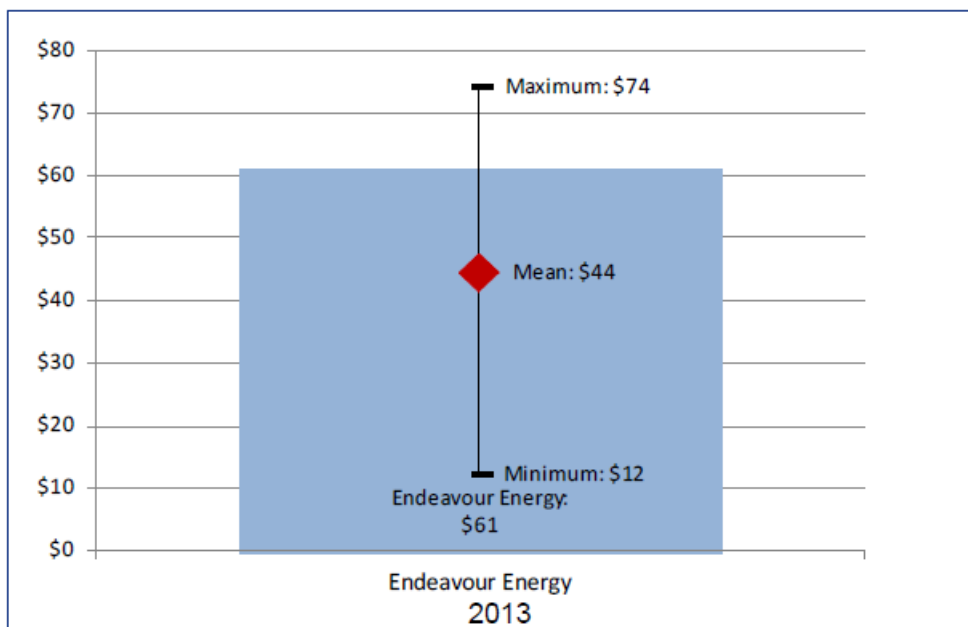
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Benchmarking

In response to NER guideline 6.5.6(e) (4), annual benchmarking activities were undertaken at the end of 2013. These benchmarks looked at the organisations performance, investments and operating activities for the financial year 2012/13. Endeavour Energy was benchmarked alongside nine other organisations in the electricity and natural gas distribution sectors across Australia. The following benchmarks results relate to the measurement of operational expenditure efficiency.

Endeavour Energy Non-Network ICT Operating Expenditure as a percentage of DNSP customers - Endeavour Energy's IT operational expenditure expressed as a cost to serve metric is shown below (blue bar shows Endeavour Energy's performance compared with the range of other participants and the mean. Endeavour Energy is 38% above the mean):



The potential causes of higher than mean operating expenditure include:

- Potential allocation differences across the country. Endeavour Energy outsources its telecommunications management services to Optus and this scope includes the costs for maintaining microwave and radio systems used for Network Systems. These costs are not transferred to Network Systems funds but are 10% of the IC&T budget and therefore a material impact to the benchmark. Some ICT costs carried by Endeavour Energy ICT may be allocated to business within other DNSPs. In some cases, configuration and data management are carried out by business staff and therefore are presented as costs shown for business as usual costs by other operating divisions.
- Within Endeavour Energy, the outsourced delivery model means that costs are centralised and therefore may capture costs that are allocated to business within

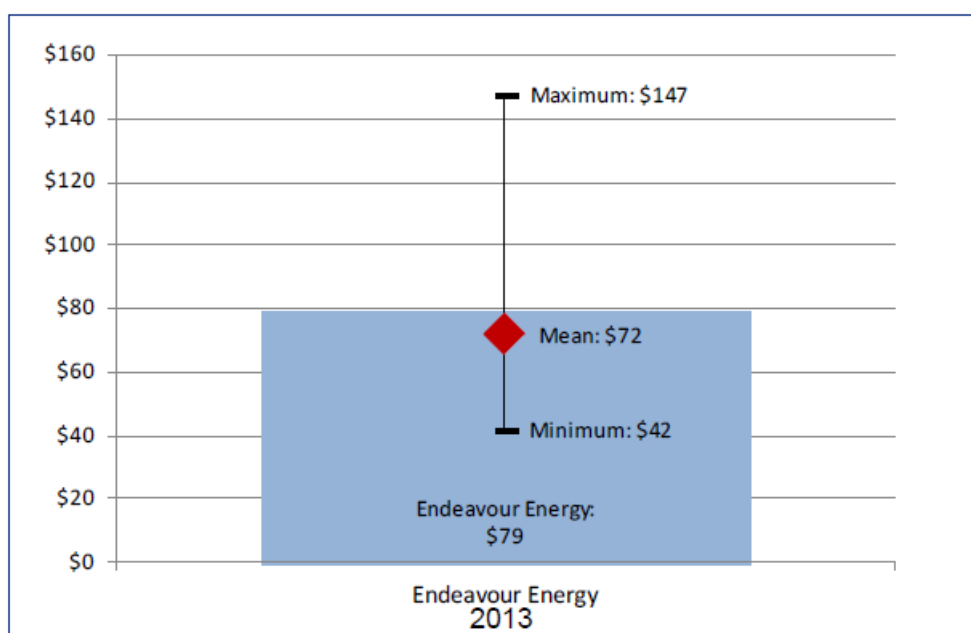
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other organisations. Going forwards cross Networks NSW a “cost to serve” initiative is being undertaken where Ausgrid, Essential and Endeavour Energy will compare costs for ICT business services to identify more granular benchmarking of costs for common services normalised to customer numbers. This initiative may highlight allocation differences that could further explain Endeavour Energy’s benchmark position.

- The implementations of some systems using “as-a-service” cloud based solutions, including the Ausgrid Metering Business System (MBS), Endeavour’s compliance management system, desktop leasing and recruitment systems lead to higher operating costs and incur lower capital expenditure costs compared to the average. The overall spend of non-system ICT (capital and operating) is closer to the mean.
- The existing outsource contracts have not been market tested for seven years. This is now a works in progress and is expected to be completed by the end of 2014 with transition activities occurring until mid-2015. Initial indications are that substantial cost savings may be achieved through the market tests that may lower the Endeavour Energy benchmark performance.
- Investment in the replacement of our network billing, meter data management system, corporate and call centre voice systems and data centre infrastructure, which are work in progress projects, requires higher maintenance and support costs than modern replacements will incur. See the next diagram showing that our total investment (operating expenditure and capital expenditure) is only slightly above mean.

The following diagram shows the benchmark performance for Endeavour Energy Non-Network ICT operating expenditure and capital expenditure investment per DNSP customer:



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As a result of higher than average operating expenditure, the development of the ICT investment plan is focused on capital expenditure that will result in a reduction in operational expenditure, including:

- Investment in projects that will result in an assured business platform by eliminating legacy applications, legacy operational systems and legacy operating platforms which are inherently more expensive to operate and maintain;
- Implementation of automated monitoring, provisioning and failover capabilities into new infrastructure services that will lower the operating costs for ICT going forwards.

While these benchmarking results indicate increasingly high costs of ICT operational expenditure, it is expected that these results will improve in subsequent benchmarking results from 2014 onwards, with results to continue to improve over the determination period when Project Challenge and ICT market testing cost reductions are realised.

Full benchmarking details are contained in Appendix C of the 2015-2019 AER Submission.

Strategic Sourcing Strategy

In the early stages of 2012, the process commenced to articulate the full requirements for competing for 100% of ICT Services which were outsourced under existing baseline contracts with CGI (formerly Logica) and Optus. This process was interrupted temporarily with the news of Industry Reform whereby the sourcing strategy for IT services was reviewed in terms of its scope, with a view to achieving synergies across all 3 NSW energy distributors.

Upon joint review within the NRP, a decision was made to split Endeavour Energy's sourcing initiatives separating some components for continued joint discussions, and some components whereby Endeavour would continue to source directly for its own purposes only. To this end, it was agreed that:

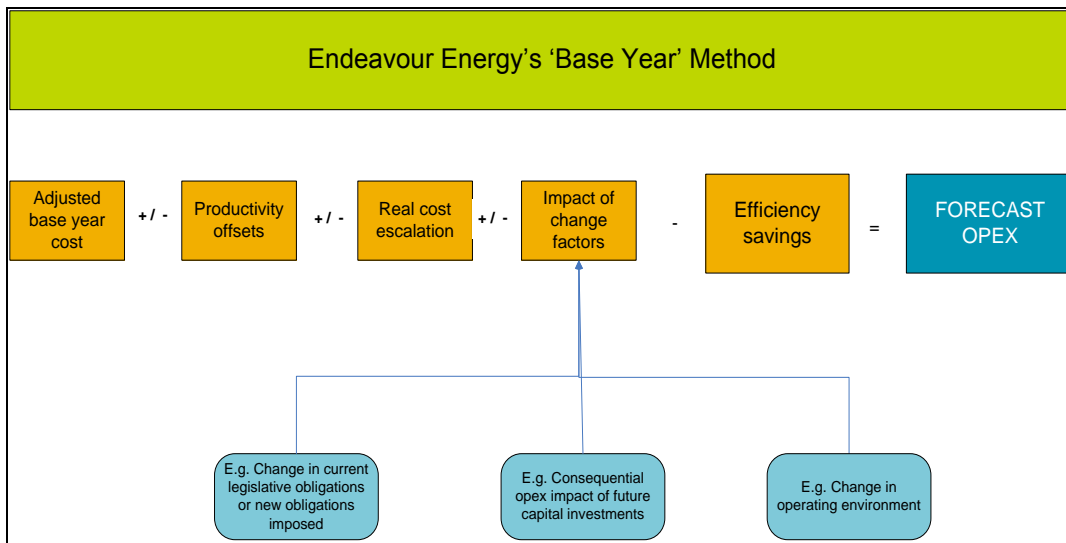
- Core applications would continue forward with a planned market test by Endeavour Energy only as these applications were generally unique to Endeavour.
- Telecommunications carriage and infrastructure outsource services would be jointly procured to obtain improved discounts from the market.
- CGI's contract would be extended for a further two years with provisions allowing for the de-scoping of application related services in line with Endeavours revised sourcing strategy; and
- The Optus contract would be extended for one year with a further option of an additional year if required. This contract allows for the de-scoping of services being market tested as necessary.

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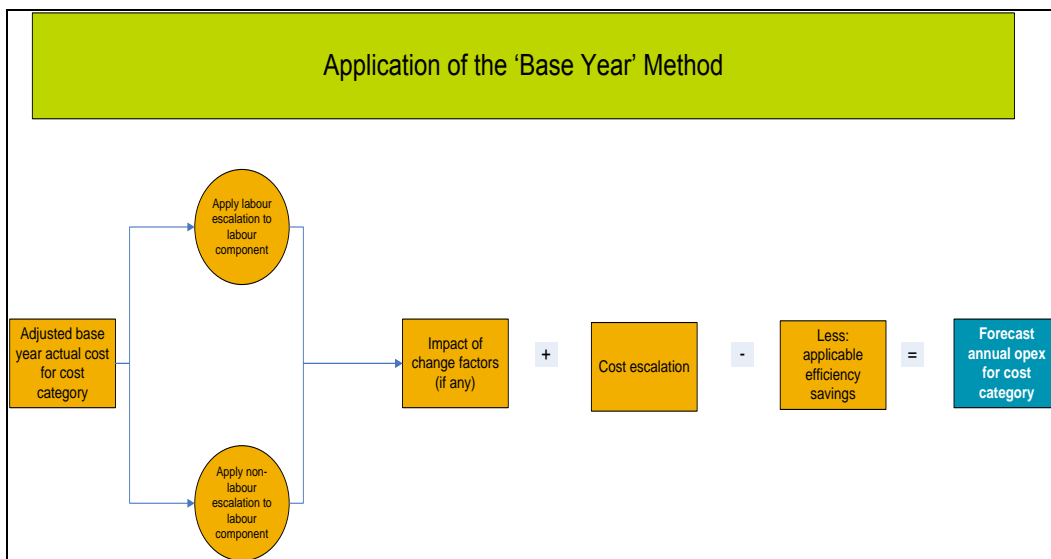
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Forecasting Methodology

To comply with the NER and to ensure that costs are appropriately accounted for in the preparation of our forecast, the base year method has been applied, with the forecast for ICT operating expenditure reflecting costs for an agreed base year adjusted for expected changes. These changes may include operating environment, regulatory obligations, and changes in demand and cost inputs. This method ensures that all known factors affecting future operating expenditure requirements are appropriately accounted for:



The following diagram depicts the application of the base year method by Endeavour Energy.



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Actual operating expenditure for the financial year 2012/13 has been used as our base year for forecasting. This financial year is the fourth year of the current regulatory period and has been used because it is the latest actual operating expenditure data available at the time of preparing the forecast. It also had been reviewed by an external auditor as part of the annual regulatory reporting to the AER. Labour costs have been escalated according to the Labour Price Index for the 2015-2019 regulatory period⁷.

- Recurrent expenditure for infrastructure, application and telecommunications support have been escalated using a forecasted CPI increase of 2.5% per annum as per support contracts with vendors for annual cost of living adjustments;
- Increases to operating expenditure as a result of the ICT capital program have been forecast based on review of previous financial year trends and adjusted for CPI increases. These increases reflect additional support and maintenance costs associated with the implementation of new solutions required to support the organisation in the delivery of standard services;
- Operating expenditure required to support the delivery of the capital program has been forecast based on review of previous financial year trends and adjusted for CPI increases. These costs reflect project activities that are unable to be capitalised in accordance with International Accounting Standards, including strategic roadmap development; project scoping; requirements gathering and training;
- Cost savings initiatives have been factored in using a combination of:
 - Actual annualised contract reductions realised during the 2013/14 financial year
 - Estimated annualised cost savings of 10-15% for remaining contracts that will go to market in late 2013/14 or early 2014/15
- An alternate allocation model has been used in this determination with Metering types 5 to 6 and ancillary network services removed from Standard Control thereby reducing the percentage allocation when compared to 2009-2014.

Endeavour Energy is confident that the forecast base year of 2012/13 is an accurate representation of the scope of operating expenditure required to support network operations and maintain AUML standards for ICT systems into the next AER determination period.

Operating Forecast for 2015-2019 Determination Period

A total operating expenditure of \$198.05 million is forecast for the five year period from 2015-2019. This represents an increase of \$29.5 million from the forecast previous AER determination for the period 2009-2014 of \$168.5 million but a decrease of \$1.5 million on the actual spend of \$199.6 million in this AER period. The operating expenditure forecast for the 2015-2019

⁷ Labour Price Index is the most appropriate measure of labour price as advised by The Independent Economics report and calculation methodology is provided in an attachment to main SRP.

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determination period represents a small decrease on actual spend in the current determination period.

The operating expenditure forecasts for the five year period from 2015-2019 convey cost containment compared to an industry trend of increased ICT operating expenditure against total organisation expenditure. The forecasts reflect deliberate actions such as strategic sourcing and investment in current ICT infrastructure environments to achieve efficiencies and absorb unavoidable increases due to CPI.

The forecast annual operating expenditure is summarised in the following table:

\$ Millions	Base Year 2013 Actuals	2015	2016	2017	2018	2019	Total (not inc Base Year)
ICT Labour & Overheads							
IT Infrastructure & Applications Service							
Telecommunications							
Third Party Support Agreements							
Market Testing and Transition costs							
Project Delivery Operating Costs							
Miscellaneous Operations Activities							
Total							

Table 5: Forecast Annual Operating Expenditure (adjusted to reflect regulated / standard controls allocation only)

- Labour forecast assumes a 2.5% CPI increase per annum, and assumes that the current staffing level of 60.1 FTE's (63 FTE's in 2012/13) will be maintained over the determination period.
- Support costs for Applications and Infrastructure and Telecommunications have been forecast based on the following assumptions:
 - Support cost reductions as a result of market testing are based on actual annualised savings realised on contract negotiation for those contracts that have been completed. For contracts that will be market tested in late 2013/14 and 2014/15 assume a 10-15% reduction on all contracts, which is a conservative estimate based on results experienced to date. Savings have been included in the forecast in accordance with the Strategic Sourcing schedule;
 - Support service costs are indexed at 2.5% per annum to allow for cost of living adjustments; and
 - Once off transition costs for outsource contracts are forecast for the 2014/15 financial year. These transition costs equate to approximately 5% of total expected savings of market testing over the 2015-2019 AER period;

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- Growth for third party support agreements has been forecast on the following assumptions:
 - Expected demand as a result of capital investment will remain constant and has been forecast using trend analysis from previous years
 - Existing third party support agreements are indexed at 2.5% per annum
- Project Operating Expenditure will remain constant and has been forecast using trend analysis from previous years (less project operating costs incurred in 2012/13 not representative of standard spend) indexed at 2.5%.

Prudent Cost Management

In accordance with NER guidelines, clause 6.5.6(c), Endeavour Energy has undertaken a number of initiatives to ensure that ongoing forecasted operating expenditure reflects an efficient and prudent approach in order to achieve its operating expenditure objectives in a manner that reflects realistic ICT expenditure levels for a DNSP.

To address increasing operating costs of the organisation, Endeavour Energy instigated the Customer Value Improvement Program comprised of projects Compete and Challenge to co-ordinate companywide cost savings and productivity improvement measures. As part of the Project Challenge program of work, ICT put forward a number of initiatives to address increasing operating expenditure levels, these initiatives focused on cost reduction through rationalisation and decommissioning of legacy systems and on strategic sourcing for support services. These initiatives are now on track to achieve annualised savings of \$12 million. These savings will be offset against net growth and standard cost of living adjustments for support and maintenance of applications and infrastructure. Consequently, the operating expenditure forecast put forward for the 2015-2019 determination period represents a small decrease (1%) on actual spend in the current period.

The following diagram provides a high level bridge of annual operating costs from 2009/10 to 2018/19 and demonstrates where cost saving initiatives have offset operating cost increases over the last determination period and will provide ongoing benefits into the 2015-2019 AER determination period.

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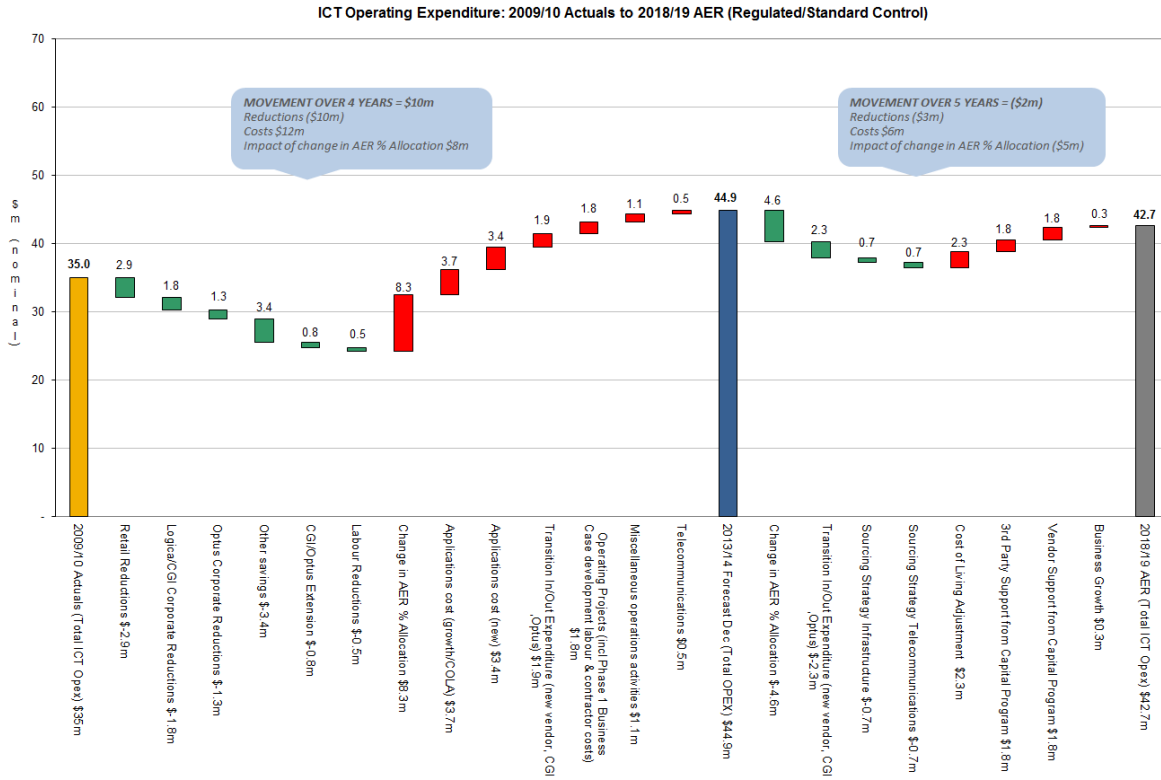


Figure 2: Expenditure Bridge analysis 2009/10 – 2018/19 (nominal dollars)

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Alignment to NER Operating Expenditure Objectives

Alignment to the NER operating expenditure objectives is summarised below:

Mapping to the relevant “Operating expenditure objective(s)” (Chapter 6, National Electricity Rules) The forecasted operating expenditure is considered necessary to achieve:		
Guidelines	Major Investment Area	Explanation
6.5.6(a)(2) comply with all applicable <i>regulatory obligations or requirements</i> associated with the provision of <i>standard control services</i> .	<ul style="list-style-type: none"> Contracts and support agreements with outsourced service providers, supported and managed by Endeavour Energy ICT labour. 	<ul style="list-style-type: none"> Structured support to deliver legislative and regulatory ICT requirements related to security & privacy.
6.5.6(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to: <ul style="list-style-type: none"> (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent; (iii) maintain the quality, reliability and security of supply of standard control services and (iv) maintain the reliability and security of the distribution [transmission] system through the supply of standard control services. 	<ul style="list-style-type: none"> Contracts with outsourced service providers to manage and support infrastructure and telecommunications that form the underlying support structure for key asset management solutions. Third party support agreements for application support for applications that are utilised for inspections, maintenance and augmentation planning and execution. 	<ul style="list-style-type: none"> Contracts are structured to deliver cost effective support for infrastructure and applications. Contracts are reviewed annually to ensure they provide.
6.5.6(a)(4) maintain the safety of the distribution system through the supply of standard control services.	<ul style="list-style-type: none"> Contracts established for the support of security systems and CCTV capability for transmission and distribution substations. Support agreements for applications required to inspect asset condition & plan condition based maintenance. Support of outage management applications. 	<ul style="list-style-type: none"> Security systems and associated technologies support the safety of Endeavour Energy’s distribution network.

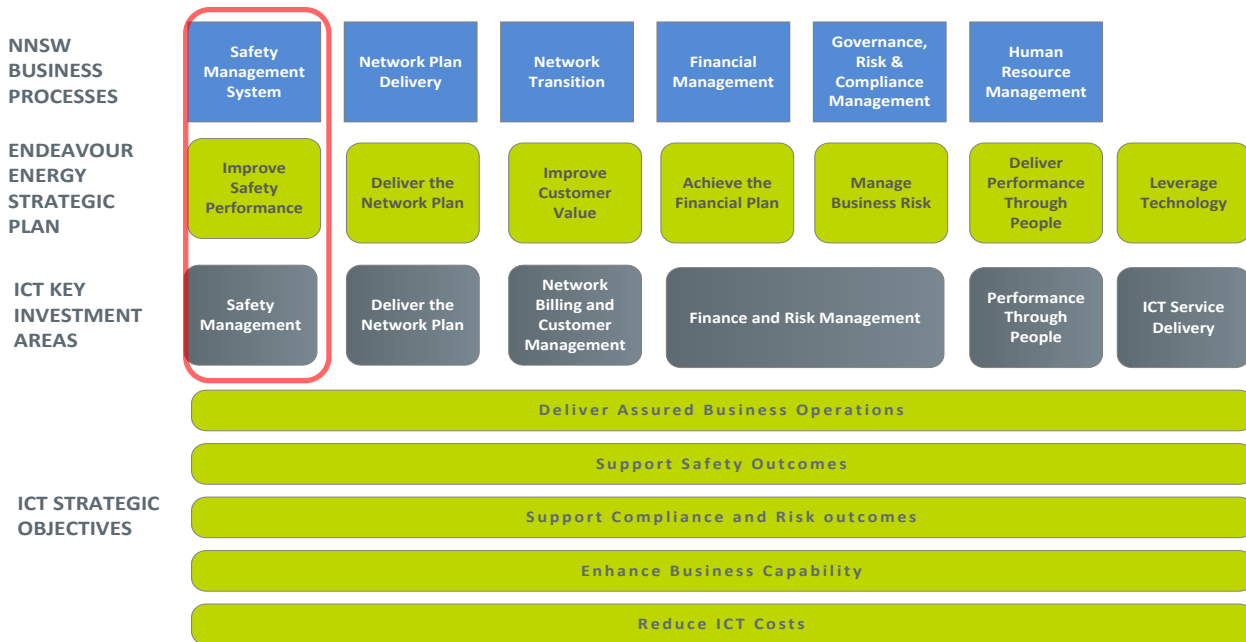
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SAFETY MANAGEMENT

Background or Overview

Support of Health and Safety objectives contained within the Health, Safety and Environment Implementation Plan is a critical element of the ICT Investment Plan for the 2015-2019 AER Submission. The following diagram shows the alignment between the Technology Plan to the Corporate Plan for Safety Management.

ALIGNMENT OF NNSW GROUP OBJECTIVES TO ENDEAVOUR BUSINESS AND ICT INVESTMENT PLAN



There are two major programs of technology investment required for Safety Management:

- Mandatory
- Assured Business Operations

Total investment of [redacted] non-recurrent capital expenditure over the next five years is required to deliver the investment portfolios needed by the business to achieve safety outcomes. A further [redacted] million of recurrent capital expenditure will be directed to ensure technical currency of existing systems to maintain current performance requirements cost effectively.

The following sections will outline the business context; describe the capital investment plan and the justification for the level of capital expenditure.

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Business Context

The intent of Endeavour Energy's Health and Safety strategic plan is to embed a safety culture within Endeavour Energy to enable all employees to take responsibility for the achievement of safety excellence.

Our key Safety Strategic Objective is to accept our personal responsibility to drive improvements in safety performance. Our target is to reduce incidents and injuries to an LTIFR (Lost Time Incident Frequency Rate) of less than 2.0 by 2015, on a pathway to zero, thereby positioning Endeavour in the top quartile of our industry within the next AER period.

Endeavour Energy's Health & Safety strategic plan is underpinned by four areas of strategic focus:

- Safety Leadership;
- Safety Science Education;
- Health and Safety Systems & Performance and
- Community Safety.

The Health and Safety strategic objectives for each focus area are:

Focus Area	Safety Leadership	Safety Science Education	Health and Safety Systems and Performance	Community Safety
Strategic Objectives	Build understanding of safety purpose, values and objectives.	Influence behaviour through safety training awareness.	Integrate safety processes into all aspects of our business.	Improve community safety outcomes.
	Develop safety leadership capability.	Build understanding of human factors.	Improve organisational health and safety performance.	Develop relationships with key external agencies
	Improve worker safety engagement / accountability.		Align health and safety audit processes with business systems.	

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Technology is a key enabler for the delivery of a number of Health and Safety Strategic initiatives to ensure that safety related training is delivered and recorded appropriately, safety information can be communicated, shared and delivered on time and that Health & Safety processes are effective and cost efficient.

During the last determination period, Endeavour Energy has effectively leveraged technology and redesigned processes to bring about cost efficiencies in the provision of Safety Management Services and to meet compliance obligations. This has been achieved through the consolidation of thirteen incident recording systems and manual processes into a single safety system 'MySafe' and the utilisation of workflow and process automation for incident notification, investigation and reporting.

The core systems currently used within our business to support the Health and Safety goals are:

- Ellipse for employee related information including training records and time and attendance;
- MySafe for incident management and reporting, safety observations and safety audit and compliance;
- Figtree for workers compensation;
- Extranet / Intranet for communication and training;
- Cognos for reporting and performance measurement;
- Business Management system for policies and procedures; and
- iSafe, which provides an emergency response function, navigation and GPS location in company-owned vehicles.

The core processes of Health & Safety are:

- Employee Health & Wellbeing including drug and alcohol testing, fatigue management, wellness programs and education;
- Operational Safety including workers compensation and advice and guidance on operational safety matters;
- Public Safety;
- Safety Compliance, including audit and investigation; and
- Safety Management Systems including development and communication of plans, actions & procedures to manage health & safety in the workplace.

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Business Drivers for Technology Investment

A critical objective of the Health & Safety strategic plan is “to continue to reduce the number of employee, contractor and public safety incidents and injuries controllable by our organisation to achieve a best practice safety outcome of “zero harm” in a cost effective manner. This increasing need to achieve better safety outcomes is driving the necessity for investment in technology and process redesign to:

- Assist employees and contractors to make safe choices by delivering cost effective and easily accessible online training and competency assessment programs which are integrated with employee training and contractor management records;
- Improve employee fitness for work by delivering mobile fatigue management software and online training for safety and wellness initiatives to allow managers, supervisors, employees and contractors to assess their levels of fitness for work;
- Improve health and safety management system by increasing access to safety information by integrating safety data from multiple processes and sources, including safety observations, incidents and audit results. Generating the ability to review and act on safety incidents and observations in a ‘real time’ environment by allowing access to real time safety data through mobile solutions;
- Integrate safety into business processes by delivering up-to-date hazard alerts; process related safety work method statements and field based safety auditing, investigation and training via a mobile solution and by extending MySafe to contractors, ASP’s and all persons undertaking work on behalf of Endeavour Energy;
- Integrate risk management and ICAM investigation results by incorporating safety self-verification, assessments and audit programs into MySafe and lower the risk of the occurrence of a serious incident through improved reporting capabilities based on a single source of up to date data which will allow the ability to develop ‘lead’ indicators, identifying trends and anticipating outcomes, leading to proactive preventative behaviour;
- Provide a rigorous risk management, audit and compliance framework by ensuring Health and Safety IT systems are technically current and meet the legislative requirements and that we maintain our self-insurer status for Workers Compensation;
- Address public safety risk exposure by provision of Public Safety Awareness programs and by educating the community about electricity hazards and risks via the internet and by providing a means for the public to report safety observations that are then integrated into the safety management system;
- Provide low cost of delivery of safety processes and outcomes by selection of technology re-use of existing systems and automating safety related processes; and
- Reduction of corporate costs that facilitate downward pressure on Network Tariff increases by automating highly manual processes.

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Investment Context

In the next five years Endeavour will leverage investment in its key safety management systems to drive continuous improvement and employee capability, educate and support workers in assessing and managing the health risks associated with fatigue and substance abuse and embed MySafe as a trusted source of safety data.

Safety management systems will be extended to contractors and ASP's to ensure the organisation's safety standards are met and will be delivered to the field through mobile technology.

A key success factor will be the ability to "mobilise" systems and data to ensure that staff can access and update safety information "anytime, anywhere, on any device". Whilst Ellipse and the Business Management System are expected to have technical upgrades within the 2015-2019 AER period there will be no changes to these systems to meet specific safety objectives.

Investment Roadmap

Initiatives included in the ICT Investment Roadmap for 2015-2019 have been selected on the basis that they are clearly linked to the priorities of the business; comply with NER capital guidelines, resource availability for each financial year and to provide benefits directly linked to the strategic objectives of the organisation. The cost is in thousands of dollars (\$'000) and includes total regulated and unregulated investment. (96% of this is attributable to standard control services.)

Networks NSW Category	Major Program	Program	2015	2016	2017	2018	2019
Risk	Fatigue Management	Roster Management, FAID score					
Risk	Safety Training	Learning Management system and e-learning module					
Risk	Safety Systems Enhancements	MySafe Process Improvement ASP & Contractor Portal Audit & Investigation Customer Portal Safety Reporting Enhancements					
Risk	Safety Systems Technical Currency Program	Figtree Upgrade					
		MySafe Upgrade					
Totals							

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NER Compliance

Investment in Safety management systems over the next five years is required to facilitate the education, monitoring and measurement of safety behaviour and maintain safety compliance across the business. The table below shows the justification of major programs for technology investment required to support Endeavour Energy's technical environment.

Mapping to the relevant "Capital expenditure objective(s)" (Chapter 6, National Electricity Rules) The forecasted capital expenditure is considered necessary to achieve:		
Guidelines	Major Program	Explanation
6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services.	<ul style="list-style-type: none">Fatigue ManagementSafety TrainingSafety Systems EnhancementsSafety Systems Technical Currency Program	The proposed expenditure for the Safety Management process seeks to drive safety of supply and customer safety through the delivery of safety systems, technology and training.

Prioritisation

Management of demand for ICT funding required consultation and agreement with the General Manager Health, Safety and Environment and Branch Managers with endorsement from the Executive Leadership Team. The key focus was to find the balance between recurrent expenditure needed to maintain high level of performance for current systems and functionality and to equip the business with new functionality needed to achieve strategic outcomes for safe, reliable and cost effective supply in constrained expenditure environment. Only those projects where "do nothing" was not an option have been included in the investment program. The result of this approach is 44% on safety system technical currency projects to deliver an assured business platform for operating the business and delivering supply. Only "improve" projects where positive benefits, improved risk mitigation, cost avoidance or cash savings can be realised within the 4 years of this review period have been included in the program.

Leveraging Past Investment

During the 2009-2014 determination period investment was made to implement Figtree and the MySafe applications, these applications form the technology basis of our Safety Management System. These investments will provide the basis for extending safety solutions to ASP's, Contractors and Customers through provision of mobile and web solutions, and will enable Endeavour Energy to develop reporting of lead indicators and improved analysis leading to a reduction in safety incidents.

Prudent Cost Management

The capital constrained environment has required Endeavour to look at capital efficient options to meet the critical needs of the business. The architectural principles that will be applied to achieve the required capital expenditure outcomes are as follows:

- Capital expenditure forecasts have a high reliance on re-using existing systems and their functionality to reduce the level of capital investment required to support the business in

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achieving operational and strategic objectives over the next five years. For example, where new functionality is not available in house, COTS software will be sourced through market testing to provide cost effective solutions and

- Development of new functionality will be limited where possible to web frontends to support mobility and process automation using common architectural frameworks to contain capital development and project costs.

Opportunities to leverage the power of Network NSW are limited in this investment area due to the differences in technology stacks and linked business processes do not readily lend themselves to sharing services and joint procurement. However, ICT will follow the lead from the business which has shared engineering standards and joint procurements exercises to leverage lessons learnt in mobility to reduce project delivery timeframes and establish common architectural frameworks.

Strategic Objective Alignment

Investment in technology will be targeted to facilitate the achievement of the following strategic objectives for safety:

- Influence behaviour through safety training awareness;
- Integrate safety processes into all aspects of our business;
- Improve organisational health and safety performance;
- Align health and safety audit processes with business systems; and
- Improve customer safety outcomes.

The table below links the strategic objectives of Health & Safety to investment initiatives:

Strategic Objective	Business Drivers	Investment Initiatives	ICT Program
Influence behaviour through safety training awareness.	<ul style="list-style-type: none"> • Assist employees and contractors make the safe choice. • Improve employee fitness for work. • Improve safety expertise of frontline leaders. 	<ul style="list-style-type: none"> • Training and education material delivered via web technology to build safety awareness for contractors, ASPs and public safety awareness for electrical hazards. • Delivery and tracking of online safety training with integration to corporate learning management systems. 	<ul style="list-style-type: none"> • Safety Training. • Fatigue Management.
Integrate safety processes into all aspects of our business.	<ul style="list-style-type: none"> • Improve our health and safety management system. • Integrate safety into business processes. 	<ul style="list-style-type: none"> • Increasing the use of mobile solutions and integration to mobile devices for safety initiatives such as fatigue management, safety audit and investigation and field based delivery of safety work method statements and 	<ul style="list-style-type: none"> • Safety Systems Enhancements. • Fatigue Management.

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Strategic Objective	Business Drivers	Investment Initiatives	ICT Program
		<ul style="list-style-type: none"> hazard alerts. Mobile delivery of fatigue assessment capability and extension of initiatives to contractors and ASPs. Mobile safety solutions will utilise standard devices and network connectivity as implemented through the organisation's field force automation / mobility strategy solutions. Leverage workflow and integration tools that will support the safety processes. The online timesheet solution will be implemented in 2014/15 allowing up to date actual hours of work information to be extracted for fatigue assessment 	
Improve Organisational health and safety performance.	<ul style="list-style-type: none"> Integrate risk management and ICAM investigation results 	<ul style="list-style-type: none"> Integration of safety self-verification and assessments and audit programs into MySafe Continued education and refresher training in safety practices 	<ul style="list-style-type: none"> Safety Systems Enhancements Safety Training
Align health and safety audit processes with business systems	<ul style="list-style-type: none"> Provide a rigorous risk management, audit and compliance framework. 	<ul style="list-style-type: none"> Enhanced Health and Safety reporting from integrated safety systems using real time and historical data – dashboard reporting and lead indicators. Ensuring technical currency of Figtree workers compensation claims management system. Improved integration between MySafe and Figtree. 	<ul style="list-style-type: none"> Safety Systems Enhancements. Safety Systems Technical Currency Program.
Improve Community Safety Outcomes	<ul style="list-style-type: none"> Address public safety risk exposure. Provide public safety education and awareness programs. 	<ul style="list-style-type: none"> Web based mechanisms to allow customers and the general public to report safety related observations and incidents which integrate to MySafe. Safety education programs communicated via 	<ul style="list-style-type: none"> Safety Systems Enhancements.

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Strategic Objective	Business Drivers	Investment Initiatives	ICT Program
		Endeavour Energy's internet site and other digital formats.	

Capital Investment Programs

The following section outlines the four major safety management programs:

- Fatigue Management;
- Safety Training;
- Safety System Enhancements; and
- Safety Systems Technical Currency Program.

Fatigue Management

Investment in technology is required over the next AER period to ensure that fatigue is adequately managed at Endeavour Energy and that controls are in place to eliminate the foreseeable risk of an accident caused by fatigue. Technology is expected to automate and support the processes to avoid the increased cost of human effort required to record and analyse rosters, schedules and personal fatigue assessments.

The Fatigue Management program will deliver:

- A mechanism for performing assessments and recording the FAID Analysis results of the standard roster, shift and individual fatigue assessments that will provide notification and escalation procedures under pre-defined (but configurable) conditions;
- Fatigue Management reports including management reports and exception reports;
- A mechanism to record and report actual hours worked in accordance with FAID analysis requirements;
- Development of an extract or reporting capability that will provide information on actual hours worked and time of day to allow for FAID analysis; and
- Roll out of a mobility solution for individual fatigue assessment.

Roster Management and Fatigue Assessment software is not yet implemented at Endeavour.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> • Do nothing option is not acceptable as the safety risks and legislative requirements associated with fatigue management will not be addressed. Endeavour Energy will be unable to meet the requirements of the Work Health and Safety Act 2011 (NSW) and Work Health and Safety Regulation 2011 (NSW) with regards to fatigue management. The additional risk of an accident occurring

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	due to the lack of adequate fatigue management exposes Endeavour to safety and financial risk and Endeavour will fall short of meeting its obligations with regards to providing a safe work place for its employees. This option is not considered economically viable in the event of a significant incident where Endeavour would be required to pay penalty, compensation and rectification expenses as well as investment in repairing the associated reputational damage.
Software as a Service	<ul style="list-style-type: none"> A software as a service solution is not considered viable as there is a lack of SaaS Fatigue related solutions in the market. Additionally, the information required for fatigue management is tightly coupled with employee leave, rostering and attendance information which is held on internally hosted applications.
Buy / Build	<ul style="list-style-type: none"> The control room has conducted market testing on a Roster Management and Fatigue Assessment tool which meets stated requirements at corporate level. This option will be investigated further for suitability to the whole organisation.
Preferred case	<ul style="list-style-type: none"> Buy / Build is the preferred option as there are a number of suitable tools in the marketplace and integration to existing internally hosted systems will be complex.

Due to the specific rostering and working conditions needed to drive a fatigue management tool and the requirement to tightly integrate to time and attendance data, Endeavour Energy specific award conditions, leave data and payroll, the preferred option for delivery is to buy or build. The primary costs associated with this program of work assume the purchase of new software in addition to the use of external vendors for configuration and integration of this solution to the existing HR, time and leave management system (Ellipse) within the solution set. Additional hardware costs are not expected as the software application is expected to be “virtualised” within the existing infrastructure framework. The costs for Fatigue Management have been derived using the following rationale:

- Software purchase costs have been estimated based on market testing and the subsequent quotes received to implement a roster based management system for Endeavour Energy’s Control Centre. Costs have been extrapolated to take account of implementation to all key areas of the business;
- Hardware purchase costs are not included as an assumption has been made that the new application can be “virtualised” within existing infrastructure;
- Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission; and
- Market testing and project costing, based on detailed requirements, will be undertaken in year 2 of the AER period as part of developing the detailed business case.

This solution will be implemented midway through this AER determination period and operational expenditure impacts such as licencing and support costs will be incurred in the last 2 years of AER determination.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Fatigue Management program will be commence after the Workforce Scheduling program, with the major work being completed in

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parallel to support the standardisation of rostering and work scheduling to manage fatigue. There is also a requirement to mobilise fatigue management and this ties in with the Mobility Infrastructure program and Automation of Timesheet program.

Program	Runs in Parallel with:	Supported by:	Supports:
Fatigue Management	Workforce Scheduling	Mobility Infrastructure	Automation of Timesheets

The expected benefits of compliance to legislation, risk reduction, optimisation of work scheduling and reduction in safety incidents due to fatigue will be realised from 2016/17 onwards.

Safety Training

Investment in web technology will support the development of safety awareness and influence safety behaviours by delivering online safety training and educational materials to employees, contractors, ASPs and the Public.

The first year of the program includes the development of an e-learning/Learning Management System (LMS) portal for hosting online training & integration to the training management system. An assumption of 10 weeks per year during the AER determination period has been made to develop and rollout specific modules to employees, contractors and vendors.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Do nothing option is not acceptable. Safety training <u>must</u> be carried out and the “do nothing” option will require all training to be “face to face” and the bookings and results to managed manually. This option is not considered to be economically justifiable as the total cost of “face to face” training is prohibitive due to the cost of provisioning training facilities and resources, logistical planning of removal of crews from the field and the loss of productivity during this time.
Software as a Service	<ul style="list-style-type: none"> Software as a service may be considered for the hosting of the E-learning modules but Endeavour Energy has the web capability to host.
Buy / Build	<ul style="list-style-type: none"> A custom built employee portal (which is a custom built front end to the Ellipse ERP system) will include ESS/MSS and training management functionalities is currently in design phase and will be implemented in the 2014/15 financial year. It is not economical to buy or build a separate system for safety training.
Enhance Existing systems	<ul style="list-style-type: none"> The Employee Portal is currently in design stage and will deliver basic training management functionality. This system will be enhanced to provide more advanced capabilities and interfaces for safety training.
Preferred case	<ul style="list-style-type: none"> Enhance existing software is the preferred option as it represents the most economically efficient option, leveraging on the existing investment in training systems via the employee portal.

As a new organisation wide learning management system will be delivered as part of the Employee Self Service portal, has been targeted for implementation in 2014/15 under the

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Performance through People program of work, the Safety Training program of work will leverage the existing investment as a foundation for integrating safety training management and the delivery of safety related training modules.

The costs for the Safety Training program of work have been derived using the following rationale:

- An assumption has been made that no additional software costs will be required and that the development of new training modules are included in configuration costs;
- New interfaces are expected to ensure the capture and integration of training nominations, training attendance and competency results; and
- Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission. The model applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

The new interfaces and e-learning portal are expected to be implemented in the first and second years of the AER period. Associated operational impact's such as uplift in support costs will be expected from the second year onwards. It is not expected that the development of training modules will result in operational cost impacts other than depreciation.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Safety Training program will be commence before the Learning Management System (LMS) process enhancements program and is well positioned to support development in this program with reuse of interfaces and learning portals.

Program	Runs in Parallel with:	Supported by:	Supports
Safety Training			Learning Management System (LMS) Process enhancements

The expected benefits of compliance to safety training and competency requirements, risk reduction, reduction in face to face training costs and reduction in safety incidents are expected to commence after the second year of the AER period.

Safety System Enhancements

The Safety Systems Enhancement program is focused on ensuring that Endeavour Energy's Safety systems enable the organisation to meet its Health and Safety strategic objectives. The program includes:

- Process improvement initiatives to the MySafe and Figtree applications as distinct from technical currency initiatives;
- Extension of initiatives to ASPs and contractors;

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- Enhancing the mobile experience;
- Automated audit and investigation including the integration of safety self-verification and assessments and audit programs;
- Providing web based mechanisms to allow customers and the general public to report safety related observations and incidents which integrate to MySafe; and
- Development of new safety reports and reporting mechanisms, integrating information and data from multiple systems, providing for detailed analysis and lead indicator reporting.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">• Do nothing option will fail to achieve required cost savings in the management of safety incidents and will fail to address risk of not meeting safety objectives for the organisation. Doing nothing means that Endeavour will not meet the legislative requirements of the Work Health and Safety Act 2011 (NSW) and Work Health and Safety Regulation 2011 (NSW). This option is not considered economically justifiable due to the missed opportunity of realising safety cost savings. The current process of managing and reporting safety is highly manual. The production of reports, consolidation of information from systems is done manually and is highly resource intensive. The cost savings are targeted at implementing improved functionality to automate reporting and therefore reduce labour costs as well as to provide lead indicators to develop preventative safety programs with the objective of minimising or eliminating post incident expenditure through preventative management and safety awareness.
Buy/Build	<ul style="list-style-type: none">• New software will present an extra cost to the organisation and is not seen to be an efficient use of capital.
Enhance existing software	<ul style="list-style-type: none">• The current Safety system (MySafe) is a recent investment and its full functionality has not yet been realised. The planned enhancements are primarily related to fully developing interfaces to other systems and utilising the mobile capabilities of the existing system.
Preferred case	<ul style="list-style-type: none">• Enhance existing software is the preferred option as it represents the most economically efficient option, leveraging on the existing investment in safety systems.

Costs have been derived using the following rationale:

- There are no additional software or hardware costs associated with this program of work as current safety systems meet existing needs and are capable of being enhanced and upgraded through configuration and system upgrades and
- Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission. The model applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

The safety system enhancements are a program of recurrent expenditure with the majority of investment in the first 2 years of the AER determination period. As the program is based on

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enhancements to existing systems, operating expenditure impacts will be minimal and likely based on any uplift in current support costs due to the nature of the changes in functionality. Operational expenses associated with the changes are expected to commence in the second year of the AER determination period, increase in the third year and stabilise in the subsequent years.

The expected benefits of reduction in operation costs for administration increase in data integrity, reporting of lead indicators and improved analysis leading to a reduction in safety incidents are expected to commence in the second year of the AER period.

Safety Systems Technical Currency Program

The Safety Systems Technical Currency program is focused on ensuring the technical currency of the Key Health and Safety systems; MySafe and Figtree.

1. Figtree Upgrade

A major rewrite of the Figtree Workers Compensation and Claims module will be available in the market towards the end of the 2013/14 financial year. Endeavour Energy will commence planning for the upgrade in 2014/15 with implementation expected in 2015/16. The new version will allow for enhanced reporting using Endeavour Energy's corporate reporting tool (Cognos), web based access and significant improvements to functionality. However, the new version will only be offered as a hosted solution. Further investment is expected in 2017/18 for enhanced integration relating to the MySafe and Ellipse upgrades.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">Do nothing is not considered a viable option as the Figtree software is pivotal to the management and reporting of workers compensation claims. Not maintaining technical currency of this application would jeopardise Endeavour Energy's position as a self-insurer in the event of application failure or inability to comply with WorkCover requirements. This option is not considered economically justifiable due to the increase in cost if Endeavour Energy were no longer self-insured. The current self-insurance license is calculated at 0.96% of the payroll versus 1.83% of the payroll if Endeavour was no longer self-insured. This represents almost 50% increase in premiums for Endeavour Energy with a non-self-insured Workers Compensation status.
Upgrade and move to hosted solution	<ul style="list-style-type: none">Provides the potential to re-negotiate the software licence and support agreements. As the Figtree system has been used at Endeavour Energy since 2009 and is the major software vendor in the Workers Compensation Industry, upgrades automatically incorporate WorkCover legislative changes into new versions of the software, resulting in less development work to be funded solely by Endeavour Energy in the event of legislative changes.

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Preferred case	<ul style="list-style-type: none"> Upgrade and move to hosted solution is the preferred option. Technical upgrades will enable Endeavour Energy to comply with WorkCover legislation requirements and maintain its position as a self-insurer. Through moving to a hosted solution, support costs will be reduced and further patch upgrades will become simpler and more cost effective.
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Costing of the project has been based on:

- An assumption that as the new solution will be hosted, there will be no additional software costs and
- Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission.

2. MySafe Upgrade

The MySafe incident management application, implemented in the 2012/13 financial year, will undergo a number of enhancements to introduce more and more functionality to other parts of the business and integrate safety observations from the Public, Customers, Contractors and ASP's into the incident management system. The MySafe Upgrade program will invest in streamlining existing processes, ensuring compliance to Work Health and Safety regulations and includes a technical upgrade of the software in the 2017/18 financial year.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Do nothing is not considered a viable option as the MySafe software is pivotal to the management and reporting of safety incidents. Not maintaining technical currency of this application would jeopardise Endeavour Energy's safety culture and will introduce risk of not meeting safety objectives for the organisation. Endeavour Energy will be unable to meet the requirements of the Work Health and Safety Act 2011 (NSW) and Work Health and Safety Regulation 2011 (NSW) with regards to customer and public safety. Endeavour will fall short of meeting its obligations with regards to providing a safe environment for its employees, 3rd parties, customers and the public. This option is not considered economically viable in the event of a significant incident where Endeavour would be required to make penalty, compensation and rectification payments as well as investment in repairing the associated reputational damage.
Upgrade to maintain Technical Currency of the Application	<ul style="list-style-type: none"> Technical upgrades will enable Endeavour Energy to comply with WHS regulation and address safety risks without significant investment in new systems.
Preferred case	<ul style="list-style-type: none"> Upgrade to maintain Technical Currency of the Application.

Costing of the project has been based on:

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- An assumption that as the MySafe application was only implemented in 2012/13 it will continue to be the organisation's incident management system for some time. As such there will be no additional software costs as upgrades will be covered by the current licence and support agreements and
- Configuration, customisation and integration costs have been estimated using a standard estimation model applied to all projects within the submission.

The upgraded version of Figtree will only be offered as a hosted solution. Overall the expenditure impacts of the upgrade are likely to be minimal but the type of support agreements in place will be restructured. The current support agreements are shared between CGI and the Figtree vendors. It is expected that the hosted arrangement will increase the support costs to Figtree but reduce the level of support provided by CGI and the in house maintenance and support of the Progress database will be removed.

The MySafe upgrades are factored in to the existing licencing agreements. The support model for the maintenance and support of the application is in the process of being restructured and will be completed in the 2013/14 financial year. No further impacts to operational expenses are expected.

The expected benefit of continued compliance to WHS legislation and WorkCover requirements will be realised immediately upon implementation of the upgrades in 2015/16 and 2017/18. The benefits of increased integrity and timeliness of data and the reduction on manual data entry and compliance costs will be progressively achieved throughout the AER period as enhancements are implemented.

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Benefits

To identify the success of return on investment, a benefits management plan has been established for each initiative. The table below lists the key initiatives with the indicative cost and associated benefits. The cost is in thousands of dollars (\$'000) and includes regulated and unregulated investment.

Program Title	Program Description	Total Cost	Business Benefits
Fatigue Management	<ul style="list-style-type: none"> • Mobile delivery of fatigue assessment capability to individuals and extension of initiatives to contractors and ASPs. • Automated capture of data to facilitate the assessment and management of fatigue. Will include data capture, integration and reporting systems. • Elimination of manual documentation • Streamlining and automating processes involved in assessing rosters, work schedules and individual fatigue levels • Automated workflow and escalation. 		Risk Mitigation <ul style="list-style-type: none"> • Improve data quality and compliance • Process improvement to reduce manual data entry for field employees and work schedulers • Ability to optimise work schedules and allocate resources • Increase in data integrity, timeliness and auditability. • Reduced risk of safety incident occurring due to fatigue • Proven compliance to WHS guidelines • Enable shift for managers from administrative time to management of safety.
Safety Training	<ul style="list-style-type: none"> • Development of e-learning solutions and integration to enable automatic recording of training results into LMS. • Ability to access e-learning safety related training programs remotely and via mobile devices • Automation of safety training management activities such as training nomination, scheduling and recording of results. 		Risk Mitigation <ul style="list-style-type: none"> • Improve compliance and data quality through process improvement to reduce manual data entry of training nominations and results for both training administration staff and branch administration staff • Increased compliance to safety training and competency requirements • Reduction in face to face training costs • Ability to optimise work schedules and allocate resources through flexible training scheduling and minimise impact to time on tools. • Supports treatment actions for safety risks and reduces risk of a "fatality/serious injury to employee or member of the public" • Ensures only authorised personnel work on the network • Enables use of lead indicators provided through increased reporting of near misses and safety incidents in order to lower LTI's.

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<p>Safety System Enhancements</p>	<ul style="list-style-type: none"> • Process improvement requirements, particularly with regards to integration with other systems • Enhanced reporting solutions that leverage additional information captured by MySafe and focus on lead indicators to enable the management and mitigation of safety risks • Development of online customer reporting system for minor electrical shocks, safety observations and other incidents to replace the current manual recording system through the call centre • Integration of customer and public safety observations and incidents into MySafe • Extension of initiatives to ASPs and contractors and • Enhancing the mobile experience • Integration of safety self-verification and assessments and audit programs. 	<p>Risk Mitigation</p> <ul style="list-style-type: none"> • Improved data quality through process improvement to reduce manual data entry • Increase in data integrity, timeliness and auditability due to single source and entry • Providing real time information on safety information and hazard alerts • The ability to identify Lead Indicators and trends resulting in proactive actions to avoid injuries and incidents ultimately reducing the LTIFR • The ability to identify public hazards, resulting in proactive actions to avoid injuries and incidents to the public, ultimately reducing the external SENI (serious electrical network incident) rate.
<p>Safety Systems Technical Currency Program</p>	<ul style="list-style-type: none"> • Maintain technical currency of the MySafe and Figtree application • General enhancements to meet work cover and regulatory requirements 	<ul style="list-style-type: none"> • Cost avoidance of increased ICT support costs <p>Risk Mitigation</p> <ul style="list-style-type: none"> • Compliance to WHS legislation • Support from the vendor with new features and enhancements • Continued compliance to WorkCover legislation.

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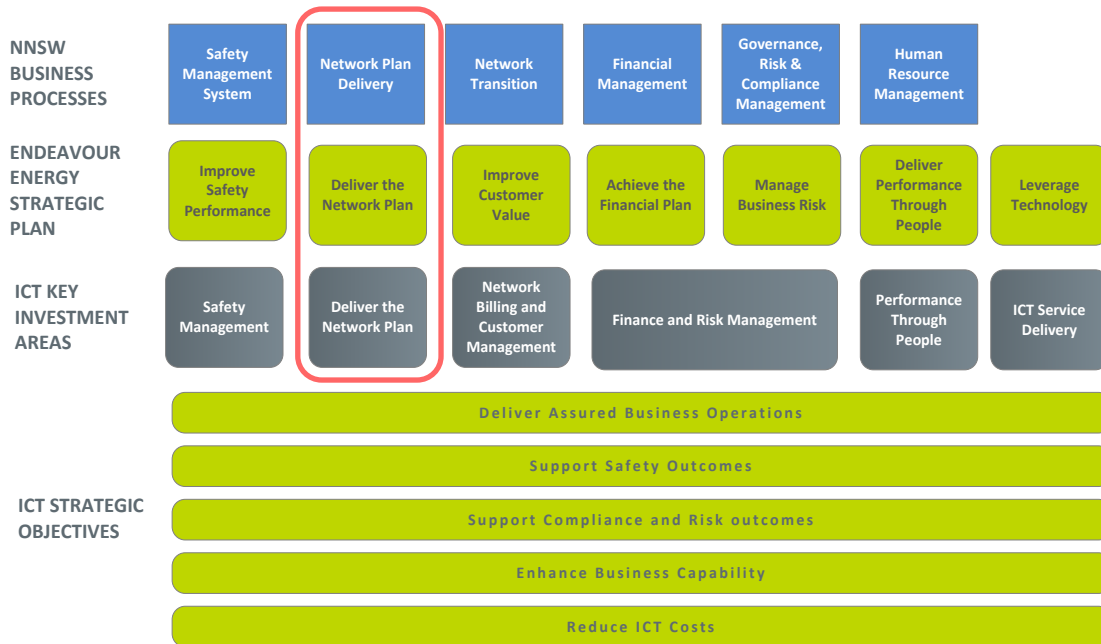
DELIVER THE NETWORK PLAN

Background or Overview

Deliver the Network Plan is one of six Endeavour Energy's strategic objectives which are fundamental to achieving our business outcomes. Investment in technology is crucial to support Network Supply Strategy objectives and is a key objective for the ICT Investment Plan for the 2015-2019 AER submission.

The following diagram shows the alignment between the Technology Plan to the Corporate Plan for **Deliver the Network Plan**.

ALIGNMENT OF NNSW GROUP OBJECTIVES TO ENDEAVOUR BUSINESS AND ICT INVESTMENT PLAN



There are three major programs of technology investment required to deliver the Network Plan. They are:

- Strategic / Improve - Network Asset Management;
- Improve - Process Automation and Mobile Crews; and
- Risk - Assured Business Operations (Support and maintenance of existing systems and functionality).

Total investment of [REDACTED] non-recurrent capital investment over the next five years is required to deliver the three major investment portfolios needed by the business to achieve business outcomes. A further [REDACTED] of recurrent capital expenditure will be directed to technical currency of existing systems to maintain current performance requirements cost effectively.

The following sections will outline the business context; describe capital investment plan and the justification for the level of capital expenditure.

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Business Context

Delivery of the Network Plan is one of Endeavour Energy's core strategic plans and is outlined in detail in the Network Supply Strategy. The key objective of Network Plan is the achievement of the group strategic objective of efficiently distributing electricity to our customers in a safe, reliable and sustainable cost effective way and is delivered through the four key processes of Plan; Design and Construct; Operate and Maintain. These are defined as:

- *Plan* – the identification of new and existing assets required to meet current and future demands for the supply of electricity as outlined in the Strategic Asset Management Plan (SAMP);
- *Design and Construct* – Network assets are designed and constructed to provide an electrical network that meets the stakeholders' current and future supply of electricity needs;
- *Operate* – the management of planned and unplanned outages to ensure safe and rapid restoration of supply to customers and minimise impact to the electrical network; and
- *Maintain* – the proactive and reactive maintenance of assets to deliver a high level of reliability safely and cost effectively for high and low voltage network.

Core systems critical to the efficient and effective operation of these processes are:

- Ellipse ERP system for integration of the asset register, asset maintenance management system and corporate accounting systems to enable tangible links between asset performance and asset worth:
 - Ellipse provides critical data feeds to the key business systems of GIS, OMS and SCADA required for the operation and maintenance of the distribution and transmission network;
 - Network asset data loaders have been built to improve the quality and timeliness of data capture processes to corporate systems;
 - The Ellipse Equipment Register is an equipment management system which stores data on all power assets and allows tracking of the various transferable assets such as transformers; and
 - The Ellipse Works Management System utilises work requests, work orders and standard job estimates to track and manage all construction, refurbishment and maintenance;
- The Geographical Information System (GIS) records, stores and enables the retrieval of spatial and geographical information about Endeavour Energy's electricity assets. The GIS is integrated with the Ellipse Equipment Register and Works Management Systems to allow the display of works information geographically;

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- The Field Inspection System (FIS) is a mobile system for the routine inspection of Endeavour Energy's poles and power lines. The FIS provides inspectors with the relevant information for them to be able to find and validate pole details, create new poles; record inspection measurements; close existing open work orders and raise new defect work orders. This information is retrieved from (and loaded back into) the Ellipse and GIS systems;
- The Outage Management System (OMS) provides information for the management of system outages and emergency response to customers within the Endeavour Energy franchise area and the provision of data for the reporting on network reliability. It is a business critical, high availability (24x7), real time system composed of customer call data, automatic fault reporting from SCADA, geo-spatial, network design and other data sources to manage network outages and to reduce outage duration;
- Project Portfolio Management System (PPMS) provides construction project managers the information and functionality to allocate work, maintain financial control, track progress to milestones and track project issues;
- Distribution Network Information System (DINIS) is a network analysis tool for the electrical analysis of the transmission, sub-transmission and High Voltage (HV) distribution networks used for reliability planning, network protection and daily network planning functions;
- Customer Application Management System (CAMS) manages the safe and cost effective connection of gifted assets to the high voltage network in accordance with company standards; and
- CAD has been designed and implemented to automate the network asset design and submission processes.

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Business Drivers for Technology Investment

Investment in technology for the delivery of the network plan is driven by a number of changes in business priorities and work practices:

- Delivering improved customer reliability through better asset utilisation drives the investment in improved data quality, data management and data analytics to maintain the quality, reliability and security of the assets and the services they provide;
- Embedded generation trending toward two directional power flow, dramatically increases the complexity of managing, operating and maintaining a network originally designed for one-way power flow. This drives the need to create management systems to monitor, collate and analyse data from various network monitors and data points to ensure power quality and safety can be maintained;
- The adoption of a risk optimised and commercially responsible asset management approach is a critical factor to the successful delivery of a capital efficient Network Supply Strategy. This approach aims to deliver reliability targets, but where appropriate, defer investment in network augmentation. This deferral of capital expenditure drives the need for IT investment in the integration of operational technology and information technology data to better understand the network's resilience to environmental impacts and improve the efficiency and effectiveness with which the network asset is operated;
- Increased safety performance for all workers, contractors and members of the community is driving the need for technology enabled solutions with a greater dependency on real time quality data to support decision making;
- Capital cost pressures are forcing the change from time based maintenance of network assets to more cost effective risk and condition based maintenance (RCBM). This change drives the investment in technology to include new functionality and capability to collect, store and analyse historical and condition based data; and
- Operational cost pressures are forcing the replacement of manual administration tasks and field support tasks with automated and mobile technology. This drives the investment in business process and field force automation for both office and field workers to initiate and complete tasks from generating work orders and leave requests to approvals, booking of training and access to information for entitlements and career development opportunities.

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Investment Context

The investment plan for technology in the delivery of the network plan over the next five years supports the reliable distribution of supply, the changes in the management of reliability and the greater use of smart grid technology to achieve lower capital and operating costs.

As a result of consultation and prioritisation in a capital constrained environment, three major programs are required to support delivery of the Network Plan. They are:

- Network Asset Management;
- Process Automation and Mobile Crews; and
- Assured Business Operations (Support and maintenance of existing systems and functionality).

Within each major program are a number of programs of work which focus on business sub processes and their related technology to deliver business outcomes. These programs of work have been classified using the Network NSW capital investment criteria.

Investment Roadmap

Initiatives included in the ICT Investment Roadmap for 2015-2019 have been selected on the basis that they are clearly linked to the priorities of the business; comply with NER capital guidelines, resource availability for each financial year and to provide benefits directly linked to the strategic objectives of the organisation. The cost is in thousands of dollars (\$'000) and includes total regulated and unregulated investment. (96% of this is attributable to standard control services.)

Networks NSW category	Major Program	Program	2015	2016	2017	2018	2019
Strategic	Network Asset Management	Low Voltage Control Management					
		Integrate OT and IT Information					
Risk	Network Asset Management	Risk and Condition Based Maintenance					
		OMS Data Mart Upgrade					
		Replace Network Load History Data Stores					
Improve	Process Automation and Mobile Crews	Field Force Automation					
		Workforce Scheduling					
Risk	Assured Business Operations	Asset Management Technical Currency					
		OMS Application Upgrade					
		PPMS Upgrade					
		DINIS Replacement					
Totals							

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NER Compliance

Investment in Endeavour Energy systems over the next five years is required to deliver supply and to support compliance of business processes to meet regulatory and market requirements. The table below shows the comparison and justification of major programs for the technology investment required to support the delivery of the network plan for Endeavour Energy.

Mapping to the relevant “Capital expenditure objective(s)” (Chapter 6, National Electricity Rules) The forecasted capital expenditure is considered necessary to achieve:		
Guidelines	Major Program	Explanation
<p>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</p> <p>(i) the quality, reliability or security of supply of standard control services [prescribed transmission services]; or</p> <p>(ii) the reliability or security of the distribution system through the supply of standard control services [prescribed transmission services],</p> <p>to the relevant extent:</p> <p>(iii) maintain the quality, reliability and security of supply of standard control services [prescribed transmission services] and</p> <p>(iv) maintain the reliability and security of the distribution [transmission] system through the supply of standard control services;</p>	<ul style="list-style-type: none"> Network Asset Management 	<ul style="list-style-type: none"> The proposed expenditure for this portfolio seeks to deliver customer reliability through improved data quality, management and analytics of assets and services to improve productivity and reliability through improved decision making and data quality.
	<ul style="list-style-type: none"> Process automation and Mobile Crews 	<ul style="list-style-type: none"> The proposed expenditure seeks to drive the management of efficient and sustainable network through automation of business processes for field workers and provision of real time data and integration to corporate systems as part of field maintenance and inspection processes, resulting in reduced operational expenditure, through maintaining labour costs at or below CPI and improved quality and reliability of asset data.
	<ul style="list-style-type: none"> Deliver Assured Business Operations 	<ul style="list-style-type: none"> The ICT Investment strategy for the Deliver the Network Plan sub process is to provide technical currency for critical systems and tools and to invest in technology to automate processes and improve quality data to support network strategic objectives of managing the network sustainably and cost effectively to meet customer reliability standards.
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services.</p>	<ul style="list-style-type: none"> Network Asset Management 	<ul style="list-style-type: none"> The proposed expenditure for the asset management process seeks to drive safety of supply and customer use through the creation of management systems to monitor, collate and analyse data from network monitors and data points

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Prioritisation

Management of demand for ICT funding required consultation and agreement from the three General Managers in the Network Business with endorsement from the Executive Leadership Team. The key focus was to find the balance between recurrent expenditure needed to maintain high level of performance for current systems and functionality and to equip the business with new functionality needed to achieve strategic outcomes for safe, reliable and cost effective supply in a constrained expenditure environment. Only those projects where “do nothing” was not an option have been included in the investment program. The result of this approach is 46% on technical currency projects for asset management applications to deliver an assured business platform for operating the business and delivering supply. Only “improve” projects where positive benefits, improved risk mitigation, cost avoidance or cash savings can be realised within the 4 years of this review period have been included in the program.

Leveraging Past Investment

Since 2000, the investment in technology has supported the asset-centric network strategy that was focused on managing three key indicators of network performance - load at risk, reliability performance and remaining asset life to deliver business outcomes. As a result the core processes of plan, construct, maintain and operate have been shaped by the Integrated Asset Management Information Strategy (IAIMS) and investment roadmap that delivered the key integrated systems of geographic asset information (GIS), work asset management system (Ellipse), and outage management (OMS). Endeavour has continued to invest in technical upgrades for each of these core systems to mitigate risk to business operations and to leverage functionality enhancements delivered with major software releases.

This investment approach has allowed Endeavour to continue to enhance and integrate these core systems with mobility and satellite systems to achieve business productivity improvements and improve data quality as an input to strategic decision making in a capital efficient manner. These core systems will continue to operate as the database of record and support the move from time based maintenance to conditioned based asset maintenance processes. A key investment in the current AER period was the delivery of the high availability infrastructure for outage management to reduce planned system outages required for release management of applications and infrastructure upgrades. This platform provides the business with the ability to cost effectively move other critical applications or solution components for outage management and defect management to the high availability environment to achieve reliability and safety targets.

Prudent Cost Management

The capital constrained environment has required Endeavour to look at capital efficient options to meet the critical needs of the business. The architectural principles that will be applied to achieve the required capital expenditure outcomes are as follows:

- Capital expenditure forecasts have a high reliance on re-using existing systems and their functionality to reduce the level of capital investment required to support the business in achieving operational and strategic objectives over the next five years. For example, new functionality for risk based maintenance and work scheduling will aim to use modules in Ellipse to deliver a cost effective solution to the business;

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- Development of new functionality will be limited where possible to web frontends/portlets to support mobility and process automation using common architectural frameworks to contain capital development and project costs.

To reduce operating expenditure and improve technology service delivery to business leaders and users, during the next five years, ICT will secure best quality/best cost application and business support services through market testing as well as exploiting “the power of three”. In the last year of the current AER period new outsource contracts were executed to secure specialist application vendors for outage management and geospatial.

Strategic Objective Alignment

Investment in technology is critical to meeting customers’ reliability needs; servicing growth in demand and managing the network safely and sustainably and to enable achievement of the overall objective of controlling increases in network tariffs to no more than the rate of increase in the Consumer Price Index. The table below links the strategic objectives from the Network Supply Strategy with the ICT investment initiatives.

Strategic Objectives	Business Drivers	Investment Initiatives	ICT Program
Managing customers’ reliability needs	Drive customer reliability through improved data quality, management and analytics of assets and services.	<ul style="list-style-type: none"> • Detailed, accurate outage and asset data and performance metrics. Greater access to real time information for outage management. • Investment in multi-source information stores and data mining tools to support decision making for asset replacement based on actual experience, data and analysis of expected remaining life and likely failure modes. 	<ul style="list-style-type: none"> • OMS Application. • Upgrade Risk and Condition Based Maintenance. • OMS Data Mart Upgrade. • Replace Network Load History Data Stores.
Service growth in demand	Manage growth in service demand through creation of management systems to monitor, collate and analyse data from network monitors and data points.	<ul style="list-style-type: none"> • More regular updates for changes to the low voltage distribution network held in OMS, GIS and Ellipse to feed into the distribution network planning model, facilitating decision making for network augmentation and maintenance scheduling. • Increased volume of asset data collected, available for analysis and input into the planning tool set. 	<ul style="list-style-type: none"> • Low Voltage Control Management. • PPMS Upgrade. • DINIS Replacement. • Integrate OT and IT.

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Manage the network efficiently and sustainably	Drive the management of efficient and sustainable network through automation of business processes and field workers and provision of real-time data and integration to corporate systems.	<ul style="list-style-type: none">• Greater access to real time information for work management.• Automated real time data exchanges between Endeavour and key emergency service providers.• Automation of highly manual, paper-based and back office data entry processes.• Stronger validation of data to drive quality of data.• Provide access to data directly in the field through mobile devices and integrate to corporate systems.• Reduce the number of embedded spread sheets used within the organisation to facilitate the transitioning workforce.• Improved work scheduling to increase output per crew through reduced travel time and down time and better job allocation.• Maintain an acceptable performance level of business applications and manage the risk around supportability.• Provide solutions that give the business flexibility to employ a range of cost effective service delivery models, e.g. in-sourced, outsourced or shared services.	<ul style="list-style-type: none">• Field Force Automation.• Asset Management Technical Currency.• Workforce Scheduling.
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Capital Investment Programs

The following section outlines the three major investment areas of the following:

- Network Asset Management ;
- Process Automation and Mobile Crews; and
- Assured Business Operations (Support and maintenance of existing systems and functionality).

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Network Asset Management

Network Asset Management focuses on meeting the strategic objectives of cost efficient and reliable supply and targets the “planning” and investment decision support processes used to meet these objectives. There are three programs of work in this investment area. Investment in technology will be targeted to facilitate the achievement of the following outcomes for the network asset management.

1. Low Voltage (LV) Control Management

Endeavour’s Energy’s distribution business is changing rapidly due to the increasing penetration of solar and other embedded generation. Endeavour provides power to over 900,000 customers of which almost 10% have embedded generation capability.

The Clean Energy Council of Australia reported that the one millionth Australian solar power system was registered in March 2013. More than 2.5 million people now live in a solar-powered home. More specifically, the solar power installed across the country by the end of 2012 is more than 20 times the amount of solar power installed at the end of 2009 and more than 75 times what had been installed just four years earlier at the end of 2008. Endeavour needs to prepare in the AER period for the change to solar power levels as well as the uptake of electric powered vehicles by consumers which will increase the demand for power by households at various times of the day and overnight. Continuing research into battery and power storage will further change the landscape of the low voltage distribution network into the future. Endeavour needs to understand more about the power generation and consumption of battery/electric powered vehicles.

The significant majority of Endeavour’s customers are connected to the low voltage network. To meet our obligations as a DNSP, Endeavour needs to be able to rely on the integrity of this network to enable the management of the increasing two-way power flow and rapidly changing low voltage distribution network landscape.

Investment in monitoring and modelling capabilities will be required over the next five years to manage the ever increasing penetration of embedded sources as well as to better manage the existing LV network. Data points from sources such as deployed smart meters, distribution substation monitors and feeder monitors will be collated to track the LV generation sizes and allow for modelling, monitoring and predicting of issues such as power quality. Investment in this technology is key to managing the continuing increase in the penetration of embedded generation without creating power quality issues or safety risks.

Similarly, the likely availability of distributed storage sources over the coming period and the increasing demand management resources presents an opportunity for balancing supply and demand and reducing the need for augmentations in the longer term. In order to realise this potential benefit a system is required to match system need with these distributed resources and control the equipment when required.

The LV Control Management System will therefore provide:

- A monitoring and analysis facility to allow Endeavour Energy to allow for the increasing connection of embedded generation without creating safety or quality issues;

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- A forecasting tool to flag areas where connection of embedded generation will start to present a problem in the future for consideration in the network connections process; and
- A tool to take advantage of and manage distributed resources (storage, demand management etc.) to flatten out peak demand to defer expenditure in the long-term.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Through selection of the "do nothing" option, current issues and risks will remain. These risks include: <ol style="list-style-type: none"> Inability to meet reliability targets due to limited ability to monitor and manage LV distribution. Inability to meet reliability targets due to limited ability to view and manage issues arising from increasing penetration of embedded generation. Increasing risks on power quality and safety from increasing embedded generation. Higher capital investments in network assets as not able to measure/manage the changes in power flows generated by consumer uptake of technologies. This option is not considered economically viable as in the event of a safety incident with embedded generation two-way power flow where Endeavour would be required to pay penalty, compensation and rectification expenses as well as investment in repairing the associated reputational damage.
Software as a Service	<ul style="list-style-type: none"> This type of solution does not exist in the market through provision of a service; however security risks in storing sensitive data in an external domain would prevent this option.
Buy / Build	<ul style="list-style-type: none"> Provide application/system based on Endeavour Energy's requirements focusing on resolving business risks and issues. Application/system will integrate with current Endeavour Energy's systems and processes.
Preferred case	<ul style="list-style-type: none"> Buy / Build an analytics solution that will integrate to existing systems within Endeavour Energy is the most effective option. Market testing will be undertaken to source an appropriate solution to ensure new functionality is obtained at the lowest possible cost.

The primary costs associated with this program of work assume the purchase of new software and hardware in addition to the use of external vendors for configuration and integration of this solution to existing asset management systems within the solution set. These costs have been derived using the following rationale:

- Software purchase costs have been estimated based on knowledge gathered by the business. Market testing will be undertaken in year 3 of the AER period to ensure efficient and prudent capital investment principles are applied.
- Hardware purchase costs have been estimated using unit costs acquired through recent market testing activities for the corporate data centre.
- Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

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- Data store/library to allow planning scenarios to be stored and re-used

It is expected that that this program of work will commence near the end of this determination period and continue into the next, as such operating expenditure increases will not be realised until next determination period.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The LV Control Management program will commence after the OT and IT integration program and systems used to monitor, collect and analyse this data will be useful in supporting the development of the LV Control Management System.

Program	Runs in Parallel with:	Supported by:	Supports
LV Control Management System		OT and IT Integration	

The investment is required to enable the business to undertake supply management under “new” conditions. Solution costs will be benchmarked against similar programs in utilities that are further along this journey than Endeavour, closer to the time of investment. As this solution will not be fully implemented within this determination period, benefits will be realised within the next determination period. Endeavour will however be able to demonstrate the scenario planning that these tools will facilitate and the impacts this data has on planning network over 10 year span.

2. Risk and Condition Based Maintenance (Reliability Centred Maintenance)

The nature of the Endeavour Energy asset base requires physical visual inspection and on-site repair. Leveraging operational technologies is expected to provide some cost efficiency opportunities for low and high voltage assets by allowing a reduction in site visits and access to real time data. A key network objective is to increasingly use operational data to support conditioned based maintenance to meet cost and sustainability targets. This drives the need for data collection and analysis mechanisms to support appraisal of assets for risk and condition, from transmission substations to distributions substations. Investment in data stores and data mining tools is needed as well as for the retention of historical data, data capture, data exception reporting and actioning to identify and correct incomplete and inaccurate data across all classes of assets and equipment.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> • The “do-nothing” option is not preferred as cost efficiency of operations will be unable to be realised within the Network business as we will miss the opportunity to understand the networks resilience through reliability targets and risk optimised asset management. This option is not considered economically justifiable as the cost of appraising assets based only on visual and manual inspections of assets will continue to increase and exceed the cost of asset appraisal and evaluation based on condition based monitoring.

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Buy new application and build new integration	<ul style="list-style-type: none"> This option is not preferred as this functionality currently exists within an Ellipse module that Endeavour Energy are licenced for under an enterprise licence agreement with the vendor. Purchase of additional software would require more extensive integration and does not represent an efficient use of capital.
Leverage investment in data stores and existing Ellipse functionality and data	<ul style="list-style-type: none"> Leverage investment made in current and proposed data stores and Ellipse maintenance planning functionality and asset data to deliver solution.
Preferred case	<ul style="list-style-type: none"> Leverage investment in data stores and existing Ellipse functionality and data is the preferred option as it requires a lower level of investment through leveraging existing functionality and less integration development requirements.

Costs associated with this program of work assume external vendors will be used for configuration of the RCBM module, updates to electronic forms and integration between Ellipse and data analytic tools. Program costs have been derived using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. No additional licences will be required as the required functionality was acquired through the purchase of an enterprise licence in 2010.

Implementation of this solution will not directly result in an increase in operational support expenditure as it is expected to be incorporated into existing ERP support arrangements; however additional maintenance costs for analytics licences will be incurred and are incorporated into the operating expenditure forecast. Third Party maintenance and operational support costs associated with support of data stores and data mining tools are expected but not directly attributable to this program of work.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Reliability Centre Maintenance program will commence after the commencement of OT and IT integration program and also run in parallel for the duration of the program. The systems developed to monitor, collect and analyse OT/IT will be useful in supporting the development of the Reliability and Condition based maintenance program.

Program	Runs in Parallel with:	Supported by:	Supports
Reliability Centre Maintenance	OT and IT Integration		

Benefits of this program will not be significant within this submission period as they will be achieved over a longer term due to the long cycles associated with equipment change over rates for larger, more critical system assets to which this program of work will be targeted. However in the longer term, industry research conducted by Gartner indicates that there are significant benefits to be achieved in the areas of cost effectiveness and asset reliability.

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3. Integrate OT and IT Asset Information

Information and Operational Technology in Networks NSW includes the use of Applications, Systems, Telecommunications, and Network Devices. Operational Technology is defined as all systems, infrastructure and devices that facilitate monitoring, control, protection and/or automation of the electrical grid and/or directly impact customer demand.

The technology and processes that IT practitioners have developed are now becoming increasingly embedded in the equipment, communications and control mechanisms used in managing the electrical network. Operating systems and sensors are being deployed, and ever-growing sets of data generated that need to be managed, secured and interpreted. The Distribution Management System (DMS) is outlined in the Operational Technology (OT) plan and describes the next five year investment in operational technology hardware and software such as SCADA, Optical fibre between Zone Substations, Distribution Feeder Automation, Distribution Substation Monitoring, Capacitor Control, Mesh Radio, Electronic Pin Board and Smart Metering.

This initiative – integrate OT and IT asset information - describes the convergence of IT and operational technology to drive the alignment and integration of data to optimise business processes, enhance information for better decisions, reduce costs, lower risks and shorten project timelines.

Investment in this program includes the integration of Smart Grid information with the Outage Management System (OMS). The benefits gained by integrating the Smart Grid information into OMS will be significant, providing real time network data to our staff allowing them to provide faster restoration times to customer affected by unplanned outages and improved utilisation of our electrical network without causing undue stress on an aging network.

Increasing the operations of the network will require access to data from SCADA systems and data from a variety of field based monitoring devices that will enable the rapid detection of faults and inputs for a risk based assessment of asset condition thereby improving responsiveness to faults and optimising asset utilisation to avoid outages or reduce outage times. To support these critical business needs, engineers will require access to accurate and up-to-date data for assets and new analytical tools to support decision making. Investment in data stores with a combination of historical and real time data will be required over the next five year period.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Do nothing is not considered a viable option as the current issues and risks will remain. These issues include: <ol style="list-style-type: none"> Limited integration and alignment between OT and IT data; Limited real time data available to network staff for operational support, analysis and planning ;and Limited asset data store and data mining capability. This option is not considered economically justifiable as Endeavour Energy will miss the opportunity to optimise business processes and decisions through improved data collection and analysis. The additional benefit of combining information and operational technology will provide data to assist in reducing project timelines and costs, improve decision making which will continue to lower operational expenditure for Endeavour Energy in the longer term.
Establish data stores and analytics for critical asset monitoring data	<ul style="list-style-type: none"> Integrate current OT/IT data stores and develop analytics on a prioritised basis, based on asset value, volumes and potential organisational risk. This program of work will provide data required for Risk and Condition Based Maintenance.
Establish data stores and analytics for all network asset monitoring	<ul style="list-style-type: none"> Integrate current OT and IT data store for provision of real time information, analysis and reporting of all network assets. This option is not selected as analysis of data for all assets will not provide the level of value required for the level of investment required to establish data capture, storage and analysis solutions.
Preferred case	<ul style="list-style-type: none"> Establish data stores and analytics for critical asset monitoring data. This presents the most prudent and efficient option for investment as it provides information needed for most critical assets where the potential for financial loss and reputational risk is higher.

Costs associated with this program of work assume that the purchase of monitoring devices will be purchased within the Network Systems capital program. IC&T will be responsible for the development of data stores and application integration.

- Licences will be required to develop and implement an IT data store to capture and manage OT data. Licence costs have been based on estimates provided by IBM for its data manager solution. These estimates will be market tested closer to the time of program commencement.
- Costs for configuration and integration have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

Additional maintenance costs for analytics licences will be incurred and are incorporated into the operating expenditure forecast. Third Party maintenance and operational support costs associated with support of data stores and data mining tools are also expected and are incorporated into an estimated uplift in operating expenditure.

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The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The OT and IT integration program will run for the five year AER period and will support the development of data systems and technology platforms that can be reused.

Program	Runs in Parallel with:	Supported by:	Supports
OT and IT Integration	<ul style="list-style-type: none"> Reliability Centre Maintenance OMS Data Mart Upgrade 		LV Control Management

Benefits of this program will not be significant within this submission period as they will be achieved over a longer term due to the long cycles associated with equipment change over rates for larger, more critical system assets to which this program of work will be targeted. This program will directly contribute to the success of the Reliability Centred Maintenance Program of work.

1. OMS Data Mart Upgrade

Investment is required to facilitate the integration of data from Ellipse and GIS with outage and reliability data in the OMS Data Mart to display network asset attribute information geospatially with outage information to promote predictive analytics and assessment of the reliability, performance and impact of asset outages.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> With this option Endeavour Energy runs the risk of maintaining the Outage Management System (OMS) Data Mart on out-of-support technology. This option is not considered economically justifiable due to the economic risks of increasing operational support costs. These costs will include vendor premium rates to support old technology and the cost of maintaining in-house skills and knowledge to support this technology.
Technical Upgrade for OMS Data Mart only	<ul style="list-style-type: none"> This is not considered an option as Endeavour will miss the opportunity to enhance and improve the functionality of the Data Mart to provide the benefits described below.
Technical Upgrade for OMS Data Mart and enhance to integrate with other data repositories	<ul style="list-style-type: none"> The enhancement of the OMS Data Mart will provide analytical capability to track the maintenance of an asset across multiple systems and application. The data mart will combine information from our ERP, geospatial systems, RequestIT and SwitchIT systems and operational IT to provide a history of assets to assist in the future planning of capital and operating investment needs.

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Preferred case

- Preferred option is to undertake a technical upgrade in year one, to ensure the supportability of the OMS Data Mart solution. In Years 4 and 5 of the AER period, a plan to combine OMS data with data from Ellipse, GIS, RequestIT and SwitchIT will support analytics programs for Reliability Centred Maintenance and IT/OT integration.

Costs for configuration and integration of Data Marts have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. These estimates have been compared to previous projects of this nature to ensure a level of reliability.

Introduction of additional Data Mart integration will attract increased support costs and these have been incorporated into a baseline uplift allowance within the operating expenditure forecasts for the AER.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The OMS Data Mart Upgrade program will commence in the second year of the AER period and will run in parallel with the OT and IT integration and Reliability Centre Maintenance programs. This will ensure technology and data systems will be optimised to support the requirements of these data intensive initiatives.

Program	Runs in Parallel with:	Supported by:	Supports
OMS Data Mart Upgrade	<ul style="list-style-type: none">• Reliability Centre Maintenance• OT and IT Integration		

Benefits of this program will not be significant within this submission period as they will be achieved over a longer term due to the long cycles associated with equipment change over rates for larger, more critical system assets to which this program of work will be targeted. This program will directly contribute to the success of the Reliability Centred Maintenance Program of work.

2. Replace Network Load History Data Stores

A number of disparate MS Access databases exist to support the capture of Network Load History information. Investment is required to replace these databases with information from Smart Grid historian to facilitate more efficient forecasting and simulations of the Network.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Do nothing is not considered a viable option as the current issues and risks will remain. These issues include: <ol style="list-style-type: none"> Critical business/network data remains in isolated, stand-alone Access databases wherein exist issues in version control, lack of data integration, limited disaster recovery and security. Escalating operating costs in supporting multiple Access databases. Limited visibility of critical data and ability to share the information across multiple platforms across the business. Ageing NLH (Network Load History) application wherein there are risks of hardware/software failure. Ageing NLH application supporting a critical business function. Limited capability in managing an increasing amount of network/business data. This option is not considered economically justifiable as the cost of maintaining multiple standalone databases with continue to increase and deliver limited functionality and value for money over time.
Replace Access Database solutions	<ul style="list-style-type: none"> Provide application/system to support data management requirement of Endeavour Energy. Current SmartGrid Historian application provides a viable economic alternative.
Preferred case	<ul style="list-style-type: none"> Replace Access Database solutions and incorporate into SmartGrid Historian Solution.

This program of work commenced in 2010/11 as a component of the Smart Grid program of work. The development of the Historian solution commenced in 2011/12 and will be productionised in 2014/15 to replace the Network Load History application. Continuation of this program of work will also see ten MS Access databases incorporated into this solution. Costs have been estimated based on the following basis:

- Quotes have been received for works to commence in 2014/15 for NLH Stage 1;
- For remaining phases to be undertaken in the remaining four years of the AER determination period, estimated costs for configuration and implementation have been derived using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. These estimates have then been compared to those of previous phases to ensure a level of reliability;
- Expansion of the Historian solution will attract increased support costs and have been incorporated into a baseline uplift allowance within the operating expenditure forecasts for the AER; and
- Benefits of this program will not be significant within this submission period as they will be achieved over a longer term due to the long cycles associated with network system asset

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replacement and maintenance and the impact that this information will have on the planning of these activities.

Process Automation and Mobile Crews

Investment in technology will be targeted to facilitate the achievement of the following outcomes for process automation and mobile crews:

1. Field Force Automation (FFA)

Mobile Technology solutions will enable the organisation to provide a more effective service in a more efficient manner. The economic justification for this investment is to, increase productivity across the organisation for field inspection and maintenance processes to allow Endeavour to limit labour cost to CPI increases. This requires increased output from field crews, to meet this target. Benefits will include reduction in travel time, increased time on value add jobs resulting increase in quality and quantity of job completed and reduction in manual data entry and error correction which will deliver FTE savings.

Investment in field force automation is critical to reduce costs of the field inspections and defect rectifications processes and drive data quality and timeliness of data updates to support management of the network. Field workers will require greater two way access to send and receive real time asset and outage information to allow timely and accurate updates for work completed in the field as well as to automate the capture of information at the point of the person doing the job and remove double handling of data entry.

Benefits of mobility will extend beyond field staff. The increasing use of outsourced contractors to deliver maintenance services requires Endeavour Energy to have flexible processes that work for both in-sourced and external workforce in the field and for back office processing of work order, invoicing and contract management. Investment in further automation of work allocation process for all maintenance types will ensure that all costs, actions and resources associated with maintenance work are recorded in the Ellipse ERP system. This supports the future asset maintenance planning cycle and links the asset with the asset performance for maintenance decision making.

Focus has also been given to reducing the cost and implementation time frame for solution through adoption of mobile platforms, away from point solutions and greater re-use of integration mechanism to key systems of GIS and Ellipse. This approach is reflected in the project cost forecasting.

Existing FFA solutions such as Field Inspection System (FIS) and Emergency Maintenance Service Orders (EMSO) will be upgraded and enhanced during the next AER period. To reduce solution costs, a standardised platform will be used to develop automated solutions using Click software are being developed for Streetlight maintenance to meet the network strategic goals of cost efficiency and safety. This technology will be leveraged to extend mobile capabilities to additional field maintenance processes in the next five years.

These investments will bring significant efficiencies in the field and cost savings will be realised, however, this still requires a substantial IT investment to deliver these benefits. Appendix G provides the Case for Change for this program of work, however a brief summary is provided below.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Endeavour's mobility investments have provided improvements in productivity, cost savings and streamlining of business processes. A recent analysis into the consumption and distribution of paper forms and manual processes completed at depot and vehicle level has identified processes that will benefit from mobile automation with the potential to realise operational cost savings and productivity improvements. Further investment is required to expand these benefits to additional field processes. The risk of doing nothing is that these manual processes will continue to increase the cost of operations and the targets to limit labour costs to CPI increases will be not be achieved and reduces the benefits associated with outsourcer labour supply, as a premium must be incurred for manual processing. This option is not considered economically justifiable as the cost of manually capturing inspection and rectification details in the field will continue to increase and exceed the cost of automated field processes.
Leverage existing investment in mobile forms, integration and devices	<ul style="list-style-type: none"> Endeavour Energy will continue to leverage off its investment in mobile technology in recent years. Mobility solutions implemented have provided productivity improvements and cost savings. Investment in mobility spans a number of processes from the automation of paper forms to mobile apps for the capture of inspection data on devices in the field, through to the integration of information from mobile devices to corporate applications. The applications, services, devices and infrastructure developed in these initiatives will be re-used and expanded to additional business processes to support Endeavour's continuing objective of delivering customer value through productivity improvements and cost savings.
Purchase COTS solution and further develop integration to key applications	<ul style="list-style-type: none"> No new Commercial Off The Shelf solutions will be considered in the coming AER period. ClickMobile was purchased during the current AER period to mobilise the field crew for Field Service Order Processing. Endeavour Energy has implemented further ClickMobile solutions using this software with integration to Endeavour's Geospatial and ERP applications. The software is currently the mobile software solution leader in Gartner's magic quadrant and advances in the software technology and functionality have been significantly developed and improved since Endeavour's initial purchase. As Endeavour has already made a significant investment in this software and own up to 100 licenses. The purchase of alternative COTS solutions is not considered a viable economic or technical option and will therefore not be considered for purchase and implementation.
Preferred case	<ul style="list-style-type: none"> Leverage existing investment in mobile forms, integration and device.

Costs for this program of work have been derived using the following assumptions:

- Purchase of user licences for software was based on cost per user from previous projects;

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- Costs for configuration and integration have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate;
- Operating expenditure impacts are expected as follows:
 - Each mobility project will undertake business process redesign in order to maximise the benefits of each investment. As a result an allowance will be made for operating expenditure on each project;
 - Through use of existing integration and web form development methods, it is not expected that there will be a significant increase in application support costs;
 - Agreements will be established for mobile device support and is planned to be in line with costs associated with laptop support; and
- Maintenance costs for additional user licences will be incurred and have been incorporated into operating expenditure forecasts.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Field Force Automation will run for the five year AER period and will support a number of initiatives across the organisation.

Program	Runs in Parallel with:	Supported by:	Supports
Field Force Automation	Mobility Infrastructure	Mobility Infrastructure	<ul style="list-style-type: none">• Fatigue Management• Improvements to Automation of Timesheets• HR Automation and workflow.

Benefits of this program of work will be realised incrementally throughout the course of the determination period and will be realised as a combination of direct and indirect cash savings. Mobilisation and automation of timesheets is expected to realise cash savings associated with the reduction of five full time equivalents within the business, this program of work will provide devices and the capability to enable these benefits to be achieved. Field capture of job and equipment data will assist in the benefits to be realised for the reliability centred maintenance program through improved data quality and job history information for use by analytic tools.

2. Workforce Scheduling

Endeavour Energy's Network Operations business manages the network construction and maintenance activities of the organisation. These activities are the core processes of the organisation and the planning and scheduling of this work is critical to achieving the strategic objective of efficiently distributing electricity to our customers in a way that is safe, reliable and sustainable. Investment in technology is required to optimise the allocation of work and scheduling of crews and to provide a workforce level view of activity, proximity and availability.

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Currently, the Regions have inconsistencies in their planning for and assessing the utilisation of their resources, including staff, in order to deliver the network plan. To improve productivity to limit real labour cost increases to CPI, it is essential to provide functionality to forward plan, and increase utilisation rates and integrate work scheduled and actual work performed with timesheet entry.

This investment will provide a tool that can support a corporate and business wide view of workforce scheduling that has the ability to review all members of the workforce for availability and suitability for jobs or tasks and therefore facilitate efficient management of resources, dependencies between resources and the ability to respond to changes particularly in the time of emergencies. The economic justification for this investment is to improve productivity. This will be evidenced by reduction in FTE rates, auditable compliance to fatigue management to support our self-insurer status and contribute to safety outcomes. Below is a brief discussion on the rationale support this investment, however refer to Appendix H – Workforce Scheduling Business Case Phase 1 for detailed costs and benefits.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Continue with disparate excel spreadsheet / Ellipse maintenance hybrid solution. This option will not meet the key requirement to provide a corporate, single view of the resources (human and equipment) available to be scheduled nor will it allow for easy resource sharing across depots and related productivity improvements. This option is not considered economically justifiable as the cost of manually planning and scheduling Endeavour's resources will continue to increase and exceed the cost of scheduling resources through a single system that is designed to optimise resources use and planning.
Implement new business solution using one of the existing scheduling tools available within the current application set.	<ul style="list-style-type: none"> Implement new business solution using one of the existing scheduling tools available within the current application set i.e. OMS, Ellipse or Click.
Purchase new work scheduling tool / purpose built solution	<ul style="list-style-type: none"> Implement new business solution using a new toolset / package identified as the most suitable for Endeavour Energy's needs. This is the fallback position if, for whatever reason, the existing products do not meet the requirements. The formal evaluation document created to assess the existing products would be reused if this path was taken.
Preferred case	<ul style="list-style-type: none"> Implement new business solution using one of the existing scheduling tools available within the current application set. This is considered the lowest risk option because of the existing knowledge base around the current products and the already established support processes, and existing support agreements that are in place for these applications. Added with the quality and market position of existing products, this presented the best option.

Costs have been calculated using the following assumptions:

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- No additional licence costs required if OMS, Ellipse or Click scheduling tool selected.
- Costs for configuration and integration have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

Through the use of an existing application, no additional support costs or maintenance will be incurred by this program of work and as such no significant uplift in operating expenditure is forecast.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Workforce scheduling program will commence in the first year of the AER period and will run in parallel with the Fatigue Management program in the subsequent years to support the standardisation of rostering and workforce scheduling to manage fatigue and the integration of these to automated timesheets.

Program	Runs in Parallel with:	Supported by:	Supports
Workforce Scheduling		Improvements to automation of timesheets	Fatigue Management

On implementation of this program of work it is expected that a reduction in the number of technical support and project support staff will be possible. At a high level, the cash benefit would be equivalent to six full time equivalents, which would be realised incrementally over the AER period. This is based on the assumption that the project will use an existing product which will minimise the amount of work involved in the data entry and export and reporting process. It will also limit the effort required in the development of work schedules and programs for staff on a day to day basis.

Assured Business Operations

The Network Plan sub processes of plan, design and construct, operate and maintain has been shaped by the Integrated Asset Management Information Strategy (IAIMS) and investment roadmap developed in the late 1990's. This strategy endorsed by the Board in 2000, set the foundation for the Distribution Management System in development today and delivered the key Network systems of Geographic Asset Information (GIS), Ellipse work asset management system and Outage Management System (OMS).

1. Asset Management Technical Currency

Ellipse provides critical data feeds to key business systems of GIS, OMS and SCADA required for the operation and maintenance of the distribution and transmission network. Technical upgrades of critical Network applications such as Ellipse, GIS and OMS and their related interfaces and data loaders will be required over the next five years to meet the strategic objectives of a sustainable network that meets customer reliability standards. The investment plan includes technical currency of critical systems such as GIS, CAD, FIS, NAAS, WMS, CAMS and several minor systems supporting business operations.

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The target environment requires technically current and highly reliable applications enhanced to drive higher levels of productivity for processing. Maintaining technically current applications also equips external service providers to deliver high quality and competitively priced services to reduce pressure on operational costs which impact network tariffs. With each technical upgrade, opportunities will be sought to drive application improvements and enhanced functionality with integration to key systems to facilitate the timely updating of changes to Endeavours' Network. It is no longer acceptable to only ensure an assured business platform during technical upgrades, but a significant change is required to improve the quality of data, method of data capture and completeness of data to support quality decision making across Network applications and systems.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Do nothing is not considered as a viable option due to increased risks to business critical applications and associated increases to operating costs as applications operate outside of technical support periods and the potential of increased remediation costs in the event of failure. This option is not considered economically justifiable due to the economic risks of increasing operational support costs. These costs will include vendor premium rates to support old technology and the cost of maintaining in-house skills and knowledge to support this technology.
Upgrade all applications within a 4-5 year technical currency program	<ul style="list-style-type: none"> Upgrade core applications within prescribed technical currency timeframes.
Upgrade all critical applications within a 4-5 year technical currency program with remainder undertaken based on risk profile / priority basis	<ul style="list-style-type: none"> Upgrade all critical applications within prescribed timeframes to ensure appropriate risk mitigation for these applications. Non-critical applications to be upgraded on a risk profile / priority basis.
Preferred case	<ul style="list-style-type: none"> Upgrade all critical applications within a 4-5 year technical currency program with remainder undertaken based on risk profile / priority basis is the preferred options as this presents the most efficient allocation of capital investment.

All application technical currency programs assume no additional licencing costs will be incurred. Market testing will be undertaken for major application upgrades to ensure efficient and prudent capital investment principles are applied to each project. Costs for application and associated integration upgrades have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. The resulting estimates have then been compared against historical upgrade projects to ensure a level of reliability.

As this program relates to technical currency, no additional uplift to operating expenditure is forecast for these projects. If enhancements are to be incorporated into an upgrade project,

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minor uplifts may be incurred and have been incorporated into a blanket forecast increase for smaller capital initiatives.

2. Outage Management System (OMS) Application Upgrade

OMS consists of PowerOn, SmallWorld, ServiceHub and Yambay's mobile solution for EMSO's. It will also hold the future Electronic Pin Board and Electronic Log Sheet functions to further enhance the control room capability. The OMS system was implemented in 2007 and is a combination of several highly customised applications. These highly customised components have been difficult to upgrade resulting in a number of applications being several versions behind in technical currency and vendors have advised that some applications will no longer be supported. Investment is required to implement the software upgrades for PowerOn, ServiceHub, SmallWorld and Web Application Server. The investment in the upgrade will include implementations of less customised applications to facilitate more frequent technical upgrades which are critical to ensuring high availability status of the OMS system.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">Do nothing is not considered as a viable option due to increased risks to a business critical application in addition to associated increases in operating costs as the applications are outside of technical support periods. Added to this, the potential of increased remediation costs in the event of failure. This option is not considered economically justifiable due to the economic risks of increasing operational support costs. These costs will include vendor premium rates to support old technology and the cost of maintaining in-house skills and knowledge to support this technology.
Undertake application upgrade within five year technical currency cycle	<ul style="list-style-type: none">Undertake a technical / application upgrade within the five year AER period.
Delay upgrade to extend capital investment requirements	<ul style="list-style-type: none">Upgrades may be delayed in the short term; however if left too long, the jump between versions may result in additional effort to be expended in bridging the gap and increased risks of implementation failure and an increase in associated remediation costs.
Preferred case	<ul style="list-style-type: none">Undertake application upgrade within five year technical currency cycle. As this application is business critical, the preferred option is to upgrade within the standard five year technical currency cycle. This will ensure mitigation of safety and reputational risks associated with outages in the network.

As an application technical currency program, it is assumed that no additional licencing costs will be incurred. Market testing will be undertaken to ensure efficient and prudent capital investment principles. Costs for application and the associated integration upgrade has been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. The resulting estimate has been compared against historical upgrade projects to ensure a level of reliability.

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As this program relates to technical currency, no additional uplift to operating expenditure is forecast for this program.

3. Project Portfolio Management System (PPMS) Upgrade

The PPMS solution comprises third party software, which is being integrated with Endeavour Energy's ERP system – Ellipse to facilitate the management and reporting of an extensive capital development program. PPMS Phase 1A was implemented in March 2013 and incorporated a subset of functionality and data to a small target audience. Phase 1B was implemented in late 2013 providing the balance of functionality and data, and was made available to in excess of 150 business users.

It is planned that within 12 months of Phase 1B Go Live, the system will be upgraded from Clarity version 12 to version 13 in order to maintain technical currency and supportability. It is also expected that a program of business priority enhancements will follow over the course of the following 3 years to introduce further process improvements and workflows.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">Do nothing is not considered as a viable option due to increased risks to a business critical application in addition to associated increases in operating costs as the applications are outside of technical support periods. Added to this, the potential of increased remediation costs in the event of failure.
Undertake application upgrade within five year technical currency cycle	<ul style="list-style-type: none">Undertake a technical / application upgrade within the five year AER period.
Delay upgrade to extend capital investment requirements	<ul style="list-style-type: none">Upgrades may be delayed in the short term, however if left too long the jump between versions may result in additional effort to be expended in bridging the gap and increased risks of implementation failure.
Preferred case	<ul style="list-style-type: none">Undertake application upgrade within five year technical currency cycle.

As this is an application technical currency program, it is assumed that no additional licencing costs will be incurred. Market testing will be undertaken to ensure efficient and prudent capital investment principles. Costs for application and the associated integration upgrade has been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. The resulting estimate has been compared against historical upgrade projects to ensure a level of reliability.

As this program relates to technical currency, no additional uplift to operating expenditure is forecast for this program.

4. DINIS Replacement

Complete replacement of the DINIS system is required over the next five years including enhancements for DINIS transmission and distribution to support the DMS implementation.

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The DINIS relational database is a customised in-sourced system that needs to be replaced to ensure ongoing support and long term sustainability of the system.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Do nothing is not considered as a viable option due to increased risks to a business critical application. This option will also attract higher support costs associated with the maintenance of a legacy system. This option is not considered economically justifiable due to the economic risks of increasing operational support costs. These costs will include vendor premium rates to support old technology and the cost of maintaining in-house skills and knowledge to support this technology.
Upgrade of infrastructure and database only	<ul style="list-style-type: none"> Upgrade infrastructure and database only to mitigate risks associated with hardware failure.
Replacement and enhancement of DINIS system	<ul style="list-style-type: none"> Upgrade DINIS infrastructure and Database and extend its use for Transmission and Distribution assets.
Preferred case	<ul style="list-style-type: none"> Replacement and enhancement of DINIS system to extend its use for Transmission and Distribution assets to provide improved information and analytics for reliability planning and protection activities.

- Cost estimates have been derived using the following assumptions:
 - As the full scope of the program and the availability of suitable applications are still not fully determined we have been unable to source indicative software licence costs from the market. For the purpose of estimation the costing of this program has been developed as if a “bespoke” system were to be built and the standard estimation model has been applied and will be subject to market testing upon development of a full set of requirements;
 - Technical upgrade costs have been estimated using the standard estimation model applying factors of duration and complexity; the results have been compared to historical projects to ensure forecast reliability; and
 - Costs to extend this solution to transmission and distribution have also been estimated using a standard estimation model applied to all projects within the submission which applies the factor of expected duration, complexity and integration needs.

Expansion of the DINIS system will attract a level of increased support costs and have been incorporated into a baseline uplift allowance within the operating expenditure forecasts for the AER.

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Benefits

To identify the success of return on investment, a benefits management plan has been established for each initiative. The table below lists the key initiatives with the indicative cost and associated benefits. The cost is in thousands of dollars (\$'000) and includes regulated and unregulated investment.

Program Title	Project Description	Total Cost	Business Benefits
Low Voltage Control Management	Up-to-date real time view of LV network and embedded generation sources, monitoring and modelling capability		Risk Mitigation <ul style="list-style-type: none"> Ability to manage two way power flows. Improve Business Capability Provide effective decision support capabilities required for a risk optimised and commercially responsible asset management approach.
Risk and Condition Based Maintenance	Incremental implementation of data collection, storage and analysis per equipment class for maintenance process		Risk Mitigation <ul style="list-style-type: none"> Reduction in fault and emergencies associated with equipment failure Optimised expenditure for network maintenance and construction costs through improved decision making capability.
Integrate OT and IT	Develop OT Data store and data mining application, integrate to IT Integrate OT data store to Ellipse and Maintenance Data Mart Data store to replace Network Load History (NLH) and stand-alone databases with Smart Grid Historian Upgrade OMS data mart and enhancements to integrate to GIS and Ellipse		Risk Mitigation <ul style="list-style-type: none"> Improve Business Capability Provide improved data quality to support effective decision making capabilities required for a risk and resource management approach underpinning the Network Supply Strategy to deliver cost effective sustainable reliability Reduced ICT Support Cost Rationalisation of technology supporting similar business processes to reduce ongoing expenditure for support and maintenance.
OMS Data Mart Upgrade	Integration of Ellipse, GIS and OMS data		Risk Mitigation <ul style="list-style-type: none"> Improve the assessment capability of the impact of outages in the network.
Replace Network Load History Data Stores	Replacement of disparate MS Access Databases		Risk Mitigation <ul style="list-style-type: none"> Provide improved network simulation and forecasting through improved data sources.

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Field Force Automation	Real-time data exchange and integration to corporate applications Common workforce scheduling application integrated with FFA Procure mobile devices and licenses for field crew		Enhance Business Capability <ul style="list-style-type: none"> • Reallocation of time from manual data entry to time on tools • through process improvement to reduce manual data entry and the printing and storage of hardcopy forms • Avoid engagement of additional labour or overtime to cope with increasing volume of work and enable increased “time on tools” for field crews.
Workforce Scheduling	Improved tools to support corporate wide workforce scheduling		Enhance Business Capability <ul style="list-style-type: none"> • Provide improved tools to support effective decision making capabilities and resource management.
Asset Management Technical Currency	Technical upgrades and enhancements of Network applications including GIS, CAMS, CAD, FIS, NAAS, WMS		Risk Mitigation <ul style="list-style-type: none"> • Provide technical currency for the current suite of operational and strategic applications.
OMS Application Upgrade	Upgrade OMS suite of applications PowerOn, Service Hub, SmallWorld and Websphere		Risk Mitigation <ul style="list-style-type: none"> • Support from the vendor with new features and enhancements.
PPMS	Enhance workflows, additional functionality and technical upgrade cycle		Enhance Business Capability <ul style="list-style-type: none"> • Provide technical currency and improved functionality to support improved processes and workflows.
DINIS Replacement	Replace DINIS hardware and application		Risk Mitigation <ul style="list-style-type: none"> • Replace in-sourced systems to ensure ongoing system sustainability.

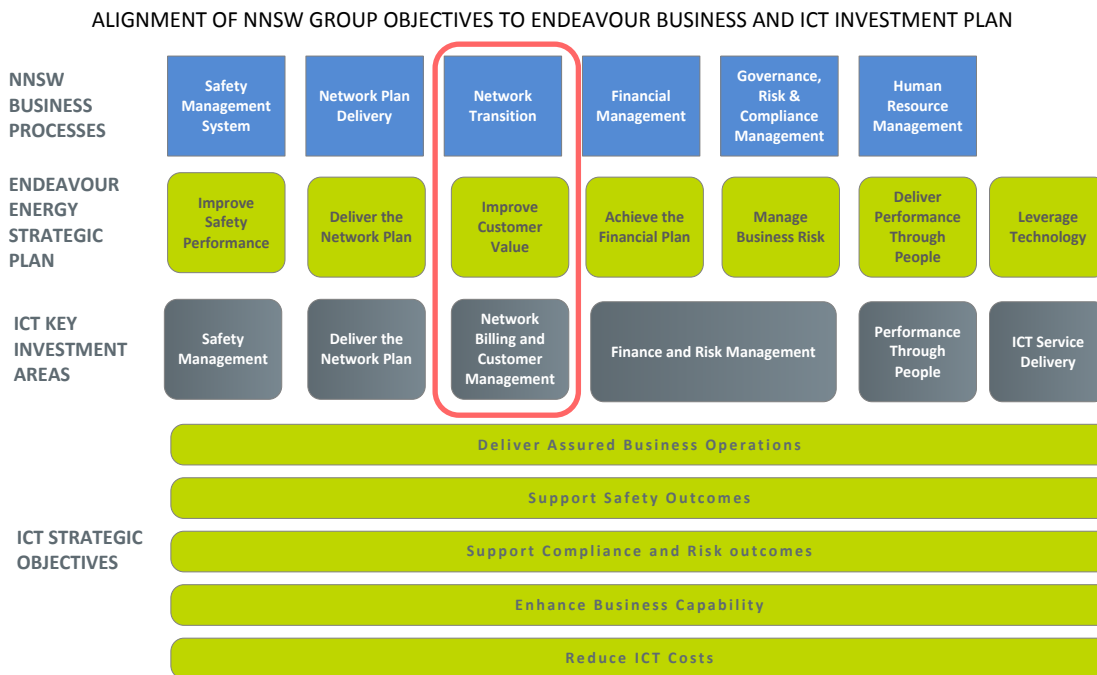
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NETWORK BILLING AND CUSTOMER MANAGEMENT

Background or Overview

Support of Network Billing and Customer Management Strategy objectives is a key investment objective of the ICT Investment Plan for the 2015-2019 AER Submission.

The following diagram shows the alignment between the Technology Plan to the Corporate Plan for **Network Billing and Customer Management**:



There are two major programs of technology investment required to deliver the Network Transition Plan. They are:

- Network Billing Assured Business Operations
- Customer Management and Compliance

Total investment of [redacted] non recurrent capital investment over the next five years is required to deliver the two major investment portfolios needed by the business to achieve business outcomes. A further [redacted] of recurrent capital expenditure will be directed to technical currency of existing systems to maintain current performance requirements cost effectively.

The following sections will outline the business context; describe capital investment plan and the justification for the level of capital expenditure.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Business Context

Network Billing

Network billing is the main revenue stream for Endeavour Energy. This process encompasses meter installation, meter maintenance, metering data collection and reporting, premise creation, customer information management, network bill calculation, invoicing and revenue collection from electricity retailers. Network billing involves a number of high data volume processes with strict deadlines for delivery. Many business activities in this process must comply with the regulations and licencing requirements of Australian Energy Market Operator (AEMO). Non-compliance or lack of data accuracy may result in financial penalties and revenue loss for Endeavour Energy.

The required business outcomes for this process are to:

- Ensure customers' electricity usage is accurately measured;
- Provide the required data for Network and Retail billing;
- Meet the regulatory requirements described in the AEMO rules and regulations (e.g. Metrology procedures, revenue collection, market reporting, customer information management, etc.)
- Collect Revenue

Key activities for this process are:

- Provision of appropriate metering equipment and associated devices to measure energy consumption and, where relevant, demand as required for billing and planning purposes;
- Management of collection, reconciliation and reporting of metering data, standing data;
- Network billing and revenue management to meet financial control obligation and commercial and regulatory responsibilities.

The business processes rely heavily on the capabilities of the IT systems to process high data volumes within strict deadlines. The current systems are stable; however, the architecture still reflects the combined retail and network business. The core systems that support the critical business processes are over a decade old and carry the inherent risks of ageing platform such as increasing maintenance costs, lack of integration with other systems and potential hardware failure.

The 2009-2014 AER submission proposed the replacement of the legacy Banner application, our billing and customer system, but due to Energy Reform this investment was delayed. The 'footprint' of Banner has diminished significantly in the last three years of the current determination with the sale of the retail business and the implementation of a "shared services" initiative that resulted in migrating Type 6 metering data processes and some of the customer connection management processes into the Ausgrid system MBS.

Legacy systems are still in place for interval meter reading data management and partially also service orders. The recently announced market testing of the metering business will impact Type 1-5 metering data management systems (nemSTAR and MV90 systems). As a result, an assumption has been made to de-scope any investment in these systems from the AER submission.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Customer Engagement

Servicing our customers by delivering a safe and sustainable reliable supply cost effectively is a key strategic objective for Endeavour Energy. Servicing our customers requires accurate customer and, connection information, and communication channels for engagement regarding connections, disconnections, outages, emergencies, and any other aspects where our activities in the provision of supply impacts customers and communities.

The required business outcomes for customer management and compliance are to:

- Maintain accurate customer and premise records;
- Deliver safe connections and disconnections of supply;
- Provide timely communications of planned and unplanned interruptions to supply;
- Comply with NECF requirements and regulations; and
- Provide customers with effective communication channels.

Key activities for this process are:

- Communicating outages and emergencies to customers;
- Actioning customer reports of unsafe and dangerous conditions and servicing inquiries; and
- Managing customer and connection information.

To ensure customers experienced a seamless transition to a Network only business, Endeavour made changes to our operating models, processes and systems to improve customer service and to comply with NECF.

Further improvements in customer data quality and customer communications are made difficult by the following issues:

- There is no single view of our customers and their service experiences;
- Managing and maintaining customer data is difficult due to the various customer touch points, systems and retailers in the provision of services to customers; and
- Our aging and process- focused IT systems makes it challenging to provide the digital contact and transactional channels that are increasingly expected by customers.

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Business Drivers for Technology Investment

A number of key factors are driving the investment in technology in this area:

- Mitigate financial and reputation risk of failure to deliver market data due to slowdown in system performance or process delays that can result in interruptions of timely data delivery to the market;
- Mitigate the risk created by the failure of legacy systems critical to business as usual operations where business continuity options are limited due to the data volumes and market deadlines;
- Increased capital costs to enhance functionality of legacy systems to meet regulatory requirements;
- High ICT support cost requires redesigning current complex architecture to a technically current, integrated solution to meet the needs of a Network only business;
- Compliance with NECF obligations by maintaining accurate data on customers and the retailers will require investment in IT systems of Endeavour Energy;
- Compliance with NECF obligations by communicating outages and restoration times, especially to vulnerable consumers on life support;
- Provide new communication channels for customers to enable customer engagement and consultation on aspects impacting customers and the community in provision of supply and outage management; and
- Comply with AEMO regulatory compliance and the resulting changes in the supporting IT systems.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Investment Context

The investment plan for technology in the Network Billing and Customer Management over the next five years supports the continuing need for stable low cost Metering & Network Billing processes and improvement in customer engagement.

Investment Roadmap

Initiatives included in the ICT Investment Roadmap for 2015-2019 have been selected on the basis that they are clearly linked to the priorities of the business; comply with NER capital guidelines, resource availability for each financial year and to provide benefits directly linked to the strategic objectives of the organisation. The cost is in thousands of dollars (\$'000) and includes total regulated and unregulated investment. (96% of this is attributable to standard control services.)

Networks NSW Category	Major Program	Program	2015	2016	2017	2018	2019
Risk	Network Billing Assured Business Operations	nemSTAR Virtualisation					
		MVRS Replacement					
		Network Billing Systems					
		Metering Systems					
		Banner Decomposition					
Mandatory	Customer Management and Compliance	NECF Compliance					
		Regulatory Compliance					
		Customer Management					
Totals							

NER Compliance

The table below shows the comparison and justification of major programs for the technology investment required to support the Network Billing and Customer Management for Endeavour.

Mapping to the relevant "Capital expenditure objective(s)" (Chapter 6, National Electricity Rules) The forecasted capital expenditure is considered necessary to achieve:		
Guidelines	Major Program	Explanation
6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services.	Network Billing Assured Business Operations	<ul style="list-style-type: none"> The proposed expenditure seeks to maintain technical currency meet operational timeframes for meter data, market service orders and network billing processes.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Customer Management and Compliance

- The proposed expenditure seeks to meet regulatory and customer expectations regarding customer interactions and provision of information for activities such as outage management.

Prioritisation

Demand Management of ICT Program resources required consultation and agreement from General Managers in the Network Business and the CFO, with endorsement from the Executive Leadership Team. The key focus was to find the balance between recurrent expenditure needed to provide an assured business platform for current systems and functionality supporting the Network Revenue and market data processes, and to ensure continued compliance. Only those projects where “do nothing “was not an option have been included in the investment program. The result of this approach is 84% on technical currency projects to deliver an assured business platform for operating the business and delivering supply. Only improve projects where positive benefits, improved risk mitigation, cost avoidance or cash savings can be realised within the 4 years have been included in the program.

Leveraging Past Investment

Due to Retail Separation and NNSW industry reform, investment in Network Billing and Customer systems was deferred awaiting government recommendations and finalisation of TSA activities. ICT investment during this period was restricted to mandatory changes and retail system decommissioning activities. As such the primary focus for the next determination period will be on technical currency programs and rationalisation of existing systems to cater for a network only organisation.

Prudent Cost Management

The key system supporting Network Billing and Customer Management is Banner, which until recently also supported Retail functions such as Billing and Credit Management. Banner was implemented in 1999 and has been extensively customised to suit the evolving requirements of the National Market and Endeavour’s business strategies moving it away from a potential upgrade path. With Banner supporting both Retail & Network functions within Endeavour a cautious approach was taken in assessing the replacement of Banner and the decision delayed until after the sale of the Retail business.

Although the decision to delay replacing Banner until after the Retail sale was a prudent one, it has increased the risk and cost associated with managing the ageing system, with upgrades onto current versions of database and infrastructure operating systems either very difficult or not achievable.

There are opportunities to leverage the power of Network NSW in this investment area and to expand the shared use of Ausgrid’s MBS metering and connection point management system. The investment options listed for this area include the migration of functions onto MBS.

For system requirements in functional areas not covered by Banner, the capital constrained environment has required Endeavour to look at capital efficient options to meet the critical needs of the business. Architectural principles will be applied to achieve the required capital

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NETWORK BILLING AND CUSTOMER MANAGEMENT

expenditure outcomes. Capital expenditure forecasts have a high reliance on re-using existing systems and their functionality to reduce the level of capital investment required to support the business in achieving operational and strategic objectives over the next five years. For example:

- Where new functionality is not available in house, off the shelf, COTS software will be sourced through market testing and
- Development of new functionality will be limited to creating new customer engagement channels that link to Endeavour’s existing systems.

Strategic Objective Alignment

Investment in technology is critical to meeting customers’ reliability needs; servicing growth in demand and managing the network safely and sustainably and to enable achievement of the overall objective of controlling increases in network tariffs to no more than the rate of increase in the Consumer Price Index. The table below links the strategic objectives from the Network Supply Strategy with the ICT investment initiatives

The following table aligns the investment initiatives and the business drivers to the strategic objectives of our technology plan:

Strategic Objectives	Business Drivers	Investment Initiative	ICT Program
Manage Business Risk	<ul style="list-style-type: none"> • Mitigate financial and reputation risk with failure to deliver data due to slowdown in system performance or process delays. • Mitigate the risk of hardware failure in systems critical to business as usual operations. 	<ul style="list-style-type: none"> • Maintain legacy systems to provide the business with an assured business platform until replacement solutions can deliver critical business outcomes. 	Network Billing Assured Business Operations.
Improve Customer Value	<ul style="list-style-type: none"> • Reduce ICT support costs to suit network only business model. 	<ul style="list-style-type: none"> • Implement new low cost solution for NUOS billing. • Continue decomposition of Banner – migrate functionality from Banner to existing systems. • Leverage of the successful implementation of MBS ‘shared services’ solutions to migrate the remaining workflow around Type 6 meters to Ausgrid’s MVRs. 	Network Billing Assured Business Operations.
Improve Customer Value	<ul style="list-style-type: none"> • Regulatory compliance - meet compliance obligation under AEMO and NECF. 	<ul style="list-style-type: none"> • Implement changes in IT systems as a result of regulatory requirements on processes/procedures. 	Customer Management Compliance Program.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Manage Business Risk, Improve Customer Value	<ul style="list-style-type: none">• Open new communication channels for customers to facilitate customer engagement and consultation.	<ul style="list-style-type: none">• Provide new customer communication channels and integrate these with the existing channels: social media/web, SMS.• Integration of customer information within Endeavour systems to ensure accurate record keeping and reduction of errors.	Customer Management Compliance Program.
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The table below lists the key business systems currently used in the network billing and customer management processes:

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NETWORK BILLING AND CUSTOMER MANAGEMENT

System	Description
Customer Management	
Revenue Plus	<ul style="list-style-type: none"> Accounts receivables and collection management.
CSS-Banner	<ul style="list-style-type: none"> Banner is a commercial application package customised for supporting customer contacts, account and billing processes, meter asset management, ASP billing and management. In addition to customer management functions, it fulfils functions in network billing and standing data creation.
Network Billing	
BTL	<ul style="list-style-type: none"> BTL performs a business transformation function for incoming and outgoing interval meter data
CSS Bill	<ul style="list-style-type: none"> In-house developed legacy application that performs network billing data aggregation and logically sits between the Banner and nemSTAR systems.
MBS	<ul style="list-style-type: none"> Metering Business System built in-house by Ausgrid. Endeavour Energy uses the system as a “shared service” for service order management and accumulative (Type 6) metering data distribution and aggregation.
MV90	<ul style="list-style-type: none"> The MV90 system is the front end system for retrieving electricity load information remotely. The system periodically performs dialup access of interval meters to retrieve interval data. The system also allows HHF format interval data to be imported from other sources such as manual read meters and out of area meters.
MVRS	<ul style="list-style-type: none"> The MVRS system provides an interface between the handheld devices used in pedestrian meter reading and the scheduling systems of cumulative non interval domestic meter reading. Daily read schedules are downloaded to MVRS for transfer to meter reader handheld devices. On completion of the daily walks, the resultant meter read data and exceptions are returned to MBS via MVRS.
nemSTAR	<ul style="list-style-type: none"> Metering data management system originally developed by Logica. Currently used for storage, substitution and reporting of Type 1-5 and Type 7 metering data, storage of non-market data (e.g. substation metering data) and contract information.
MP Database	<ul style="list-style-type: none"> Meter provider’s database. In-house developed application used to manage meter assets. It stores details on meter testing and meter decommissioning.

Capital Investment Programs

The investment plan for Network Billing and Customer Management aims to address the key challenge of the management and replacement of legacy systems in mitigating financial and reputational risks for the Network Billing processes and reduce ICT support costs. Technology will be required to automate processes to deliver improvements in customer communication, data quality and processing costs.

There are two key programs of work required to deliver business outcomes, Network Billing Assured Business operations which consists of four projects and the Customer Management and Compliance Program consisting of three projects:

Network Billing Assured Business Operations Program

Delivering Assured Business Operations is critical to provide the business with the confidence that business as usual operations can be delivered and to manage increased customer numbers and increased “churn” rates. Investment in technology and redesigning processes to minimise

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NETWORK BILLING AND CUSTOMER MANAGEMENT

manual data entry will aim to reduce the operating costs and ICT support costs. In order to deliver an assured business platform at reduced capital cost, an extension of shared services initiatives will be explored.

1. nemSTAR Virtualisation

nemSTAR is a legacy application that still supports critical business processes. Due to the recent announcement of market testing of metering business the investment in this area will only target prolonging the life of the current platform until a decision has been made on the future of the metering business of Endeavour Energy. The primary goal of the program is to mitigate the risk of hardware failure.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">Do nothing is a valid option that may still be selected, however this option presents an additional level of risk of hardware failure, which if it occurs would prevent Endeavour Energy from providing meter data to the market. This will also have an additional financial impact through inhibiting Endeavour Energy's ability to generate NUOS billing data.
Upgrade / Replace application	<ul style="list-style-type: none">An upgrade or replacement project is not preferred due to the uncertainty generated by market testing of the metering business.
Virtualise application	<ul style="list-style-type: none">Virtualisation of the application to prolong the life of the current platform until such time that a decision has been made on the future of metering.
Preferred case	<ul style="list-style-type: none">Virtualise application is the preferred option which would serve to mitigate the risks associated with hardware failure for the nemSTAR application.

The primary costs associated with this program of work assume that no new software will be required and the existing application will be virtualised on existing VM servers.

These costs have been derived using the following rationale:

- No new software will be required as the existing application will be virtualised;
- No additional hardware is required as existing Virtual Machines will be utilised; and
- Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

It is not expected that there will be any uplift in operating expenditure as this will fall under existing support arrangements with the infrastructure support vendor.

Expected benefits of this investment are primarily associated with risk of hardware failure until such time that a decision has been made on the future of the metering business of Endeavour Energy, however costs and cash impacts associated with the replacement or upgrade of the application in the near future are avoided.

2. MVRS Replacement

Endeavour's version of MVRS is end of life with a dwindling supply of parts exposed by the repeated failures of the hand held reading devices. Once a replacement is implemented Endeavour's instance of MVRS will be then archived.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">This option is not available as the hand held meter reading devices are failing at an increased rate and there is a fixed supply of replacement parts due to the devices being end of life and no longer supported. Additional stock of parts has been purchased from Essential Energy following their replacement project but on current usage this provides at best only one to two years support.
Migrate to Ausgrid MVRS or Essential Motorola	<ul style="list-style-type: none">Endeavour's intention was to leverage the investment already made by other Networks NSW distributors however concerns with the high cost of the Ausgrid option, and the reliability of the Motorola units purchased by Essential have reduced the attractiveness of these options.
New Solution	<ul style="list-style-type: none">Endeavour's preferred option is to go to market to seek a supplier for hand held meter reading devices and associated software. Any solution will need to integrate to Ausgrid's MBS system as it will continue to be the Type 6 meter data management system.
Preferred case	<ul style="list-style-type: none">Purchase / Develop new solution.

The primary costs associated with this program of work assume the purchase of new devices for meter reading, and new software to manage the transfer to data to MBS. These costs have for this program of work has been estimated using the results of market testing undertaken by Essential Energy for their MVRS system. This estimate includes the purchase of non-system specific devices which represent a more economical cost proposition as generic handsets are approximately 20% of the current device costs and are cheaper to maintain than proprietary hardware. Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs.

It is expected that there will be no increase to support and maintenance costs as this will be replacing a legacy system. Expected benefit from this investment is the ability to continue to reliably read meters and supply meter data to market participants.

3. Network Billing System

The Roadmap proposes separate solutions for NUOS Billing and ASP Billing on the premise that this allows for solutions that better match the differing requirements for each and therefore will require less modification/customisation of an 'Off The Shelf' NUOS billing solution. For ASP & Streetlight Billing, the proposed solution is to manage the invoice calculation from Ellipse, and implement a bill printing/presentation solution outside Ellipse. It is anticipated that some modifications to Ellipse and the development of an additional calculation module similar to the ESS solution will be required.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">This option is not feasible due to the age of the application and the difficulty in maintaining the technical currency of the technology stack underpinning the application.
Leverage Ausgrid's billing solution	<ul style="list-style-type: none">This option is still under consideration and is yet to be fully evaluated and costed. However there are concerns with the licencing fee and ongoing support costs of this option.
Product Implementation	<ul style="list-style-type: none">Purchase of a COTS billing solution.
Preferred case	<ul style="list-style-type: none">Implementation of a COTS billing solution.

The primary costs associated with this program of work assume only the billing engine will be replaced and not supporting or linked systems such as meter data management or NUOS dispute & payment management. The tight scope simplifies the project delivery and reduces the risks typically associated with the implementation of billing systems. These costs have been derived using the following rationale:

- Whilst the intention is to purchase a COTS NUOS billing solution, we have been unable to source indicative software licence costs from the market. For the purpose of estimation the costing of this program has been developed as if a "bespoke" system were to be built and the standard estimation model has been applied. This program will be subject to market testing;
- No additional hardware will be required for this program of work; and
- Configuration and integration costs for all projects have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

Expected benefits of this project are to provide an assured business operations for network billing and to manage the increasing support costs associated with an ageing application.

4. Metering Systems

This program of work aims to ensure the technical currency of metering systems by migrating the remaining metering management related functions to Ausgrid's MBS system. Enhancements to MBS may be required to meet functionality specific to Endeavour Energy's requirements and these will be funded by Endeavour Energy. As functions are migrated to MBS Endeavour Energy legacy systems will be decommissioned.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> This option is not feasible due to the age of the metering applications, the difficulty in maintaining the technical currency and the cost of maintaining the systems for reduced functionality requirements.
Migrate to Ausgrid MBS	<ul style="list-style-type: none"> Endeavour Energy currently uses the MBS system as a “shared service” for service order management and accumulative (Type 6) metering data distribution and aggregation. It is logical to leverage the “Power of Three” and migrate the remaining required Meter Asset Management functions to this system.
New Solution	<ul style="list-style-type: none"> A replacement project is not preferred due to the uncertainty generated by market testing of the metering business.
Preferred case	<ul style="list-style-type: none"> Migrate remaining functions to Ausgrid MBS.

These costs have been derived using the following rationale:

- Functionality will be sourced through a shared service arrangement with Ausgrid for MBS;
- No additional software will be required for this program of work;
- No additional hardware will be required for this program of work; and
- Configuration and integration costs for all projects have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

Expected benefits of this investment are primarily associated with risk of hardware failure until such time that a decision has been made on the future of the metering business of Endeavour Energy, however costs and cash impacts associated with the replacement or upgrade of the application in the near future are avoided.

An increase in operational expenditure is expected upon the transfer of additional services to the Ausgrid MBS solution; however, this will be partially offset by a reduction in support costs for legacy systems once they have been decommissioned. This has been allowed for in operational expenditure forecast growth.

5. Banner Decomposition

This program of work will aim to eliminate the need for Banner by moving required functionality and data to alternative existing systems until only NUOS Billing remains and then seek a replacement for the NUOS billing process. The shared service provided by Ausgrid, MBS will be a key target system for functionality and data. This approach eliminates the risks associated with a ‘big bang’ system implementation and recognises that a billing system may not be the ideal location for some system functionality that currently resides in Banner. Business process will be redesigned as part of this program to reduce costs and risk of manual tasks and improve data quality.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">This option is not feasible due to the age of the application and the difficulty in maintaining the technical currency of the technology stack underpinning the application.
Bespoke Development	<ul style="list-style-type: none">This option has a higher risk and cost associated with the development and ongoing support.
Product Implementation	<ul style="list-style-type: none">Lower risk with the implementation and the ongoing support costs.
Preferred case	<ul style="list-style-type: none">Product Implementation.

Cost estimates have been derived using the rationale that no additional software or hardware will be required and functionality will be sourced from applications currently within the Endeavour Energy application bundle or through a shared service arrangement with Ausgrid for MBS. As the full scope and target applications are still not fully determined and will be subject to market testing upon development of a full set of requirements, configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

An increase in operational expenditure is expected upon the transfer of additional services to the Ausgrid MBS solution. This has been allowed for in operational expenditure forecast growth. Expected benefits are as per the Network Billing system project, and include providing assured business operations, at low cost, to support business processes.

Customer Management and Compliance Program

1. NECF Compliance

Program NECF Enhancements will include the changes to the web content, new communication channels (e.g. SMS) and integration of Endeavour's outage emergency systems with a mobile web front-end suitable for viewing by smartphones and tablets to be used by field staff in the management of planned and unplanned outages.

The Networks NSW strategy for customer engagement is under review and this will influence the requirements, however at this point it is anticipated that additional integration will be required for GIS, OMS and RequestIT with mobile capabilities to enable view and update capabilities in the field to assist in location and notification of customers.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Although Endeavour is currently compliant with the NECF obligations regarding the provision of outage information, making no further improvements restricts the ability for customers to obtain information on outages from a variety of channels limiting improvements in customer outcomes. The current notification process is also very time consuming and overhead intensive.
Web Development	<ul style="list-style-type: none"> Develop a new web front-end to enable content to be viewed from a variety of mobile devices and extend the communication channels used to provide information to customers including SMS.
Web Development and improved data capture capabilities	<ul style="list-style-type: none"> Development of web capabilities in addition to improving data capture and integration capabilities to ensure compliance while improving efficiency of business processes required to support NECF compliance
Preferred case	<ul style="list-style-type: none"> Web Development and improved data capture capabilities.

The primary costs associated with this program of work assume that no additional application or hardware purchases will be required. Some modifications to GIS, OMS and Request IT applications may be required to improve customer data capture in the field and to adjust algorithms used to locate customers for outage notification.

These costs have been derived using the following rationale:

- No additional software will be required, existing backend systems, web and mobility architecture will be re-used to deliver this requirement and
- No additional hardware will be required as mobile devices will be provided through Field Force Automation program of work.

Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

Impact on operating expenditure is expected to be minimal as no new software is required and support agreements for the impacted systems are already in place. There may be a small uplift associated with additional mobile application deployment and support, which has been allowed for in the operational expenditure forecasts.

Expected benefits include continued compliance with NECF obligations and improvements in the availability of data regarding outages to reduce the impact of planned and unplanned outages on customers.

2. Regulatory Compliance Enhancements

Regulatory compliance dictates that Endeavour business processes comply with the latest prescribed processes. Given the large volume of data that the processes support, these changes often result in subsequent changes of the supporting IT systems. This program of works covers the investment in IT systems that will need to be implemented as a result of regulatory requirements be it AEMO and/or NECF related.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> This option is not available as market participants must stay current with recent versions of AEMO market systems.
Implement on schedule the regular updates to market system interfaces	<ul style="list-style-type: none"> Ensure regulatory compliance is maintained in systems, interfaces and business processes.
Preferred case	<ul style="list-style-type: none"> Implement on schedule the regular updates to market system interfaces.

The primary costs associated with this program of work assume that upgrades are required twice yearly and will not require additional hardware or software. Work will be performed by outsourced service providers that support the application. Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. This estimate has then been compared to historical spend to confirm that forecast expenditure is reasonable for the next determination period.

It is not expected that there will be an increase in operational expenditure as a result of this program of work as support agreements are in place for all affected applications. Expected benefits are limited to ensuring continued interoperability with market systems and therefore ensuring market obligations can continue to be met.

3. Customer Engagement

A key focus of Network NSW is to enhance engagement with customers. Customer research has identified one of the key themes important to customers is that of **Information**. In order to address this need, Endeavour Energy will leverage social media and deliver data to 'smart' phones and tablets to meet customer expectations for timely information that can be sourced any time anywhere and any device. The use of these communication channels will allow for wider reach of customers in emergencies (e.g. damaging storms) as well as provide Endeavour with the means to better engage our consumers.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> The increasing community demand for information will need to be met in some form, either through increased direct customer contact or via on-line means. So whilst there are other approaches to meeting this demand, a technological solution will be the most cost effective and allows customers to 'self-serve'.
Develop on-line capabilities	<ul style="list-style-type: none"> Online capabilities will increase the information provided to customers especially relating to outages: the channels to be developed include enhancing the existing web portal and adding social media.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Preferred case

- Develop on-line channels to increase the information provided to customers especially relating to outages: the channels to be developed include enhancing the existing web portal and adding social media.

The primary costs associated with this program of work assume that information from existing systems will be exposed via the Endeavour Energy Web site and / or mobile applications. No new software or hardware will be required for these initiatives. Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. Provision and collection of information via social media is expected to utilise cloud solutions currently available in the market and would be seen as operational expenditure and not included in these forecasts.

It is not expected that there would be a significant increase in operational expenditure in the form of support costs associated with these initiatives as support arrangements are currently in place for all applications and internet content.

Benefits of this investment primarily centre on risk mitigation associated with public safety through providing update to date information via the web and social media. However this initiative also develops the organisations ability to adapt and transform allowing for new communication channels.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

Benefits

To identify the success of return on investment, a benefits management plan has been established for each initiative. The table below lists the key initiatives with the indicative cost and associated benefits. The cost is in thousands of dollars (\$'000) and includes regulated and unregulated investment.

Project Title	Project Description	Total Cost	Business Benefits
nemSTAR virtualisation	nemSTAR – application will be migrated to Intel based architecture or be replaced by a new, more lightweight solution that would mitigate the risk of hardware failure.		Lower IT Support Costs <ul style="list-style-type: none"> Lower operating costs through removal of legacy hardware; Risk Mitigation <ul style="list-style-type: none"> Maintain this critical business application until the sale of metering business or until a suitable replacement (pending decision on the future of metering business of Endeavour Energy) can provide the critical business outcomes; Mitigate the risk of ageing platform (DEC AlphaServer platform).
MVRS Replacement	Migrate data and the workflow from Endeavour's MVRS into Ausgrid's MVRS. Archive Endeavour's MVRS.		Lower IT Support Costs <ul style="list-style-type: none"> Reduced cost of ownership by adoption of shared services through leveraging the 'Power of Three'. Risk Mitigation <ul style="list-style-type: none"> Single platform with lower number of exceptions. Increase in data accuracy.
Network Billing System	Migrate the NUOS and ASP billing functions from Banner to separate systems (new system for NUOS and Ellipse or Ausgrid's SAP for ASP and streetlight billing). The project includes CSS Bill process replacement.		Lower IT Support Costs <ul style="list-style-type: none"> Reduction in scale of support required for banner Risk Mitigation <ul style="list-style-type: none"> Mitigate the risk of ageing platform (Banner was implemented in 1998 and is a legacy application); Maintain the revenue stream, fulfilling our commercial and legal obligation and complying to MSAT regulations are the key required outcomes from the conservative approach to investment in this area; Business continuation.
Metering Systems	Migrate existing required metering functionality to Ausgrid MBS system (Connection Point Management, interval meters) Endeavour Energy specific enhancements to MBS Decommissioning of Endeavour Energy legacy metering systems.		Lower IT Support Costs <ul style="list-style-type: none"> Reduced cost of ownership by adoption of shared services through leveraging the 'Power of Three' Risk Mitigation <ul style="list-style-type: none"> Mitigate financial and reputation risk of failure to deliver market data.

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NETWORK BILLING AND CUSTOMER MANAGEMENT

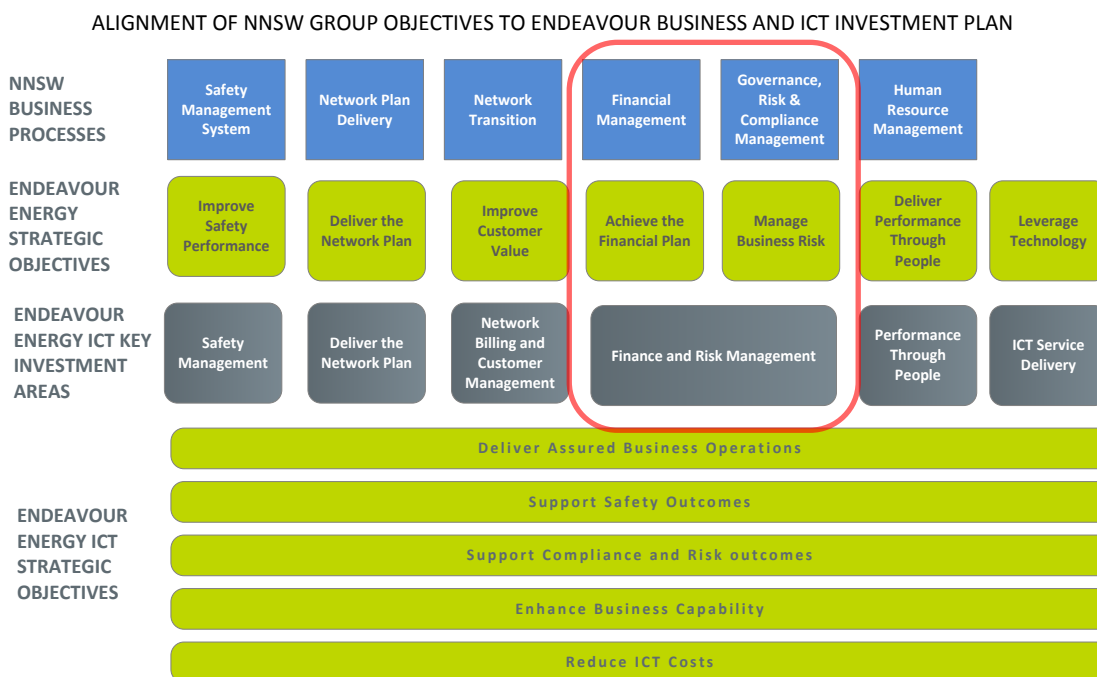
Banner Decomposition	Continue decomposition of Banner application. Migrate new and existing processes to other systems and shared services. Business process will be redesigned as part of this program to reduce costs and risk of manual tasks and improve data quality.		<p>Lower IT Support Costs</p> <ul style="list-style-type: none"> • Reduction in cost to operate the standing data maintenance process via reduction in Banner and MBS. exceptions; • Reduction in IT support costs with a reduction in the scale of Banner; <p>Risk Mitigation</p> <ul style="list-style-type: none"> • Mitigate the risk of ageing platform (Banner was implemented in 1998 and is a legacy application); • Maintain the revenue stream, fulfilling our commercial and legal obligation and complying to MSAT regulations are the key required outcomes from the conservative approach to investment in this area • Business continuation.
NECF Compliance	Analyse and develop a plan for integration of applications to provide customers with timely proactive messages on connections, disconnections, outages, emergencies etc.		<p>Risk Mitigation</p> <ul style="list-style-type: none"> • Improved public safety through up to date information; • NECF compliance through integration of systems and automation of tasks (remove error prone manual processes); • Corporate reputation, • Reduction in Type 1 NECF Breaches.
Regulatory Compliance Enhancements	Changes to application(s) and process(es) to comply with new regulatory requirements.		<p>Risk Mitigation</p> <ul style="list-style-type: none"> • Mandatory enhancements to meet Regulatory Compliance.
Customer Management	Open communication channels to enable two-way communication between consumers and Endeavour. Deliver data to 'smart' phones and tablets to meet customer expectations for timely information that can be sourced any time anywhere and any device.		<ul style="list-style-type: none"> • Adapt/transform the business and allow for new communication channels; • Improved customer satisfaction levels <p>Risk Mitigation</p> <ul style="list-style-type: none"> • Improved public safety through up to date information; • Corporate reputation.

4 FINANCE AND RISK MANAGEMENT

Background or Overview

Management of business risk is one of six Endeavour Energy's strategic objectives which are fundamental to achieving our business outcomes. Investment in technology is critical to facilitate sound commercial decisions to drive sustainability of operations and performance, to ensure risks, costs and prices are controlled and maintain a high level of compliance.

The following diagram shows the alignment between the Technology Plan to the Corporate Plan for **Finance and Risk Management**.



There are four major programs of technology investment required to support Financial and Risk Management. They are:

- Business Risk Technical Currency Program;
- Decision Support Program;
- Records Management Upgrade and Digitalisation Program; and
- Finance Automation Program.

Total investment of \$ [REDACTED] non-recurrent expenditure over the next five years is required to deliver the investment portfolios needed by the business to achieve risk management outcomes. A further [REDACTED] of recurrent capital expenditure will be incurred to ensure technical currency of existing systems to maintain current performance requirements cost effectively.

The following sections will outline the business context; describe the capital investment plan and the justification for the level of capital expenditure.

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FINANCE AND RISK MANAGEMENT

Business Context

A key objective of the Corporate Plan is to manage business risk to ensure that the organisation meets its financial, regulatory and compliance obligations. Investment in technology contributes to the organisation business risk management by designing, implementing, and supporting effective processes and systems that embed business risk management into daily operations and measure operational performance. Information management is at the core of decisions made by Endeavour Energy to meet its obligations in terms of cost control and business risk management. The business needs of corporate service areas of finance, compliance and risk are covered in this program area.

Investment in technology has supported the building of the capability for an effective response to hazardous and unforeseen events to allow Endeavour to deliver services and operations in order to safeguard the interest of its customers, key stakeholders, reputation, brand and value creating activities.

During the last determination period, Endeavour Energy has effectively leveraged technology and process re-designs to bring about improvements and cost efficiencies in the management of risk and compliance. Initiatives that have been implemented include the following:

Implementation of the Sub delegations portal which streamlined the approval processes for delegations and delivered an audit trail for sub delegations approvals and measurement of compliance.

Replaced highly manual and time consuming spread sheet processes with software solutions for reporting for Electrical Licencing, Safety and the Management Representation Letter and certification of financial information.

The core business functions and systems for this program of work are:

Finance

- Ellipse ERP System is the database of record and functionality for key financial, employee and asset data for Endeavour Energy;
- Financial Performance Management Reporting utilises TM1 the application, and with its associated SQL database resources is used to produce financial performance data for the Executives and key external stakeholders. The Cognos Suite provides the Executive with dashboards for monthly reporting; and
- Procurement Solutions including, Supplier Register, Contracts Database and Procurement Plan Register.

Compliance

- The Records Management solution is the Company's primary record keeping system that is used to manage electronic and physical records.
- Business Management System (BMS) which is the company's electronic system containing all approved policies, procedures, standards, workplace instructions and forms.
- Compliance and Audit is currently supported by the Sub-delegations register which is a bespoke application integrated with Ellipse to support compliance with the organisations

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FINANCE AND RISK MANAGEMENT

sub-delegation policy. SAI Global Compliance software – SAAS solution used to manage regulatory and safety compliance obligations. Team Mate: used to manage and analyse audit data and

- Legal Management currently utilise the Lex Matters Management application to assist in the management of legal documents and correspondence.

Decision Support and Process Performance Management

- Data warehousing and the Cognos Reporting Suite are predominately used in the areas of Network Asset Management, Human Resources Management and for Corporate and Operational Reporting. These reporting solutions are key in operational support and decision making activities within these key business areas.

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FINANCE AND RISK MANAGEMENT

Business Drivers for Technology Investment

Investment in technology for business risk management and decision support is driven by a number of new and emerging issues:

- Reduce business risk by maintaining technical currency for key systems of TM1, Records Management, Ellipse, Cognos Reporting Suite and Data warehouses;
- Mitigate the business risk of hazard events through enhancement to required systems;
- Reduce cost and complexity of compliance management increasing the ability to capture and manage vital, high risk and sensitive records through workflow and systems integration;
- Reduce corporate overhead costs of business risk management that contribute to Network Tariff increases by improving and automating finance business processes ;
- Reduce the cost of compliance and ensure compliance to new regulatory requirements and legislative demands by sourcing cost effective solutions and sharing compliance solutions across Network NSW;
- Replace manual paper-based processes by providing workflow tools and redesigned processes for efficiency purposes; and
- Provide an effective decision support platform and data stores with high level of integrity and a range of reporting capabilities. These are required for the risk optimised and commercially responsible asset and resourcing management approach underpinning the Network Supply Strategy to deliver cost effective sustainable reliability.

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FINANCE AND RISK MANAGEMENT

Investment Context

Endeavour seeks to demonstrate effective business risk management by ensuring that risks are understood, promoted, effectively managed and reported. Endeavour Energy has been refining and strengthening its approach to business risk management for a number of years and in the next five years will leverage investment in key systems to drive continuous improvement to the processes used to manage and report business risk management. The areas where investment will be targeted are assured business operations, process automation and decision support.

As a result of consultation and prioritisation in a capital constrained environment, four major investment programs are required to support delivery of the Finance and Risk Management Plan:

- Business Risk Technical Currency Program;
- Records Management Upgrade and Digitalisation;
- Decision Support Program; and
- Finance Automation Program.

Within each major program are a number of programs of work which focus on business sub processes and their related technology to deliver business outcomes. These programs of work have been classified using the Network NSW capital investment criteria.

Investment Roadmap

Initiatives included in the ICT Investment Roadmap for 2015-2019 have been selected on the basis that they are clearly linked to the priorities of the business; comply with NER capital guidelines, resource availability for each financial year and to provide benefits directly linked to the strategic objectives of the organisation. The cost is in thousands of dollars (\$'000) and includes total regulated and unregulated investment. (96% of this is attributable to standard control services.)

Network NSW Category	Major Program	Program	2015	2016	2017	2018	2019
Risk	Business Risk Technical Currency	Upgrades of Lex, BMS, Team mate, Supply chain, Ellipse, Treasury Management and Financial modelling and budgeting applications.					
Risk	Records Management Upgrade and Digitalisation	eDocs application upgrade.					
Risk	Decision Support Upgrade	Decision support application upgrade.					
Improve	Finance Automation	Supply chain process improvements, Kofax integration, finance automation process.					
Totals							

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FINANCE AND RISK MANAGEMENT

NER Compliance

Investment in Finance systems over the next five years is required to facilitate sound commercial decision making and drive sustainable operations and control business, financial and safety risks and maintain compliance across the business. The table below shows the justification of major programs for technology investment required to support Endeavour Energy’s technical environment.

Mapping to the relevant “Capital expenditure objective(s)” (Chapter 6, National Electricity Rules) The forecasted capital expenditure is considered necessary to achieve:		
Guidelines	Major Program	Explanation
<p>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</p> <p>(i) the quality, reliability or security of supply of standard control services [prescribed transmission services]; or</p> <p>(ii) the reliability or security of the distribution system through the supply of standard control services [prescribed transmission services], to the relevant extent:</p> <p>(iii) maintain the quality, reliability and security of supply of standard control services [prescribed transmission services] and</p> <p>(iv) maintain the reliability and security of the distribution [transmission] system through the supply of standard control services.</p>	<ul style="list-style-type: none"> Business Risk Technical Currency Program Records Management Upgrade and Digitalisation Program Finance Automation Program 	<ul style="list-style-type: none"> The proposed expenditure for the Financial and Risk Management process seeks to deliver customer reliability through improved data quality, management and analytics of assets and services to improve productivity and reliability through improved decision making and data quality.
<p>6.5.7(a)(4) maintain the safety of the distribution system through the supply of standard control services.</p>	<ul style="list-style-type: none"> Decision Support Program 	<ul style="list-style-type: none"> The proposed expenditure for the Finance and Risk Management process seeks to drive safety of supply and customer safety by utilising the appropriate data stores, reporting and analytics frameworks.

Prioritisation

Management of demand for ICT funding required consultation and agreement from the General Manager Finance and Compliance and General Manager People and Services with endorsement from the Executive Leadership Team. The key focus was to find the balance between recurrent expenditure needed to maintain a high level of performance for current systems and functionality, and to equip the business with new functionality needed to achieve strategic outcomes in a constrained expenditure environment. Only those projects where ‘do nothing’ was not an option

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FINANCE AND RISK MANAGEMENT

have been included in the investment program. The result of this approach is 59% on technical currency projects to deliver an assured business platform for operating the business and delivering supply. Only “improve” projects where positive benefits, improved risk mitigation, cost avoidance or cash savings can be realised within the 4 years of this review period have been included in the program.

Leveraging Past Investment

Endeavour has continued to invest in technical upgrades for Ellipse and the Cognos reporting tool to mitigate risk to business operations and to leverage functionality enhancements delivered with major software releases. This investment approach has allowed Endeavour Energy to continue to develop and enhance these systems to achieve business productivity, improved data quality and reliability as well as improved compliance capabilities in a capital efficient manner.

Continued development of business and technical architecture has enabled Endeavour Energy to plan the development of solutions such as a mobile timesheet that will capture time worked on a job at a single point of entry, that can in turn serve multiple functional and information needs across multiple strategic focus areas i.e. asset maintenance history; real time overtime tracking to assist in safety initiatives for fatigue and the capture of financial transactions for financial and management reporting.

Prudent Cost Management

The capital constrained environment has required Endeavour to look at capital efficient options to meet the critical needs of the business. The architectural principles that will be applied to achieve the required capital expenditure outcomes are as follows:

- Capital expenditure forecasts have a high reliance on re-using existing systems and their functionality to reduce the level of capital investment required to support the business in achieving operational and strategic objectives over the next five years.;
- Where new functionality is not available in house, for example for Supplier and Contractor lifecycle solution, COTS software or Software as a Service solution (SAAS) will be sourced through market testing to provide cost effective solutions; and
- Development of new functionality will be limited where possible to web frontends to support mobility and process automation using common architectural frameworks to contain capital development and project costs.

To reduce operating expenditure and improve technology service delivery to business leaders and users, during the next five years, ICT will secure best quality/best cost application and business support services through market testing as well as exploiting “the power of three”. In the last year of the current AER period new outsource contracts were executed to secure specialist application vendors for Enterprise Resource Planning support services.

Strategic Objective Alignment

Investment in technology will be targeted to support the following strategic focus areas for Finance and Risk Management:

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FINANCE AND RISK MANAGEMENT

- Risk Management Process;
- Financial Governance;
- Capital and Operating Cost Control; and
- Financial Risk Management.

The table below aligns the investment to the strategic objectives for risk, finance and compliance.

Strategic Objectives	Business Drivers	Investment Initiative	ICT Program
Financial Governance	Manage Business Risk	<ul style="list-style-type: none"> • Upgrade Ellipse, (ERP) and TM1 to provide technical currency for core systems with organisational wide impacts on business risk management and process operations • Sourcing solutions offering "content currency" to specific regulatory and legislator risk areas. 	<ul style="list-style-type: none"> • Business Risk Technical Currency Program •
Financial Risk Management	Decision support	<ul style="list-style-type: none"> • Upgrade data stores and reports required for operations and decision support to supported Cognos version • Deliver data stores with high level of integrity and a range reporting capabilities. • Enhancing analytics capabilities to contribute towards greater value driven business decision making, scenario analysis, stress testing and contingency planning. 	<ul style="list-style-type: none"> • Decision Support Cognos Upgrade Program.
Risk Management Process	Manage business risk and improve operations	<ul style="list-style-type: none"> • Reduce complexity and increase the ability to measure and monitor the management of high risk, vital or sensitive business records • Provide tools and support processes for the transition towards greater digital information management. 	<ul style="list-style-type: none"> • Records Management Upgrade and Digitalisation Program • Business Risk Technical Currency Program.
Capital and Operating Cost Control	Efficient Operations	<ul style="list-style-type: none"> • Redesign contract and supplier management processes and leverage technology to reduce multiple manual data entry, improve data quality to improve the ability to meet our obligations for the safety of vendors and suppliers. • Redesign Accounts Payable processes to reduce cost of processing per invoice to industry best practice. • Deliver Exception Reporting to assist with monitoring and measurements of risk to drive better risk management outcomes more cost effectively. 	<ul style="list-style-type: none"> • Finance Automation Program • Business Risk Technical Currency Program.

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Capital Investment Programs

Business Risk Technical Currency

The core systems that have organisational wide impacts on business risk management and process operations are: Ellipse, the organisation Enterprise Resources Program (ERP) and the TM1 financial reporting tool. These core systems were upgraded in the current AER period and will be upgraded within the next five years in order to maintain a level of technical currency and supportability.

- Ellipse technical upgrades to the current version will be undertaken in line with vendor recommendations to maintain support contracts. A planning study will be undertaken towards end of the next AER period with the view to facilitate the next upgrade to version 8 or higher. This will also offer additional functionality for mobility and the data convergence of OT/IT;
- TM1 technical upgrades to the current version will be undertaken in line with vendor recommendations to maintain support contracts as this functionality is critical to mitigate business risk and the business is experiencing some performance issues with current version;
- Endeavour Energy's current Business Management System (BMS) is due for replacement in the 13/14 financial year. An assumption has been made that a technical upgrade of the product will be required towards of the end of the AER period; and
- Endeavour has a number of special software solutions for compliance, risk assessment, audit and legal that are used to track, measure and benchmark compliance and business risk management. On licence renewal or application upgrades, the cost and benefits of the current solution is reviewed with the business owner to determine to upgrade or replace to deliver the best value option for Endeavour.

In all cases, investment in product upgrades is not guaranteed purely based on maintaining currency of versions in line with vendor recommendations. The 'Do Nothing' option is explored and forms a base case including identifying any risks and issues associated with this option.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">• Do nothing option is not considered due to increased risks to business critical applications and associated increases to operating costs as applications operate outside of technical support periods and increased remediation costs.
Upgrade/enhance existing systems	<ul style="list-style-type: none">• Upgrading of core applications within prescribed technical currency timeframes.
Preferred case	<ul style="list-style-type: none">• Upgrade/enhance existing systems is the preferred option to mitigate risks and increases to operational support costs associated with non-compliance to technical currency programs. Where feasible, enhancements will be bundled with upgrade projects to minimise capital investment requirements and to minimise impact and disruption to end users and business as usual.

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The primary costs associated with this program of work assume that in the areas where there has already been significant investment in technology the option of enhancing existing systems (Ellipse ERP, BMS) will be the preferred approach. Where existing systems do not meet the current needs of the business the buy/build option of sourcing a replacement system (TM1) has been incorporated into the costing assumptions. An assumption has been made for the purposes of costing that the smaller special software solutions will be upgraded to maintain currency and take advantage of new functionality offerings.

These costs have been derived using the following rationale:

- Software costs for a replacement of the current TM1 financial modelling system have been based on current market rates for similar software. For all other solutions under this program of work an assumption has been made that as existing systems will be upgraded, no additional software costs will be required and that the costs incurred will be related to standard project tasks;
- There is no additional hardware costs associated with this program of work. Hardware costs are incorporated in to the IT Infrastructure program of work; and
- Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

The software costs of upgrades are factored in to the existing licencing and support agreements. Therefore the upgrades are expected to have little effect on the operating expenses associated with these solutions.

The expected benefits of risk reduction by maintaining supportability with product vendors and cost reduction by reducing the time taken to complete compliance and risk health checks through automation will commence in the 2016/17 financial year but will not be fully realised until after the AER period as the greatest benefits will be achieved through the Ellipse upgrade which is expected to be completed in 2018/19.

Record Management Upgrade and Digitalisation Program

By the commencement of this AER period, eDocs will have been replaced with Content Server, which in turn will require a major upgrade during the next five years to mitigate technical and business risk. The continued investments in information management initiatives will aim to reduce the potential for financial losses associated with the management of vital, high risk and sensitive records and provide immediate access to information for legal, regulatory, and compliance issues. This program of work will deliver tools and redesign processes to transition Endeavour Energy towards greater digital information management to replace manual paper-based processes and reduce stockpiles of paper records stored in archives. The business outcomes are reduced cost and increased compliance for records management as well as business improvement and productivity gains. The progressive roll out of enhanced information management practices, such as the increased use of workflow tools to replace manual processes, shall be undertaken on a process by process basis, where savings and efficiency opportunities present themselves.

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The costs in this program area, beyond the costs of any required technical currency programs, will be in the form of software configuration to be able to realise the benefits of workflow and business process re-engineering that will realise the intended efficiency gains. In any case, the 'Do Nothing' option remains available to the business. The opportunity and tools for improvement will have been made available through the process of delivering IT technical currency programs; however the rate of adoption shall be tempered by business appetite and capacity for change.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> The OpenText eDocs Records Management system is a technology platform designed over ten years ago specifically for physical and electronic records management. The functionality of OpenText eDocs was focused on providing functionality for managing records in their state by scanning paper document or tracking paper originals. The business requirements for records management had expanded significantly from this original records management purpose to being able to managing information through its complete digital lifecycle. The business needed to be able to process information in any format (such AutoCAD) through the initial drafting, business review and approval in a fully digital process, with the audit and security controls maintained at each phase of the information lifecycle. The analysis of the current OpenText eDocs system identified that its ability to provide these digital process would require significant redesign, customisation, scripts to maintain security and additional 3rd party modules to achieve the required business process. This analysis identified that this approach would require a higher financial investment than moving in the newer generation Technology of OpenText Content Server.
Enhance existing systems	<ul style="list-style-type: none"> The enhancement of the OpenText eDocs RM system to the OpenText Content Server delivered a superior Records Management function that was transparent to the business user, and also delivered a browser base folder structure, inbuilt workflow functions, forms creation & processing, and search capabilities for a lower total cost of ownership.
Preferred case	<ul style="list-style-type: none"> Enhance existing systems.

The primary costs associated with this program of work assume that the costs in this program area, beyond the costs of any required technical currency programs, will be in the form of software configuration to be able to realise the benefits of workflow and business process re-engineering that will realise the intended efficiency gains. In any case, the 'Do Nothing' option remains available to the business. The opportunity and tools for improvement will have been made available through the process of delivering IT technical currency programs; however the rate of adoption shall be tempered by business appetite and capacity for change. These costs have been derived using the following rationale:

- There is no additional software licence cost associated with this program of work as the new Content Server solution will have only just been implemented prior to this AER period;
- There is no additional hardware cost associated with this program of work as the hardware supporting the solution is already in place; and
- The costs incurred for this program of work will primarily be as a result of integration, configuration and standard project tasks. Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

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The digitalisation of records management will occur progressively throughout the AER period. The impact on operational expenses is expected to be minimal as there is no new software involved and the support agreement for the Content Server solution is already in place. There may be a small uplift in baseline support as more and more interfaces between systems are implemented for single source document retrieval.

The expected benefits of improved security, audit compliance and reduction in time and cost associated with the storing and retrieval of digital records are expected to commence and continue as each integration point is achieved. The benefits will commence from the 2015/16 financial year and continue throughout the AER period.

Decision Support Cognos Upgrade Program

Investment in data warehousing and BI in the current AER provided a robust framework for network assets, maintenance, work orders and employee data that is stored, accessed and analysed, to support decision making in day to day operations, historical and trending reporting for tactical and strategic initiatives. These assets will need to maintain technical currency and support within the next five years from current Cognos 8 version to 10 and beyond in order to continue to support BAU operational activities across the business. The timing of the technical currency driven updates will be selected based on the risk assessment of 'Do Nothing', and will be aligned with new business requirements and added value that can be realised as a result of undertaking the upgrades.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> • The "do nothing" option is not the preferred option for the following reasons: <ol style="list-style-type: none"> 1. expose the organisation to owning Corporately endorsed and utilised software that would be unsupported by the application vendor 2. risk the maintenance and viability of existing Corporate data warehouse (██████ investment) 3. risk key processes and analysis capability that rely explicitly on the Corporate data warehouse, e.g. the Executive Leadership Team (ELT) reports on Earnings, Deductions and Overtime, an initiative that has identified the approximately ██████ in savings for Endeavour 4. risk the foundational data repositories that are required for the future-state of Endeavour Strategic Analytics to expose more targeted savings initiatives 5. retract the capability to view Company information through more than one application/process lens, see examples below - <ul style="list-style-type: none"> • the data warehouse currently permits the accumulation, matching and processing of data from disparate data sources e.g. Asset information from Ellipse is matched to GIS information to discover 'Energised State' mismatches between the systems for data remediation • the data warehouse currently permits a wide concurrent analysis of assets, work order, human resources, projects, outage system information, safety and financials.

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Enhance existing systems	<ul style="list-style-type: none"> Through maintaining technical currency and undertaking enhancement activities for the existing toolset, Endeavour Energy is enabled to continue with business as usual activities as well as to continue with data analytics required to further optimise asset maintenance activities, identification of further cost savings initiatives as well as support strategic initiatives including the Integration of IT and OT and RCBM.
Preferred case	<ul style="list-style-type: none"> Enhance existing systems.

The challenge for the next five years is to extend on the existing solution foundations by effectively managing existing data, and new data generated by extended use of operating technologies. In order to extract value from the data and information assets, a focussed investment in analytics methodologies and appropriate tools is required. This will enhance the ability to identify efficiency, productivity and cost savings opportunities, as well as supporting effective capital investment decisions. Doing Nothing in the area of advanced analytics will significantly impede the ability of the business to identify real cost savings, efficiencies and productivity opportunities.

The primary costs associated with this program of work assume the costs associated with the increased adoption of analytics methodologies will be in the project management tasks and consulting services to configure and use the tools to assist the business in decision support. These costs have been derived using the following rationale:

- There is no additional software licence cost associated with this program of work as the Cognos BI solutions are already in place;
- There is no additional hardware cost associated with this program of work as the hardware supporting the solution is already in place; and
- Project, Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

The impact on operational expenses is expected to be minimal as there is no new software involved and the support agreement for the Cognos BI solution is already in place. However, there may be a small uplift in operating expenses as more reports and, more importantly, ETLs are developed and implemented. Increases are expected to commence from 2015/16 and increase each year as new solutions are implemented.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Decision Support Upgrade program will commence in the first year of the AER period and will run in parallel with the OT and IT integration program. This will ensure decision support technology and data systems will be optimised to support the requirements of these data intensive initiatives.

Program	Runs in Parallel with:	Supported by:	Supports
Decision Support Upgrade	OT and IT Integration		Reliability Centre Maintenance

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The expected benefits of effective decision support, improved monitoring and measurement of the effectiveness of internal controls and the maintenance of technical currency are expected to commence and continue as each new data warehouse/reporting solution is achieved. Use of existing data warehouses and reports has contributed to efficiency savings in the pole maintenance completion process. Extension of these solutions will contribute to future productivity savings which will assist in capping real labour increases to CPI. These benefits are expected to commence from the 2015/16 financial year and continue throughout the AER period. The technical upgrade of the Cognos suite is expected to be implemented in 2017/18 and will result in significant benefits in reporting capability in the last year of the AER period.

Finance Automation Program

Planned initiatives leveraging existing technologies for the next five years include the process redesign and automation of:

- Contract and supplier management processes to reduce multiple manual data entry of the same information in Ellipse, the Supplier Register and many excel spread sheets and word documents. Investment in technology will commence in the 2013/14 year with implementation of the first phase expected in 2014/15. Further investment will be undertaken to create an integrated one stop self-service portal for all supplier prequalification, certification and on-boarding steps plus sourcing, contract management and e-procurement activities. Key benefits of the new solution will be reducing costs, improving data quality and providing the ability to monitor and measure business and compliance risk of the procurement process including our obligations for the safety of vendors and suppliers;
- Finance processes including the Financial Reconciliation and Journal Entry processes and the Accounts Payable process to reduce cost of processing per invoice to industry best practice; and
- Exception reporting to assist with monitoring and measurements of risk will be explored to drive better risk management outcomes and at a lower cost using existing technologies.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">• Do nothing is a valid option, however many of the finance and procurement processes are highly manual and inefficient. Selection of this option will significantly impede the ability of the business to achieve real cost savings, efficiencies and productivity opportunities.
Software as a Service	<ul style="list-style-type: none">• Purchase of hosted / cloud services for Supplier and Contract Management and financial reconciliations.
Bespoke Build	<ul style="list-style-type: none">• This option is not viable due to high development, implementation and support costs when compared to purchase of cloud services that are readily available within the market.
Preferred case	<ul style="list-style-type: none">• Software as a Service has been selected as these services are commonly available within the market and can be readily configured to meet the needs of the organisation. Capital investment will be limited to design and configuration.

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As the investment in solutions for Supplier and Contract Management and Finance Automation began in 2013/14, there is significant opportunity to leverage the available modules and capabilities of the new tools over the next five years to extend to other processes in the Procurement, Logistics and Finance functions. This will enhance the ability to identify efficiency, productivity and cost savings opportunities, as well as supporting effective capital investment decisions. Whilst the business reserves the right to 'Do Nothing', selecting this option will significantly impede the ability of the business to achieve real cost savings, efficiencies and productivity opportunities.

The primary costs associated with this program of work assume that the significant investment in licencing and implementing the solutions has taken place in the 2013/14 financial year. These costs have been derived using the following rationale:

- An allowance for additional software and licencing costs of the supplier management and e-procurement solution in the 2014/15 financial year has been allowed for. Whilst the solution is expected to be a SaaS solution, this figure has been determined based on market testing and the initial responses received from an RFI process carried out at the end of the 2012/13 financial year;
- No hardware costs have been included in this program of work as the solutions will either be SaaS implementations or will be "virtualised" on the existing infrastructure platforms; and
- Project management, implementation, configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

The Supplier, Procurement and Finance Management systems are expected to be implemented as Software as a Service solutions and the operational impact of the service subscription will come into effect in the 2014/15 financial year. Any further impact on operational expenses after the 2014/15 financial year is expected to be minimal and will relate to increases in service subscription fees due to the increase in the user base of the systems and the development and support of new interfaces.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Finance Automation program will commence in the first year of the AER period and will run in parallel with the HR Automation program. This will ensure technology and architecture can be developed to support the automation of both processes and systems will be optimised to support the requirements of these automated processes.

Program	Runs in Parallel with:	Supported by:	Supports
Finance Automation	HR Automation	<ul style="list-style-type: none">• Field Force Automation• HR Automation	

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The expected benefits of cost reduction due to the automation of highly manual processes, increased data integrity and effective decision making due to the single source of truth and integration of data will commence on implementation of the base solutions in 2014/15 and will continue each year as the solutions are expanded to further process areas and more financial processes are automated and integrated.

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Benefits

To identify the success of return on investment, a benefits management plan has been established for each initiative. The table below lists the key initiatives with the indicative cost and associated benefits. The cost is in thousands of dollars (\$'000) and includes regulated and unregulated investment.

Program Title	Program Description	Total Cost	Business Benefits
Business Risk Technical Currency Program	<ul style="list-style-type: none"> • Ellipse Technical Upgrade • TM1 Finance Reporting Tool • Treasury Management Software • Sub-Delegations Upgrade • SAI Global Compliance software modules • Team Mate. • Legal Matters 		<p>Risk Mitigation</p> <ul style="list-style-type: none"> • Maintain BAU at required performance level and maintain supportability with product vendors. <p>Enhance business capability</p> <ul style="list-style-type: none"> • Reduce costs and time taken to complete compliance and risk health checks through automation.
Records Management Upgrade and Digitalisation Program	<ul style="list-style-type: none"> • Enhance and maintain Content Server • Integrate vital records from DBYD to Content Server 		<p>Risk Mitigation</p> <ul style="list-style-type: none"> • Maintain BAU at required performance level through software upgrade or replace with option offers enhanced functionality • Reduce number of audit breaches and items related to security. • Improve security compliance by providing multiple security levels in a controlled document management system. • Reduce search time for information required to resolve and report for legal, regulatory, and compliance issues • Reduce cost, complexity and risk of vital record management by improved workflow. Increase the ability to measure and monitor high risk, vital or sensitive business processes through workflow and systems integration. Baseline to be established to allow benefits to be measured • Increase % of digital recordkeeping in Endeavour • Monitor and measure business and compliance risk of the procurement process.

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<p>Decision Support Program</p>	<ul style="list-style-type: none"> • Maintain and enhance Data warehouses and BI Suite for • Network Asset Management • Human Resources Management • Cognos Reporting Catalog for Corporate and Operational Reporting • Strategic Analytics 		<p>Enhance Business Capability</p> <ul style="list-style-type: none"> • Maintain technical currency for current suite of operational and strategic tools • Provide effective decision support platform required for the risk optimised and commercially responsible asset and resourcing management approach underpinning the Network Supply Strategy to deliver cost effective sustainable reliability. <p>Risk Mitigation</p> <ul style="list-style-type: none"> • Deliver better risk management outcomes and lower cost using existing technologies • Deliver means to monitor and measure effectiveness of internal controls to improve business risk management.
<p>Finance Automation Program</p>	<ul style="list-style-type: none"> • Redesign and automate process for • Contract and Supplier Lifecycle • Accounts payable • Bank reconciliation 		<ul style="list-style-type: none"> • Reduce costs of manual data entry, rework due to lost paperwork and time lost following up on delays in the process. FTE savings expected in back office areas of procurement • Avoid increase costs of labour required to comply with Suppliers OHS requirements. • Reduce cost of processing per invoice to industry best practice standards procurement. FTEs savings will be achieved through this project • Reducing costs of highly manual process. FTE savings will be an expected outcome of this project.

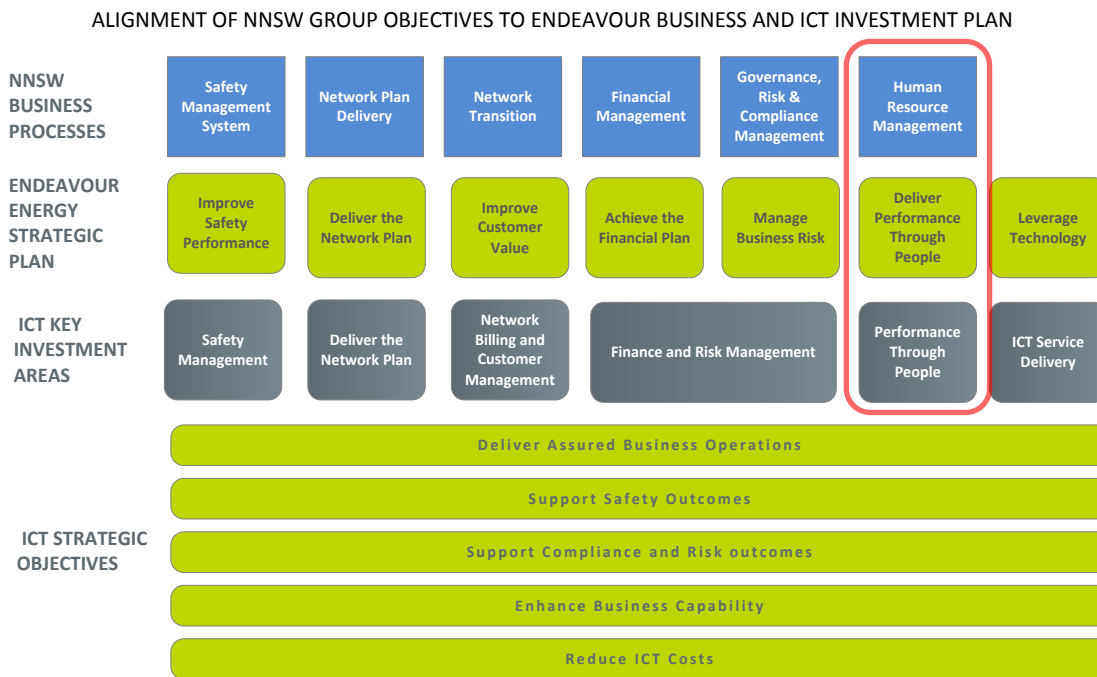
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PERFORMANCE THROUGH PEOPLE

Background or Overview

Support of HR Strategic objectives contained within the HR Strategic Plan is a critical element of the ICT Investment Plan for the 2015-2019 AER Submission.

The following diagram shows the alignment between the Technology Plan to the Corporate Plan for **Performance through People**:



There are four Major Programs of technology investment required to deliver Performance through People. These are:

- Employee Portal Improvement;
- Learning Management System (LMS) Process Enhancements;
- HR Workflow, Automation and Collaboration; and
- Timesheet automation.

Total investment of ██████████ non-recurrent expenditure over the next five years is required to deliver the investment portfolios needed by the business to achieve safety outcomes. A further ██████████ of recurrent capital expenditure will be incurred to ensure technical currency of existing systems to maintain current performance requirements cost effectively.

The following sections will outline the business context; describe the capital investment plan and the justification for the level of capital expenditure.

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Business Context

The Human Resources (HR) strategy aims to build an engaged and capable workforce that enables the achievement of business outcomes. Endeavour Energy's corporate and administrative functions face the challenges of demonstrating contribution to the network tariff control through efficiencies and cost reductions as well as creating the environment which builds the capability and culture to allow the organisation to achieve its strategic objectives.

Technology has a significant role to play in automating manual processes, integrating data and systems for process performance improvement and enhancing performance reporting. The challenge in the 2015-2019 AER period for both Endeavour Energy as a whole and IT in particular is to equip employees with the competencies, in addition to the tools, to do their jobs and to make the technologies they use more intuitive, user friendly and accessible and to provide self-serve capability.

Employee's must be engaged and equipped to effectively leverage technology and access the information they need to do their job now and to meet the demands for improved outcomes over the next five years.

Employees, both in the field and in the office, expect that the technology provided in their workplace will be no less capable than that which they use at home and they want to use their IT literacy to self-serve to complete processes and to access information and services. Investment in technologies in the 2015-2019 AER period will be focused on ensuring that the tools people use at work are as simple and easy to use as the technology they use outside of the working environment.

The core systems currently used to support the HR goals are:

- Ellipse for employee related information including payroll, leave, personal details, training records and time and attendance;
- Extranet/Intranet for communication and training;
- NGA.net for e-recruitment;
- Cognos for reporting and performance measurement;
- Mobile devices and network connectivity to deliver "Office in a truck"; and
- Business Management system for policies and procedures.

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Business Drivers for Technology Investment

A critical objective of the Human Resources strategic plan is “to build an engaged and capable workforce that enables the achievement of all business outcomes” in a cost effective manner. The key business drivers for delivering performance through people are to engage our people, communicate our change in culture and build our capabilities to deliver performance through a productive workforce.

Investment in technology will continue to be instrumental in assisting the organisation in facing the challenges of Delivering Performance through People. The challenges of identifying further productivity improvements and cost reductions to offset real wage increases, as well as creating the environment which builds the capability and culture of the organisation is driving investment in technology and process redesign to:

- Build core leadership competency and align leadership capability to our desired culture by providing electronic and remote access to information for field staff, project managers and managers, providing better record keeping of the provision of training to maintain professional qualification and for the continuous development of staff;
- Build understanding of purpose, values and business objectives by delivering cost effective and easily accessible online training and competency assessment programs in key cultural issues such as ethics and safety as well as competency related training and by providing two way communication channels through an employee portal;
- Reinforce how important our culture is to our success as an organisation by enhancing and automating HR services and processes for recruitment, remuneration and performance management and providing an employee portal which supports communication channels and provides consistent, accessible and relevant data to employees;
- Developing a capable workforce by empowering users to self-serve and select the tools and information needed for their job role without the need for significant training and support and by providing positive, hassle free end user experiences to capitalise on the significant IT literacy skills of the organisation and user experience with technology and applications in the home environment;
- Identifying productivity improvements and cost savings to offset real wages growth by automating highly manual processes, mobilising employee related data capture processes and providing accurate real time employee data as input to key processes of work scheduling, safety management and other productivity driven initiatives;
- Reduction of corporate costs that facilitate downward pressure of Network Tariff increases by automating highly manual processes and providing accessibility of user, employee related information; and
- Empowering users to self-serve and select the tools and information needed for their job role without the need for significant training and support.

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Investment Context

Endeavour Energy has been refining and strengthening its approach to developing systems to support employee self-service and user competency for a number of years and recognises that effective cultural change, employee engagement and capability will be achieved through a combination of process re-engineering, automation improvements and behavioural change supported by user and process centric IT systems.

Investment in Endeavour Energy's technology will continue to be instrumental in assisting the Corporate and Support functions in facing service and cost challenges and will be targeted to achieve:

- Technology that is used to enable automation, improve accessibility and availability of information;
- Technology that empowers staff to deliver improvements from the ground up rather than the top down;
- Automated user self-serve solutions that support end to end processes and minimise long term training and user support requirements;
- Reduction in the burden of back office processes on the wider staff through enhanced self-service capabilities for example, online timesheets, office in a truck;
- Leveraging existing technology and applications to lower administrative costs and maximise utilisation of systems and applications by users;
- Investment in web front-end and workflows to shift workload from manual to more value add activities;
- Improvement in data quality to support organisational objectives requiring timely and accurate information for management of staff and work schedules; and
- Continued delivery of assured business operations for the delivery of critical support services.

In the next five years Endeavour will leverage investment in key systems to drive continuous improvement and employee capability, in particular user friendly web front ends which will integrate key back end systems such as Ellipse, the intranet, internet and the document management system. Endeavour Energy's intranet will be the primary access point for all employee information and employee tools such as the employee portal, e-learning modules and communication and collaboration tools.

A key success factor will be the ability to "mobilise" systems and data to enable staff to work more efficiently when they are in the field or out of an office environment. A number of user centric business transformation projects have commenced in 2013/14 that will provide the basis for mobility, user self-serve and manager self-serve such as the Employee Portal Improvement project, Office in a Truck and Citrix mobile solutions. Enhancements will continue in the next AER period to capitalise on new technologies and increased user experience and expectations. A key assumption is that every field staff member or contractor will have access to a mobile device.

The business priority to deliver operational efficiencies and increase customer value is a key driver for the investment in workflow, integration and collaboration tools. These tools will

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leverage the existing digital information assets by more efficiently obtaining approvals and endorsements of transactions and limiting multiple touch points by the user and duplicated paperwork distribution and archiving. This requirement is included in the Information Management Strategy, and has been identified by multiple business processes as a key initiative to improving productivity and delivering cost savings. Technology will be leveraged to deliver productivity improvement solutions incrementally across several business processes such as Finance, HR, Procurement and Safety. This technology is central to maintaining integrity of data and providing a single source of the truth for the compliance process.

Investment Roadmap

Initiatives included in the ICT Investment Roadmap for 2015-2019 have been selected on the basis that they are clearly linked to the priorities of the business; comply with NER capital guidelines, resource availability for each financial year and to provide benefits directly linked to the strategic objectives of the organisation. The cost is in thousands of dollars (\$'000) and includes total regulated and unregulated investment. (96% of this is attributable to standard control services.)

Networks NSW Category	Major Program	Program	2015	2016	2017	2018	2019
Risk	Employee Portal improvements	Web Technical Currency					
		Usable Platform					
Improve	Employee Portal improvements	External Collaboration					
Improve	LMS Process enhancements	LMS Process enhancements					
Improve	HR workflow, automation & collaboration	Document routing program; e-recruitment program; HR Automation and workflow					
Improve	Improvements to Automation of timesheets	Improvements to Automation of timesheets					
Totals							

NER Compliance

Investment in Endeavour systems over the next five years is required to respond to future employee requirements and expectations to support them in the continued delivery of supply. The table below shows the justification of major programs for technology investment required to support Endeavour Energy's technical environment.

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Mapping to the relevant “Capital expenditure objective(s)” (Chapter 6, National Electricity Rules)
The forecasted capital expenditure is considered necessary to achieve:

Guidelines	Major Program	Explanation
<p>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</p> <p>(i) the quality, reliability or security of supply of standard control services [prescribed transmission services]; or (ii) the reliability or security of the distribution system through the supply of standard control services [prescribed transmission services],</p> <p>to the relevant extent:</p> <p>(iii) maintain the quality, reliability and security of supply of standard control services [prescribed transmission services] and (iv) maintain the reliability and security of the distribution [transmission] system through the supply of standard control services.</p>	<ul style="list-style-type: none"> Employee Portal improvements LMS – Process enhancements 	<ul style="list-style-type: none"> The proposed expenditure for the Performance through People process seeks to deliver customer reliability through improved access to information, learning and integration of systems for employees in all locations and job roles.
	<ul style="list-style-type: none"> HR workflow, automation & collaboration Improvements to Automation of timesheets. 	<ul style="list-style-type: none"> The proposed expenditure for the Performance through People process seeks to deliver customer reliability through improved productivity and reliability through the automation of key resource processes.

Prioritisation

Management of demand for ICT funding required consultation with the General Managers People and Services and relevant branch managers with endorsement from the Executive Leadership Team. The key focus was to find the balance between recurrent expenditure needed to maintain high level of performance for current systems and functionality and to equip the business with new functionality needed to achieve strategic outcomes in a constrained expenditure environment. Only those projects where “do nothing “was not an option have been included in the investment program. The result of this approach is 33% on technical currency projects to deliver an assured business platform for operating the business and delivering supply. Only “improve” projects where positive benefits, improved risk mitigation, cost avoidance or cash savings can be realised within the 4 years of this review period have been included in the program.

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Leveraging Past Investment

Endeavour has continued to invest in technical upgrades for Ellipse, Web Technology and Records Management to mitigate risk to business operations and to leverage functionality enhancements delivered with major software releases. This investment approach has now placed Endeavour Energy in a position where it can now further leverage these investments to develop and enhance these systems to achieve business productivity, improved data quality and reliability as well as improved compliance capabilities in a capital efficient manner through the introduction of automation and workflow capabilities made available in these technologies.

Prudent Cost Management

The capital constrained environment has required Endeavour to look at capital efficient options to meet the critical needs of the business. The architectural principles that will be applied to achieve the required capital expenditure outcomes are as follows:

- Capital expenditure forecasts have a high reliance on re-using existing systems and their functionality to reduce the level of capital investment required to support the business in achieving operational and strategic objectives over the next five years and
- Where new functionality is not available in house, for example the Learning Management System, COTS software or Software as a Service solution (SAAS) will be sourced through market testing to provide cost effective solutions.

To reduce operating expenditure and improve technology service delivery to business leaders and users, during the next five years, ICT will secure best quality/best cost application and business support services through market testing as well as exploiting “the power of three”. In the last year of the current AER period new outsource contracts were executed to secure specialist application vendors for Enterprise Resource Planning, Reporting and Integration support services.

Strategic Objective Alignment

Endeavour Energy’s HR strategic plan is underpinned by three areas of strategic focus:

- Engaging Employees;
- Aligning Culture; and
- Building Capability.

The strategic objectives for each focus area are:

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Focus Area	Engaging Employees	Aligning Culture	Building Capability
Strategic Objective	<ul style="list-style-type: none"> Make the case for change more compelling Accelerate development of leadership capability Improve effectiveness of communication 	<ul style="list-style-type: none"> Reinforce cultural priorities Align people, policies and processes to cultural priorities Align rewards strategy to business and cultural priorities Align employee relations agenda to desired business and cultural outcomes 	<ul style="list-style-type: none"> Develop Strategic change management capability Operationalize workforce planning practices Improve career development practices Improve core employee services and support

Investment in technology will be targeted to facilitate the achievement of the following strategic objectives for Performance through People:

- Accelerate development of leadership capability;
- Improve effectiveness of communication;
- Aligning people, policies and processes to cultural priorities and
- Improve core employee services and support.

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The table below links the strategic objectives of Performance through People to investment initiatives.

Strategic Objective	Business Drivers	Investment Initiatives	ICT Program
Accelerate development of leadership capability	Building of core leadership competencies and alignment of leadership capability to our desired culture	<ul style="list-style-type: none"> Automation of processes to move from manual to more value-add activities. Extension of mobility solutions to the field to support ESS/MSS and timesheet entry. LMS enhancements and e-learning modules (corporate, technical & apprentice). 	<ul style="list-style-type: none"> LMS process enhancements HR document workflow automation and collaboration Employee Portal Improvements.
Improve effectiveness of communication	Build understanding of purpose, values and business objectives.	<ul style="list-style-type: none"> Building of effective communication channels to enable employees to access the information they need Empowering of staff on an anywhere, anytime self service capabilities. 	<ul style="list-style-type: none"> HR document workflow and collaboration Employee Portal Improvements.
Aligning people, policies and processes to cultural priorities	Reinforce how important our culture is to our success as an organisation	<ul style="list-style-type: none"> Communicating key messages of safety and change Delivering cost effective HR services and processes; especially in relation to remuneration and performance management Enhanced communications and e-learning capability. 	<ul style="list-style-type: none"> LMS process enhancements Employee Portal Improvements.
Improve core employee services and support	Developing a capable workforce Identifying productivity improvements and cost savings to offset real wages growth	<ul style="list-style-type: none"> Upgrading existing systems critical to delivery of services Digitisation of employee records to improve efficiencies in the organisation, tracking and consumption of employee data by HR and other areas of the business Workforce planning and allocation of appropriate resources Management of the aging workforce and skills transfer through the provision of continuous development of staff Capturing of real time information at source with validation. 	<ul style="list-style-type: none"> HR workflow, automation and collaboration Automation of timesheets LMS process enhancements.

Capital Investment Programs

The following section outlines the four major investment areas of the following:

- Employee Portal Improvement;
- Learning Management System (LMS) Process Enhancements

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- HR Workflow, Automation and Collaboration; and
- Timesheet automation.

Employee Portal Improvements

1. Technical Currency Program

This program of work will support and manage the technical currency of web applications to provide up-dated versions and fix packs for maintaining IBM Portal and WCM; IBM Connections and Google Search Appliance renewals. These upgrades will also provide functionality required for further business process enhancement projects listed in the Capital investment program.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> • Do nothing is not desirable as unsupported software contains a potential risk of vendors no longer providing patches, updates or other technical support services for the product. This risk would lead to increased costs to maintain and support. Planned improve projects will not be enabled. This option will also attract higher support costs associated with the maintenance of a legacy system. This option is not considered economically justifiable due to the economic risks of increasing operational support costs. These costs will include vendor premium rates to support old technology and the cost of maintaining in-house skills and knowledge to support this technology.
Maintain technical currency of web applications	<ul style="list-style-type: none"> • Upgrading of web applications within prescribed technical currency timeframes.
Preferred case	<ul style="list-style-type: none"> • Maintain technical currency of web applications within planned technical currency program is the preferred option in order to mitigate risks and increases to operational support costs associated with non-compliance to technical currency. Where feasible, enhancements will be bundled with upgrade projects to minimise capital investment requirements and to minimise impact and disruption to end users and business as usual.

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2. Usable Platform

This program of work aims to make the Endeavour Energy Intranet accessible from outside of the network. Through deployment of a web server in the DMZ will enable highly available, secure access to the intranet for employees and contractors to support collaboration and mobility initiatives.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">To support Mobility and extranet capabilities our DMZ requires configuration changes. If we do nothing and maintain status quo, then we cannot provide access to corporate information 24x7 from any location. This excludes extranet, external collaboration and mobility options. This option is not economically justifiable due to the missed opportunity of realising cost savings through automation of business processes and mobility. The cost savings are targeted at implementing technology to enable mobile employees to assess, modify and relay information to corporate systems from mobile devices in the field.
Upgrade DMZ and deployment of web server in DMZ	<ul style="list-style-type: none">New hardware and configuration changes to allow AD authentication of external users will provide the secure access to our DMZ. This will provide benefits in mobile/web integration enhance knowledge management, increase teamwork with external staff, access to most recent information from any location.
Preferred case	<ul style="list-style-type: none">Upgrade DMZ and deployment of web server in DMZ.

The primary costs associated with this program of work assume that no new software or hardware purchases will be required; configuration and delivery costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. There is not expected to be a material increase in operating expenditure associated with this project as support and maintenance agreements are currently in place with the outsourced service provider.

This program of work will provide the platform required for the external collaboration program of work, which will provide productivity improvements through mobility and process automation.

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3. External Collaboration

Building upon functionality provided through the upgrade of IBM Connections, this program of work will deliver an externally facing version of Connections which will enable third parties to collaborate with Endeavour Energy in a secure manner. This will enable online discussions, document development and workflow features to improve business process flows between organisations, particularly within the asset management and human resources area.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> If we do nothing our Collaboration environment is only internal facing. This allows internal users to collaborate and share documents and contribute together online internally. But excludes external staff or contractors also being able to collaborate whilst out of the office or on hand held devices. This option is not economically justifiable due to the missed opportunity of realising cost savings in communication and productivity improvements through leveraging off collaborative technology and mobility platforms.
Purchase additional licences	<ul style="list-style-type: none"> Purchase additional licences for IBM Connections and configure for ASP's, contractors and vendor management. Staff will be able to contribute to online discussions and document development out of the office. Field staff will be able to access Safe Work Method Statements from their vehicle without relying on the hard copies carried with them.
Preferred case	<ul style="list-style-type: none"> Purchase additional licences.

Software Licence Costs have been estimated using quotes sourced from IBM. It is estimated that approximately 200 licences will be required, making it a low cost investment with positive benefits for key asset and employee processes. Impact on operating expenditure for support and maintenance has been included in estimated growth forecast.

Learning Management System (LMS) Process Enhancements

The LMS Process Enhancements program intends to enhance and further automate the training delivery and training management processes of the Employee Self Service system targeted for implementation in 2013/14 and to capitalise on the enhancements made for safety training in the 2014/15 financial year.

The enhancements will focus on self-service training nomination and approval, provide an integration platform for web based delivery of non-safety related training, assessment and methods for automating the update of face to face training delivery assessment and completion results.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Do nothing option will fail to achieve required cost savings in the delivery and management of training and will result in an increase in manual effort required for delivery and management of corporate training programs. This option is not considered to be economically justifiable as the total cost of “face to face” training is prohibitive due to the cost of provisioning training facilities and resources, and the loss of productivity during this time.
Software as a Service	<ul style="list-style-type: none"> Software as a service may be considered for the hosting of the e-learning modules but Endeavour Energy has existing web capability to host e-learning modules.
Buy / Build	<ul style="list-style-type: none"> As a new organisation wide training management system, will be rolled out as part of the Employee Self Service portal it is not economical to buy or build a separate system for corporate training.
Enhance Existing Systems	<ul style="list-style-type: none"> In order to provide a single source of training data, the employee portal system will be enhanced to provide more advanced capabilities and interfaces for corporate training.
Preferred case	<ul style="list-style-type: none"> Enhance Existing Systems - A new organisation wide training management system, to be rolled out as part of the Employee Self Service portal, is targeted for implementation in 2013/14 and integration enhancements for the Safety Training program of work will commence in 2014/15 the LMS enhancement program will leverage the existing investment as a foundation for integrating corporate training management and the delivery of a single source of training delivery and management including the development of compliance and technical training modules.

The costs for the LMS Enhancements program of work have been derived using the following rationale:

- An assumption has been made that no additional software costs will be required and that the development of new training modules and functionality are included in configuration and integration costs;
- New interfaces are expected to ensure the capture and integration of training nominations, training attendance and competency results for both online and face to face training. The interfaces will be based on the integration capabilities developed as part of the safety training program; and
- Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission. The model applies a factor of expected project duration, complexity and integration needs to derive the program estimate.

The new enhancements and interfaces portal are expected to be implemented in the second and third years of the AER period, after the bedding down of the Employee Self Service Portal and the commencement of the safety training program. Associated operational impact's such as

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uplift in support costs will be expected from the third year onwards, however as the program is based on enhancements to existing systems, operating expenditure impacts will be minimal and likely based on an uplift to existing support costs due to the nature of the changes in functionality.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The LMS process enhancements program will commence after the Safety Training and is well positioned to leverage off the technology developed in this program with reuse of interfaces and learning portals.

Program	Runs in Parallel with:	Supported by:	Supports
Learning Management System (LMS) Process enhancements		Safety Training	

The expected benefits of compliance in areas such as ethics, corporate standards and technical training, development of leadership competencies, recording of competencies, risk reduction, reduction in face to face training costs and training management costs are expected to commence from the third year of the AER period and continue throughout the AER period.

HR workflow, automation & collaboration

The HR workflow, automation and collaboration program of work intends to address the need for workflow management automation for document centric processes. The overall objective of this program of work is one of improved productivity, record keeping and access to approved documents through:

- Elimination of manually tracking document status, process step and location;
- Elimination time and effort spent in rework due to lost documents;
- Faster end to end process through reduction and elimination of process steps;
- Transparency through continuous document tracking; and
- Provision of a complete audit trail including tracked changes, reviews and approvals.

It is expected once capability is established for workflow and automation of HR documents, these capabilities will be extended to other highly manual paper based approval processes.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> This option will not enable required productivity improvements to be realised. Current inefficient paper based processes will remain in place. The risk of doing nothing is that these manual processes will continue to increase the cost of operations and the targets to limit labour costs to CPI increases will not be achieved. This option is not considered economically justifiable as the cost of manually completing these processes will continue to increase and exceed the cost of automated processes.
Purchase and configuration of a dedicated COTS application	<ul style="list-style-type: none"> A COTS application that delivers workflow features is an added cost to the business when existing systems contain these capabilities to improve collaboration and workflow.
Use existing system capabilities	<ul style="list-style-type: none"> Existing systems will be utilised to support collaboration, automation of business processes and workflow capabilities for staff. Content Server and IBM Connections have a workflow component to allow validity, audit checks, tracking options online to eliminate paper work and paper chasing processes. Integration of workflow capabilities between applications can also be implemented.
Preferred case	<ul style="list-style-type: none"> Use existing system capabilities provided by Content Server, Ellipse, IBM Connections, MS Active Directory and MS Exchange to deliver solution.

The primary costs of implementation of this solution will be associated with configuration and integration. These costs have been estimated using a standard estimation model applied to all projects within the submission which applies a factor of expected project duration, complexity and integration needs to derive the program estimate. No additional licences will be required to be purchased.

Through utilisation of existing system capabilities, the impact on operating expenditure for baseline support is expected to be minimal, additional support and maintenance costs will be incurred for IBM Connection Forms and for Content Server. These costs have been allowed for in the operational expenditure forecast.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The HR Automation program will commence in the first year of the AER period and will run in parallel with the Finance Automation program. This will ensure technology and architecture can be developed to support the automation of both processes and systems will be optimised to support the requirements of these automated processes.

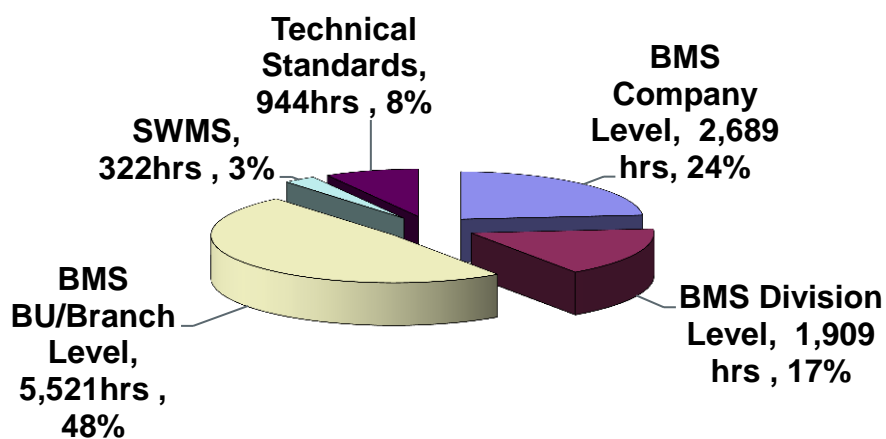
Program	Runs in Parallel with:	Supported by:	Supports
HR Automation	Finance Automation	Field Force Automation	Finance Automation

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This program of work will result in productivity improvements by taking manual and labour intensive steps out of existing processes. The balance of this productivity improvement lies with the document creator and to a lesser extent with the reviewer and approver. The outcome will be that the elapsed time between document creation and final approval is reduced and therefore the FTE-cost per document will come down.

Given that Endeavour is a process and document centric organisation; there are many touch points for this case for change within the organisation. The benefits are across all employees that are involved in the creation, review, approval and dissemination of documents. The benefits of productivity are therefore attributable to all roles in document centric process and are cumulative across the organisation.

The estimated annual effort savings are summarised for key document centric process in the diagram below:



From a risk management perspective, this program of work introduces a new capability to the organisation where at all times the status and audit trail for all approved documents is known and available if and when required.

Improvements to Automation of Timesheets

Improvements to the basic online timesheet to be implemented as part of the Employee Self Service system in 2013/14 are targeted for the 2014/15 financial year with a small amount carried over into 2015/16. The automated timesheet enhancements will implement an enhanced web based timesheet which will complement work scheduling and dispatch automation by including allocated job packets and work orders directly into the timesheets, automating all but the essential data entry primarily for field based workers.

The program assumes that there is already a mobile device available at least at crew level and will develop new timesheet data entry forms using existing mobile form development and delivery via the employee self-service software. The improvements will interface rostered, allocated and actual time and attendance data between Ellipse and mobile solution thus supporting the fatigue management initiative by collecting forecast and actual hours on a timely basis.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Doing nothing will not allow the organisation to fully realise the benefits of an online integrated time and attendance tool and would restrict the opportunity to achieve further productivity savings required to deliver value to the customer.
Enhance existing systems	<ul style="list-style-type: none"> Existing systems will be enhanced to further streamline the work scheduling and dispatch process to pre-populate and cost timesheets to reduce time spent in the field undertaking data entry activities.
Preferred case	<ul style="list-style-type: none"> Enhance existing systems is the preferred option.

The costs for the improvements to the automation of timesheets have been derived using the following rationale:

- An assumption has been made that no additional software costs will be required as the improvements will leverage the existing investment in the Employee Self Service System and mobile form development technology;
- Existing interfaces will be enhanced to capture work allocated to crews and employees as part of shift rostering and workforce scheduling and to include online validations against the Ellipse time and attendance, labour and plant costing modules. The interfaces will be based on the integration capabilities already developed for online timesheet entry and will include rostered times for shift workers and allocated work for field workers and project staff; and
- Configuration and integration costs have been estimated using a standard estimation model applied to all projects within the submission. The model applies a factor of expected project duration, complexity and integration needs to derive the program estimate

The enhancements to the automated timesheets are expected to be implemented in the first year of the AER period, after the bedding down of the basic online timesheet being implemented as part of the Employee Self Service Portal. Associated operational impact's such as uplift in support costs will be expected from the second year onwards, however as the program is based on enhancements to existing systems, operating expenditure impacts will be minimal and likely based on an uplift to existing support costs due to the nature of the changes in functionality.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Improvements to automation of timesheets program will commence in the first year of the AER period and will support the standardisation of rostering and workforce scheduling to manage fatigue and the integration of these to automated timesheets.

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Program	Runs in Parallel with:	Supported by:	Supports
Improvements to automation of timesheets		Field Force Automation	<ul style="list-style-type: none">• Workforce Scheduling• Fatigue Management

The expected benefits of reduction in costs associated with manual entry, reconciliation and correction of timesheet data and the reduction of costs associated with the scanning and storage of hardcopy timesheets are expected to commence mid-way through the second year of the AER period. The new processes will take time to bed down and full realisation of savings, compliance to time and attendance policies and optimisation of workforce planning and resource allocation are not expected until the start of 2016/17.

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Benefits

To identify the success of return on investment, a benefits management plan has been established for each initiative. The table below lists the key initiatives with the indicative cost and associated benefits. The cost is in thousands of dollars (\$'000) and includes regulated and unregulated investment.

Program Title	Program Description	Total Cost	Business Benefits
Employee Portal Improvements	<ul style="list-style-type: none"> Building on user centric web front end to Ellipse to be implemented in 2013/14(training management, leave management, personal details and timesheet entry.) Development of online employee collaboration tools Web front end (portal) integration to business processes, procedures, employee communications Improved design for mobile devices. 		<ul style="list-style-type: none"> Reduction in operating costs by reduction on manual data entry Reduced costs associated with scanning, printing and storage hardcopy forms Reduction in HR & ICT support costs <p>Risk Mitigation</p> <ul style="list-style-type: none"> Compliance to HR policies
LMS – Process enhancements	<ul style="list-style-type: none"> Further development of e-learning modules (corporate, technical & apprentice) Develop and rollout new and refresher training modules to employees, contractors and vendors Stable e-learning hosting solution Improved integration to Ellipse training modules and employee portal Increased self-serve capability. 		<ul style="list-style-type: none"> Reduction in operating costs by reducing the amount of manual data entry required to manage training nominations and update training records Reduced need for manual intervention to reconcile training records Reduced costs associated with delivery of face to face training as more education can be accessed online Reduced costs associated with re-booking of external training courses due to non-attendance <p>Risk Mitigation</p> <ul style="list-style-type: none"> Increased compliance in areas such as ethics and safety due to education programs Reduced risk of non-authorized personnel working on network Employee Engagement Enhancement in leadership and core competencies and qualifications to meet future requirements of the network business and to address the issues associated with an aging workforce.

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<p>HR workflow, automation and collaboration</p>	<ul style="list-style-type: none"> • Established program of work to establish document routing, data capture and control for HR related functions. • Automation of manual HR functions and approval processes such as study assistance, job evaluation, performance appraisals etc. • Enhancement projects for process automation and integration, e.g. integration of on boarding activities and data with Ellipse • Purchase of additional modules for staff requisitioning and scheduling of recruitment activities • Tracking of assets assigned to employees to enable easy updates throughout the lifecycle of asset assignment and update on termination of the employee • Workflow capability. 	<ul style="list-style-type: none"> • Reduction in operating costs by reducing manual record keeping and printing, scanning and storage of application forms and supporting documentation • Automating of data entry and workflow capability to reduce administration time spent on follow up, approval and re-entering of data • Automating the staff requisition process and reducing manual handling of forms • Reduction in operating costs by reducing manual record keeping and storage • Increase in data integrity, timeliness and auditability and reduction in time spent on re-entering data, follow up, reconciliation and data rectifications <p>Risk Mitigation</p> <ul style="list-style-type: none"> • Reduced risk of non-compliance to policy as applications and approvals are automated with inbuilt business rules.
<p>Improved automation of timesheets</p>	<ul style="list-style-type: none"> • Extension of mobility solutions to the field to support ESS/MSS and timesheet entry. • Integration of work scheduling, assignment and completion information with timesheet. 	<ul style="list-style-type: none"> • Reduction in costs associated with manual entry of timesheet data • Information defaulting from scheduling and work assignment activities reduce costs associated with follow up and rectification of data entry errors • Reduction in operating cost of scanning and storage of hardcopy timesheets • Optimisation of workforce planning and resource allocation <p>Risk Mitigation</p> <ul style="list-style-type: none"> • Improved compliance to Time and Attendance, Overtime and Allowance and costing policies.

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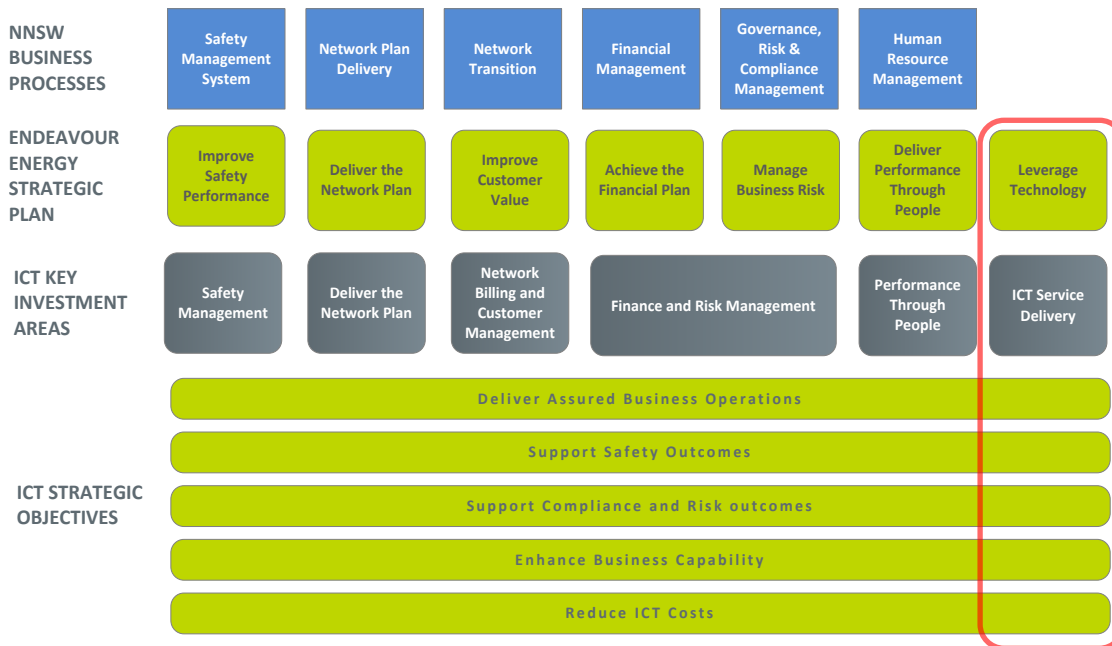
IT SERVICE DELIVERY

Background or Overview

The purpose of Endeavour Energy's ICT Investment plan is to leverage information and communications technology to utilising technology to deliver business outcomes in the most effective and efficient way and enable Endeavour Energy to achieve its corporate objectives as shown in the Diagram below.

The primary role of the Technology function within Endeavour is to ensure the reliability, performance and security of Information and Telecommunication and integrate with Operational/Grid Technologies One of the main strategic elements of the plan is the delivery and operation of an assured business platform to ensure the availability and integrity of computing resources to run all business systems at agreed performance levels, in a cost effective manner.

ALIGNMENT OF NNSW GROUP OBJECTIVES TO ENDEAVOUR BUSINESS AND ICT INVESTMENT PLAN



Endeavour Energy's technology strategic plan is underpinned by four strategic objectives:

- Deliver Assured business Operations by designing , implementing and supporting a scalable, reliable, secure and cost effective platform for business systems;
- Support Safety Outcomes by leverage technology to empower and educate employees, vendors the public to make safe choices;
- Support Compliance and Risk Outcomes by leverage technology to facilitate sound commercial decisions to drive sustainable operations and performance and maintain a high level of compliance;
- Enhance Business Capability by take advantage of technological advancements, integration of IT and OT and ensuring maximum business value is achieved through IT implementations; and

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IT SERVICE DELIVERY

- Reduce ICT Costs by simplifying the IT asset landscape, driving re-use of technology and reducing operational costs through sourcing, marketing and total cost of ownership solution selection.

The four major programs of work for technology investment required to deliver IT Service Delivery for the organisation are as follows:

- IT Infrastructure Asset Management and Services;
- IT Communications Asset Management and Services;
- ICT Operational Services; and
- Information Security.

Total investment of [REDACTED] non-recurrent capital investment over the next five years is required to deliver the four major investment portfolios needed by the business to achieve business outcomes. A further [REDACTED] of recurrent capital expenditure will be directed to technical currency of existing systems and hardware to maintain current performance requirements cost effectively.

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IT SERVICE DELIVERY

Business Context

Endeavour's strategic plan focuses on operating as a network only organisation. Leveraging technology is a key ICT objective to position Endeavour Energy for major business transformations while delivering an assured business operations in a cost effective manner.

The core processes covered by the technology strategic plan are:

- ICT operations and support – this process manages the provisioning, capacity, performance and availability of the computing, networking and application environment including IT services desk and IT help desk;
- Business continuity – the development, maintenance and testing of recovery processes to mitigate risks of hazardous events impacting business operations; and
- Project management - the delivery of Information and Communication Technology (ICT) solutions within budget, on schedule, and in such a way as to maximise the benefits realised by Endeavour Energy.

ICT services are essential to delivering the underlying computing capability to support all business system operations and are a key enabler for the achievement of strategic objectives and initiatives. The purpose of the ICT program is to address three critical issues:

- Increasing operational risk – availability of systems and applications to perform daily transactions;
- Inflexible IT infrastructure - proprietary architecture and vendor lock-in agreements; and
- Increasing operational costs – licensing, maintenance and support costs.

Endeavour Energy manages its ICT platform by a combination of in-house and outsourced services. As a prudent operator Endeavour Energy has been selective in adopting the latest technologies and has made the commercial decision to retain existing technologies where the following criteria apply:

:

- Cost of migration to new solutions is prohibitive;
- While the technology is still serving the needs of the business the risk of upgrading or migrating does not necessarily outweigh the benefits;
- Up to a point it has been less expensive and easier to expand capacity to the existing systems as and when required; and
- Asset life should be squeezed to an absolute maximum.

Technology investment is undertaken where the business is exposed to the following risks:

- Systems that approach EOL (end of life) and EOS (end of support) become more expensive to maintain and support;
- Parts become scarce and business critical systems are at risk of not being repaired should they fail;
- Technology is advancing rapidly; Intel targets a doubling of processing power every 18 months. The longer hardware remains in the data centre the relative computing power becomes exponentially less than current offerings;

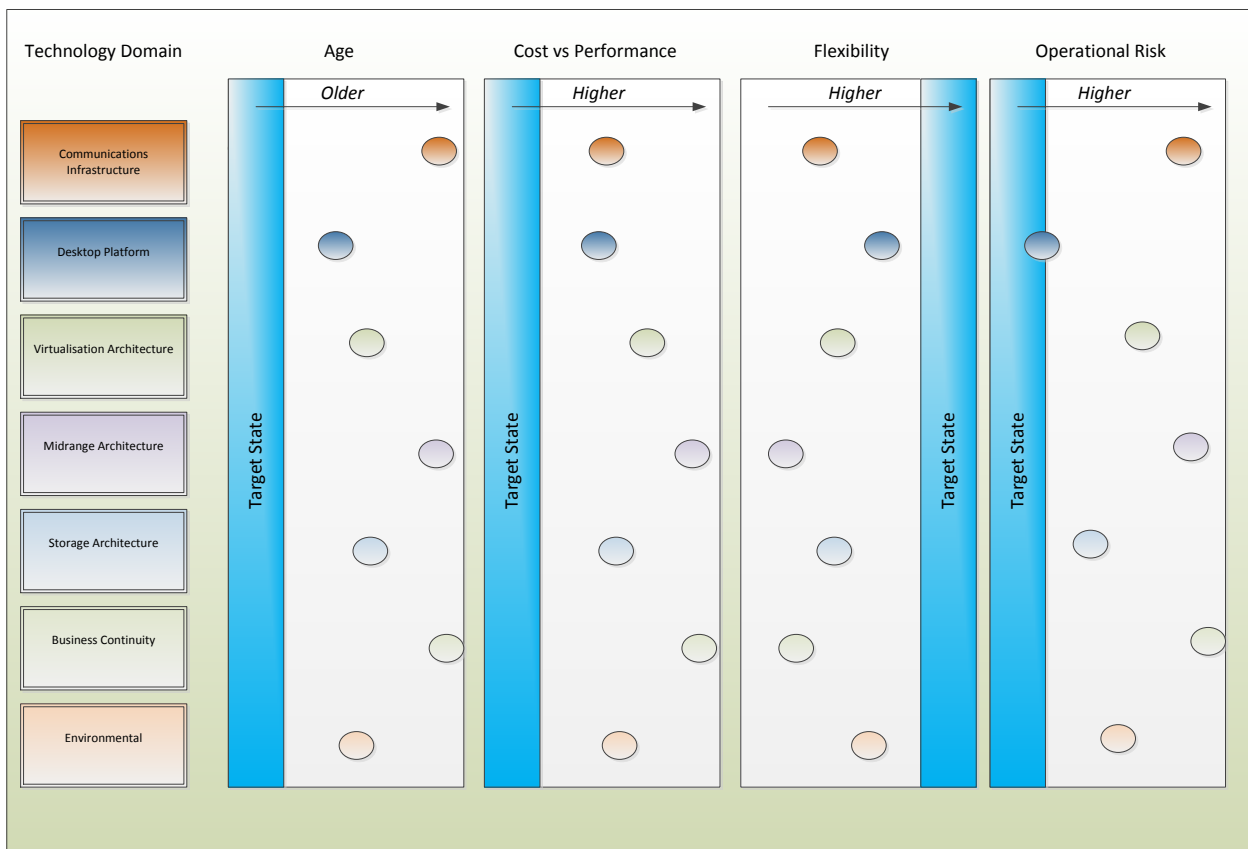
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IT SERVICE DELIVERY

- Computing power costs decrease rapidly as new product offerings replace older technology;
- In many cases the cost of maintaining old equipment is greater than the cost of the latest technology available;
- Current offerings address the risk of hardware failure through included maintenance; and
- Power and environmental control requirements are much greater for older hardware and therefore incur greater running costs.

As a result the age profile of assets and business risk position varies throughout the Endeavour technologies stacks. The following diagram identifies the main technology elements in the context of the IT infrastructure and Communications programs:

- Age -Time elapsed since the system has been implemented. e.g. Endeavour Energy's HP-UX environments have been in production for close to a decade;
- Cost vs. Performance - Lower (operational) cost vs. performance represents better value for Endeavour;
- Flexibility - The ability to adapt, change, migrate, scale and upgrade easily; and
- Operational Risk - End of life for the product, end of vendor support for the product, scarcity of resources and supplies to support, criticality of the system to the business, difficulty of backup and disaster recovery.



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IT SERVICE DELIVERY

In previous years Endeavour has invested in major projects to upgrade the corporate LAN network. The upgrade was undertaken to address the EOL of LAN devices. The refresh programme re-aligned the network architecture to be in line with industry best practice and has laid the foundation for IP telephony and collaborative communications. The WAN now requires further development and redesign to support this new technology.

Several architectures will be refreshed, upgraded and re-architected in the next AER period. Some services are in isolation of others but most will have interdependencies on each other. Dependencies also include EOL (end of life) or EOS (end of support) from a service perspective.

Endeavour Energy relies on its communications infrastructure to deliver ICT services to offices and depots in its franchise area. Usability and performance of applications at these locations is poor and Endeavour requires significant investment in communications infrastructure over the next 5 years to enable the business to work efficiently. Without an investment in communications infrastructure, the platforms will be at risk of failure and business users will be frustrated due to prolonged delays in accessing and processing data. This could lead to increasing ICT costs and in some cases could lead to loss in revenue and productivity.

There are four major programs of work for technology investment required to deliver IT Service Delivery for the organisation are reflect balance between cost and risk and the need to provide the technology capability meet business objectives and priorities . Each program of work is outlined including investment context, investment roadmap, business drivers, and benefits in the following sections.

- IT Infrastructure Asset Management and Services
- IT Communications Asset Management and Services
- ICT Operational Services
- Information Security

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NER Compliance

The table below shows the justification of major programs for technology investment required to support Endeavour Energy's technical environment to ensure the business can continue to meet regulatory and market supply requirements.

Mapping to the relevant "Capital expenditure objective(s)" (Chapter 6, National Electricity Rules) The forecasted capital expenditure is considered necessary to achieve:		
Guidelines	Major Program	Explanation
<p>6.5.7(a)(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:</p> <p>(i) the quality, reliability or security of supply of standard control services [prescribed transmission services]; or (ii) the reliability or security of the distribution system through the supply of standard control services [prescribed transmission services], to the relevant extent; (iii) maintain the quality, reliability and security of supply of standard control services [prescribed transmission services] and (iv) maintain the reliability and security of the distribution [transmission] system through the supply of standard control services;</p>	IT Infrastructure Asset Management and Services	The proposed expenditure for this portfolio seeks to deliver a reliable and sustainable operating system to support critical user applications and functions across the business to continue to supply electricity reliably; a scalable and high functioning architecture platform to support business applications and processes to maintain the quality, reliability and security of supply; deliver storage architecture to meet growing demands of electronic data and digital.
	IT Communications Asset Management and Services	The proposed expenditure for this portfolio seeks to implement next generation WAN technology; consolidate voice and data services and functionality to underpin Endeavours communications platform across the network to support business and customers to continue to meet supply requirements and resulting in reduced operational expenditure and improved quality and reliability of communications.
	ICT Operational Services	The proposed expenditure for this portfolio seeks to deliver services to meet technology and application performance and capacity objectives resulting in reduced operating cost and improved IT performance and services and to implement critical processes and technology to deliver IT 'return to service' and system continuity resulting in reduced risk in the event of hazardous or disastrous events.
<p>6.5.7(a)(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;</p>	Information Security	The proposed expenditure for this portfolio seeks to deliver secure and compliant IT applications, systems and infrastructure to support the business to meet electricity supply requirements and regulatory compliance across all areas of the business.

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IT INFRASTRUCTURE ASSET MANAGEMENT AND SERVICES

The Infrastructure domain defines the roles, policies, standards, and technologies that provide and manage Endeavour Energy's computing platforms and deals with the interconnection and interoperability of these various components including hardware and operating systems. The business outcomes include:

- Supports the flow and processing of information, both internal and external, in an efficient manner;
- Provides scalable and reliable infrastructure to support the seamless and transparent delivery of information to the State's agencies and citizenry;
- Promotes knowledge sharing and increases resource flexibility; and
- Encourages stewardship and fiscal accountability.

The investment plan covers the following:

- Desktop Platform – End User Computing;
- Midrange Architecture;
- Storage Architecture;
- Virtual Architecture (Intel);
- Environmental; and
- Mobility Infrastructure.

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Business Drivers for Technology Investment

The key drivers for determining the IT infrastructure asset investment plan are to reduce the ongoing operational cost of IT whilst maintaining technical currency, ensuring business continuity and improving the capacity, availability and flexibility of the IT landscape at Endeavour Energy.

- Drive down costs of delivering projects by rationalising and consolidating IT server and storage asset base and utilising technologically advanced and highly scalable hardware which will provide future capacity management and reduce the need to procure new hardware for specific projects. Licence costs for new hardware are significantly less expensive and more cost effective in comparison to historical costs;
- Drive down costs of operational support by utilising commodity hardware, replacing old technology with new and negotiating new and more flexible support contracts. More technically current IT assets reduce the necessity to hire specialist, high premium resources to deliver support;
- Take advantage of technology innovations and developments in the IT marketplace to deliver significantly improved performance, availability, reliability and scalability. Technology innovations contribute to the reduction in the overall capital and operational cost of providing IT infrastructure frameworks. New and innovative technologies enable more flexible deployment and models to be delivered;
- Address the increased reliance on mobile devices and technologies by providing an assured, scalable and reliable infrastructure base on which to build a framework for mobile applications as addressed in the IT Communication Management and Service section of this chapter;
- Support business continuity by taking advantage of high availability architectures enabled by connectivity between primary and secondary data centres. This eliminates the need for dedicated DR environments as technology can be exploited to achieve high availability where required and non-production capacity can be dynamically reassigned to DR when required. New technologies can enable “self-healing” networks through automated monitoring, alerts and diagnostics;
- Manage the operational risk associated with end of life and end of support assets by ensuring technical currency of desktop, server and storage architectures. Decommission and replace high cost legacy desktop, midrange server and VM farms. Technical currency enables consolidation of the infrastructure base supporting a large number of small but significant business applications allowing application upgrade paths and the opportunity to consolidate and reduce associated support costs; and
- Improve the ability to adapt to changes in the business and industry as up to date, best of breed commodity hardware allows for flexibility of integration, sourcing, delivery and support. New technologies enable exploitation of technology advances and facilitate future upgrades which not only support IT infrastructure capability enhancements but provides the opportunity to take advantage of enhancements and upgrades to business critical applications.

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Target Environment

To achieve business outcomes, Endeavour has changed our architectural principles and standards to deliver a low cost commodity hardware platform that is shared between application servers and database servers. A high degree of virtualisation means that there is an increased capability to manage capacity and availability of systems.

Investment in IT infrastructure will be targeted to facilitate the achievement of the following ICT strategic objectives:

- Simplify the IT asset landscape;
- Reduce the operational costs of IT;
- Take advantage of technological advancements; and
- Deliver a scalable, reliable and secure platform for business systems.

In the next five years, Endeavour Energy will invest in IT infrastructure initiatives to reduce the operational costs of IT by rationalising and consolidating computing platforms, provide increased capacity and storage and take advantage of technology developments and innovations to build a solid and reliable infrastructure framework to support mobility, business continuity, integration and business intelligence.

This will encompass:

- Reducing ongoing operational costs by simplifying the number of vendors in the infrastructure landscape and negotiating competitive and flexible support contracts;
- Consolidating and reducing the number of servers over time, whilst taking advantage of advancements in technologies to increase performance and capacity;
- Building flexibility into architectures to improve the ability to perform future upgrades/additions;
- Improving the manageability and operational effectiveness of the infrastructure technologies by implementing automated monitoring and alert controls;
- Facilitating high levels of Business Continuity by enabling enhanced DR and system continuity for critical server based applications and enabling the sharing of resources at alternate sites; and
- Implementing technical currency programs to reduce the operational risks associated with end of life and end of system assets.

Desktop Platform

Endeavour's current Windows 7 desktop platform was introduced in 2012 in order to reduce the operational risk of Microsoft no longer supporting Windows XP and the lack of support for applications based on the XP operating system. A similar situation will prevail toward the end of this AER period, as Microsoft phases out Windows 7 support and other variants will be pursued.

This program of work will ensure the technical currency of Endeavour Energy's desktop operating systems as well as interoperability between Endeavour Energy's desktop platform and its core infrastructure and application architectures.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">Do nothing is not considered a viable option due to increased operating costs associated with maintaining legacy platforms. This option would also place increased risk as Endeavour would be running an unsupported operating environment. Microsoft announced an end of support date of April 8, 2014. This option is not economically justifiable as the cost of supporting out-of-support technology will continue to increase and exceed the cost of implementing current and supportable technology.
Rolling upgrades to achieve technical currency	<ul style="list-style-type: none">The rolling upgrade option is not preferred because of increased operating expenditure that is associated with having to manage multiple environments simultaneously.
One-off program to upgrade	<ul style="list-style-type: none">Upgrade elements of desktop platform in a single upgrade.
Preferred case	<ul style="list-style-type: none">One-off program to upgrade. This option reduces the costs, risks and complexity of managing multiple environments simultaneously.

The primary costs associated with this program of work include the purchase of upgraded software licenses, the configuration of a new operating environment and its roll-out. The trigger for implementation will be the risk of reduced interoperability between desktop applications and corporate systems gain legacy status.

These costs have been derived using the rationale that software licence costs will be in line with previous upgrade costs per desktop and that no additional hardware will be required. Configuration and implementation costs have been estimated using a standard estimation model applied to all projects within the submission and confirmed as reasonable against historical projects.

Expected benefits from undertaking this program of work is a reduction in costs due to technical currency, a reduction in annual support and maintenance costs and reduced points of failure to operating systems through maintenance of technical currency.

Midrange Architecture

This program of work targets the replacement of Endeavour Energy's current Unix environments and standards with a Linux based framework in an effort to implement a model that is more conducive to scalability and which can be configured to perform with high availability.

Linux provides a more cost effective architecture to deliver midrange services and a high level of standard functionality. Enterprise-class Linux has become a tier-one (top level) operating system and is therefore available with superior enterprise-class support; this support is not offered only by Linux distributors, but also by chip and hardware manufacturers, software vendors and industry service leaders around the globe.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">The current equipment is end of life and continued vendor support in the short and medium term is becoming increasingly difficult to obtain and expensive. Furthermore, in the event of hardware failure Endeavour would possibly need to seek out spare parts in the second hand market. An unsupported environment places high risk on mission critical systems, a cascading effect of this is that software vendors will not support applications running on these environments further increasing risk. This option is not economically justifiable as the cost of supporting out-of-support technology will continue to increase and exceed the cost of implementing current and supportable technology.
Buy / Build	<ul style="list-style-type: none">Configuration and implementation of new appliance based architecture, replacing old servers and consolidation of remaining servers to reduce operating costs associated with licencing and support services.
Preferred case	<ul style="list-style-type: none">Buy / Build is the preferred option as it allows Endeavour Energy to consolidate systems and enables a 20% reduction of operating costs.

The primary costs associated with this program of work assume the purchase of hardware based appliances, configuration and implementation to provide the functionality that is currently provided by the legacy Midrange Unix systems.

The primary benefits of this program relate to the new appliance based architecture which will allow Endeavour to consolidate systems and reduce operating costs by 20%.

- Reduced cost of operating mid-range server capability due to old server replacement and rationalisation;
- Reduced licence costs for more optimised and efficient hardware;
- Reduction in annual support and maintenance costs; and
- Reduction in failure points and risk of operating system failure due to technical currency of system and maintenance agreements.

Storage Architecture

At present, Endeavour Energy has several end of life or end of support storage assets that need to be upgraded as soon as possible. Storage growth is expected to rise exponentially over the next 5 years, particularly with the advent of high definition video footage of the franchise area terrain maps. It is expected that several hundreds of terabytes in additional storage will need to be allocated to support this requirement, in addition to organic and project based growth.

This program of work will build on the concept of virtual storage tiering with automated data management and will:

- Seek converged systems in the future data centre;
- Limit the number of vendor relationships and reduce complexity;
- Implement solutions that address multiple requirements, reduced cost in maintenance;

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- Develop a clear lifecycle path of products, reduce risk of entering end of life; and
- Provide maintenance management.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">• The current architecture is complex and therefore costly option. The maintenance costs under the current architecture are approximately equal to the costs of refreshing the entire environment into a simpler more agile architecture. The cost overhead of managing simpler storage architecture is also lower adding to the overall improved return on investment under a revised architecture. This option is not economically justifiable as the cost of supporting out-of-support technology will continue to increase and exceed the cost of implementing current and supportable technology.
Buy / Build	<ul style="list-style-type: none">• Purchase of hardware based appliances for Endeavour's storage requirements.
Preferred case	<ul style="list-style-type: none">• Buy / Build – The option of investing in new converged storage architecture will enable ongoing reductions in operating and licence costs compared to the current arrangements.

The primary costs associated with this program of work assume the purchase of a hardware based appliances that address Endeavour's storage requirements in terms of converged storage and reduced operating costs.

Costs for this program have been derived using the following assumptions:

- Hardware requirements have been based on storage growth forecasts with unit costs based on historical costs for similar hardware for backup and storage. Market testing will be undertaken prior to purchase to ensure optimal pricing is used considered and
- Configuration and implementation costs have been estimated using a standard estimation model which has been applied to all projects within the submission which applies a factor of expected project duration and complexity to derive an estimate.

Operating costs for support and maintenance is expected to reduce due to replacement of old servers; server rationalisation and automation of manual data management activities. Additional benefits for this program of work include the reduction in points of failure and risk associated with the loss of data due to technical currency of system and maintenance agreements.

Virtualisation Architecture

This program of work will standardise all virtual farm infrastructures to a modern fleet supporting Endeavour Energy's applications for the next 5 years. The program will consolidate and rationalise the number and mix of VMware versions in production and DR which will allow Endeavour Energy to utilise key functionality between its production and DR sites.

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The target architecture recommends that Endeavour Energy capitalise on previous investment and continue its virtualisation journey under the VMware platform towards the target state platform ESXi 5.x.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">The current platform is fragmented and some parts of it are no longer supported or cannot be upgraded further. The current architecture is up to 7 years old, during which time advancements in this technology have provided smaller, more powerful, modular energy efficient systems which provide a cheaper operating cost within the data centre. The current environment is no longer supported both at the hardware and software level, which represents a great risk given the large number of critical systems that rely on Endeavour's virtualisation architecture. This option is not economically justifiable as the cost of supporting out dated technology will continue to increase and exceed the cost of implementing current and supportable technology.
Buy / Build	<ul style="list-style-type: none">Consolidate to an up to date virtualisation platform, replace old, high cost servers and rationalisation of platforms.
Preferred case	<ul style="list-style-type: none">Buy / Build – The key benefit of moving to a consolidated up-to-date virtualisation platform is the reduction in operational costs.

The primary costs associated with this program of work assume the purchase of hardware-based appliances and licensing a virtualisation product that allows Endeavour to take full advantage of its high availability data centre architectures and operational requirements. Costs have been estimated using historical unit costs for previous purchases of server and virtualisation infrastructure and licences. Implementation costs have been estimated using a standard estimation model used for all programs within the submission.

It is expected that Endeavour Energy will realise a reduction in operating expenditure due to the replacement of old, high cost servers and through the rationalisation of platforms. Additional benefits include the reduction in failure points and risk of data loss due to technical currency and maintenance agreements as well as increased performance of the servers for end user processing.

Environmental

This program of work will develop an enterprise monitoring framework and ensure the data centres are capable of additional cooling or concentrated power requirements to support the objectives of the overall infrastructure program.

The following elements will be reviewed and upgraded under this program of work:

- Power requirements
- Cooling requirements

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- Monitoring systems
- Fire suppression
- Redundancy
- Alerting controls
- Humidity controls

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> • Endeavour has very little in the way of environmental controls and monitoring. This is critical as the on-going system health, availability and performance of critical systems and the entire data centre is not typically managed in real time. This increases the time and complexity to resolve incidents and problems within the environment. Endeavour is committed to improving the end user experience, which is time consuming and expensive to gauge, albeit inaccurately under the do-nothing approach. The current process of environmental monitoring is a highly manual process and can cause delays in reaction and repair times. This option is not economically justifiable due to the missed opportunity of realising cost savings through automation of this process. The cost savings are targeted at implementing systems to perform on-going health checks and pro-active management of the environment to optimise maintenance work and avoid expensive repairs.
Upgrade and reconfigure	<ul style="list-style-type: none"> • Upgrade and reconfiguration of environmental systems to support changing infrastructure hosted within the data centre.
Preferred case	<ul style="list-style-type: none"> • Upgrade and reconfigure will enable reduction in costs in comparison with services associated with provision of outdated environmental configurations.

The primary costs associated with this program of work are associated with reconfiguring the existing data centre environmental systems in such a way that they support and provide maximum benefit to the changing infrastructure that is being hosted in the data centres. Hardware costs have been estimated using historical knowledge from previous procurement of environmental infrastructure. Configuration and implementation costs have been estimated using a standard estimation model applied to all projects within the submission.

The following benefits are expected through undertaking this program of work:

- Reduction in costs associated with engaging specialist to provide system expertise in the event of poor system performance or failure as monitoring identifies and rectifies faults before they become significant;
- Reduction in cost of environmental controls;
- Reduction in system availability related incidents due to improved monitoring and alerts;
- Reduction in environmental related system incidents due to improved data centre environment; and
- Increased reliability of business critical systems particularly in storm or other emergency situations.

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Mobility Infrastructure

Mobility infrastructure is one of the core ICT technology initiatives and consistent with the corporate objectives to leverage technology to optimise business processes and improve labour productivity in a cost effective manner.

The mobility infrastructure program will deliver the technology components of mobile broadband connectivity; mobile devices; mobile device and application management and architectural components for integration to corporate systems. This program will address multiple mobility requirements ranging from office staff requiring remote access to Endeavour's corporate systems to more complex automation of business processes in the field.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">Rapid innovations in mobility solutions have made it difficult to standardise a single approach at Endeavour Energy. Do nothing is not considered to be an option as there is a clear need to provide a single mobility platform in order to benefit from mobility solutions and standards as required by business processes. This option is not considered economically justifiable as the cost of manually processes in the field will continue to increase and exceed the cost of automated field processes as supported by this mobility platform.
Investment in mobile infrastructure and mobile devices	<ul style="list-style-type: none">The future of mobility projects depends upon having a mobility infrastructure in place to enable future mobility solutions to deliver benefits. A standard mobility platform will progressively deliver the technology components to ensure sustainable and re-usable mobility technology to ensure we are able to meet growing infrastructure requirements to support mobility initiatives and allow data to transfer securely and quickly.
Preferred case	<ul style="list-style-type: none">The preferred option is to invest in mobile infrastructure and mobile devices to ensure the full benefits of cost savings and productivity improvements are realised.

The primary costs associated with this program of work assume the purchase of mobile devices and implementation of mobile broadband connectivity and infrastructure to allow Endeavour to take full advantage of the productivity improvements of the field crew.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Mobility Infrastructure program will run for the full five year AER period. It will support a number of initiatives across the organisation where mobilisation of processes have been identified for development and provide the framework and basis for mobility infrastructure and devices.

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Program	Runs in Parallel with:	Supported by:	Supports
Mobility Infrastructure	Field Force Automation		<ul style="list-style-type: none">• Field Force Automation• Workforce Scheduling• Fatigue Management

It is expected that Endeavour Energy will realise an improvement in productivity through the automation of field processes and the mobilisation of field crews with improved connectivity in the field with more current and real time exchange of information. The development of the mobility platform will support future processes where external vendors or contractors will need to such receive and submit data to and from our systems to support business processes. Increased productivity in the field and a connected workforce will translate to improved value for our customers through process efficiency and automation.

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Investment Context

Investment Roadmap

Initiatives included in the ICT Investment Roadmap for 2015-2019 have been selected on the basis that they are clearly linked to the priorities of the business; comply with NER capital guidelines, resource availability for each financial year and to provide benefits directly linked to the strategic objectives of the organisation. The cost is in thousands of dollars (\$'000) and includes total regulated and unregulated investment. (96% of this is attributable to standard control services.)

Networks NSW Category	Program	2015	2016	2017	2018	2019
Risk	Desktop Platform					
Risk	Midrange Architecture					
Risk	Storage Architecture					
Risk	Virtualization Architecture					
Risk	Environmental					
Strategic	Mobility Infrastructure					
Totals						

Prioritisation

The key focus was to find the balance between recurrent expenditure needed to maintain a high level of performance for current systems and functionality and to equip the business with the tools and functionality needed to achieve strategic outcomes for safe, reliable and cost effective supply in a constrained expenditure environment. Only those projects that 'do nothing' was not an option have been included in the investment program. The result of this approach is 90% on technical currency projects to deliver an assured business platform for operating the business and delivering supply. Only improve projects where positive benefits, improved risk mitigation, cost avoidance or cash savings that can be realised within the 4 years have been included in the program.

Leveraging Past Investment

A key investment in the current AER period was the delivery of high availability infrastructure. This has enabled us to implement technologies that automate operations across two data centres and therefore to over time provide the same level of availability at a reduced operational cost. The renewed architecture also drives the reduction in complexity by consolidating technologies and platforms which helps to further contain operating expenditure.

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Prudent Cost Management

The capital constrained environment has required Endeavour Energy to look at capital efficient options to meet the critical needs of the business. The architectural principles that will be applied to achieve the required capital expenditure outcomes are as follows:

- Corporate Endeavour Energy strategy drives IT Architecture;
- Use a common technology infrastructure for deployment;
- Focus on a small set of strategic platforms;
- Re-use what already exists; and
- Assess solutions based on Total Cost of Ownership.

To reduce operating expenditure and improve technology service delivery during the next five years, ICT will secure best quality / best cost application and business support services through market testing as well as exploiting the power of three. In the last year of the current AER period, new outsource contracts will be executed to secure specialist vendors for infrastructure support.

While the reduction in ICT support costs have been recorded as a step change down from current to next period, the benefit to the business will be realised through shorter delivery times and proactive operations management.

Strategic Objective Alignment

The table below links the strategic objectives of ICT to investment initiatives:

IT Strategic Objective	Business Drivers	Investment Initiatives	ICT Program
Simplify the IT Asset landscape	Drive down the costs of delivering projects Drive down the costs of operational support.	Reduce and consolidate computing platforms Replace old and costly hardware with new hardware which is highly scalable, provides high availability at reduced cost.	Midrange Architecture Virtualisation Architecture Storage Architecture.
Reduce operational costs of IT	Drive down the costs of operational support.	Rationalise maintenance contracts and support models associated with IT infrastructure.	Midrange Architecture Virtualisation Architecture Desktop platform Storage Architecture.
Take advantage of technological advancements	Technology innovations and developments Increased reliance on mobile devices and technologies.	Provide an infrastructure framework to support mobility technology Provide unified communications.	Midrange Architecture Virtualisation Architecture Desktop platform Storage Architecture.

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Deliver a scalable, reliable and secure platform for business systems	Business Continuity Manage the operational risk Improve the ability to adapt to changes in the business and industry.	Technical currency - replace IT assets nearing end of life and upgrade assets nearing end of support Capacity management and storage solutions Enhance IT DR capability – business continuity program.	Midrange Architecture Virtualisation Architecture Desktop platform Storage Architecture.
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Benefits

To identify the success of return on investment, a benefits management plan has been established for each initiative. The table below lists the key initiatives with the indicative cost and associated benefits. The cost is in thousands of dollars (\$'000) and includes regulated and unregulated investment.

Program Title	Program Description	Total Cost	Business Benefits
Desktop Platform	Upgrade desktop platform to support operating systems		<ul style="list-style-type: none"> Reduced desktop operating costs due to technical currency of desktop platform Reduction in annual support and maintenance costs Risk Mitigation <ul style="list-style-type: none"> Reduction in failure points and risk of operating system failure due to technical currency of system and maintenance agreements.
Midrange Architecture	Replacement of Unix based mid-range servers with more cost effective, scalable high performance Linux infrastructure		<ul style="list-style-type: none"> Reduced cost of operating mid-range server capability due to old server replacement and rationalisation Reduced licence costs for more efficient hardware Reduction in annual support and maintenance costs Risk Mitigation <ul style="list-style-type: none"> Reduction in failure points and risk of operating system failure due to technical currency of system and maintenance agreements.
Storage Architecture	Replace end of life assets with a virtual storage tiering architecture with automated data management		<ul style="list-style-type: none"> Reduced cost of operating storage due to old server replacement and rationalisation and automation of manual data management activities Reduction in annual support and maintenance costs Risk Mitigation <ul style="list-style-type: none"> Reduction in failure points and risk of data loss due to technical currency of system and maintenance agreements.

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Virtualization Architecture	Replacement/renewal of end of life VMware servers. Consolidation and rationalisation of VMware server platform		<ul style="list-style-type: none"> • Reduced cost of operating mid-range server capability due to old server replacement and rationalisation • Reduced licence costs for more efficient hardware • Reduction in annual support and maintenance costs <p>Risk Mitigation</p> <ul style="list-style-type: none"> • Reduction in failure points and risk of data loss due to technical currency of system and maintenance agreements.
Environmental	Implement data centre environments requirements for cooling, power, fire suppression, redundancy and humidity Implement application monitoring, alerting and licence management tools		<ul style="list-style-type: none"> • Reduction in costs associated with engaging specialist to provide system expertise in the event of poor system performance or failure as monitoring identifies and rectifies faults before they become significant • Reduction in cost of environmental controls <p>Risk Mitigation</p> <ul style="list-style-type: none"> • Reduction in system availability related incidents due to improved monitoring and alerts • Reduction in environmental related system incidents due to improved data centre environment • Increased reliability of business critical systems particularly in storm or other emergency situations.
Mobility Infrastructure	Implementation of mobility infrastructure and devices		<ul style="list-style-type: none"> • Productivity savings through enablement of automated field operations and mobilised field crews.

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IT COMMUNICATIONS ASSET MANAGEMENT AND SERVICES

The Communications Domain defines the roles, policies, standards, and technologies that provide and manage the communications networks Endeavour Energy has a network built with a mix of Cisco routing and switching hardware delivering network connectivity to the Local Area Network (LAN) and Wide Area Network (WAN).

The business applications and services delivered over the LAN/WAN are email, internet and file access, and services unique to a power utility, such as SCADA, which at present are delivered over a separate network but where applicable sharing transport media.

The IT network is configured with a working level of redundancy and performance capabilities that meets operational needs and business risk requirements for the organisation. Currently, Endeavour Energy's data network carries voice and video traffic although it was originally designed for data only. Voice and video traffic are more demanding and require better performing networks and quality of service (QOS) to be seamlessly usable. This can have serious repercussions on the performance of any number of applications and technologies and impacts are felt by the business in reduced computer response times.

The Wide Area Network (WAN) provides communication links for voice and data between Endeavour offices. The existing WAN routers were installed in 2005 and are nearing end of life. A scheduled project for 2014 will refresh the WAN routers to provide for future bandwidth and quality of service requirements.

A Wireless LAN is installed at Endeavour's head office at Huntingwood and three of its depots but coverage is limited to nominated areas only. A scheduled project for 2014 to upgrade the Wireless LAN is planned to extend the wireless LAN to all of Endeavour's depots.

The current voice PABX platforms are now end of life and require replacement with the industry standard IP based telephony.

The current technology is unlikely to support business needs for increased data flows required by field force automation and increased used of outsourced vendors for field based asset management services cost effectively.

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Business Drivers for Technology Investment

The key business drivers for Communications Infrastructure are to provide an Assured Business Operations while also driving customer value through reducing ICT costs. Providing a fast and reliable communications network is crucial to supporting Endeavour Energy's increasingly mobile workforce.

- Drive down the costs of operational support by reducing the cost delivery of voice and data services. Consolidation of the voice and data network to a single supported IP network to provide future integration capabilities and improved reliability of voice and data services across Endeavour Energy;
- Address increased reliance on mobile devices by delivering mobile communication and process automation solutions to field workers that will enable them to more safely, efficiently and accurately perform their work in line with the Network Supply Strategy;
- Take advantage of technology innovations and developments in the IT marketplace to capitalise on collaborative technologies to provide, voice messaging, instant messaging, calendar, email, audio, video, and Web conferencing on a single user platform;
- Support business continuity by transitioning from a Retail Call Centre to a Network Contact Centre. Provide detailed outage information to customers during an emergency event, avoiding the need to increase agent staffing levels to deal with the incoming calls;
- Manage the operational risk of a communications failure by the replacement/renewal of currently installed equipment which will be past or at the end of its economic life at the time of replacement; and
- Improve the ability to adapt to change and support the demand for flexibility and interoperability by operating in a shared services environment across NNSW.

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Target Environment

Investment in communications technology is required to provide the business with connectivity to allow business operations for field services and communication to data centres and staff located in office areas. There are five programs of work supporting this requirement as follows:

- Replacement of life expired WAN infrastructure;
- Replacement of life expired Telephony infrastructure;
- Enterprise Wireless Coverage;
- Demand for Collaborative Technologies; and
- Network Contact Centre.

The first three programs will deliver a technically current communication infrastructure to mitigate business risk as well as provide new functionality to meet business needs and reduce ICT support costs. Programs 4 and 5 provide the infrastructure required to support data quality and cost efficiency projects required to deliver the Network Supply Strategy. The programs are outlined below.

Replacement of life expired WAN infrastructure

This program of work is required to mitigate the risk of Communications failure. Installed equipment which is at the end of its economic life will be replaced. This project will enhance WAN functionality to support the next generation voice network that will be carried over the IP protocol. This will require a quality of service function to be added to the network that can prioritise interactive real time applications such as voice over data oriented applications. This will deliver to the business benefits of a stable and reliable infrastructure platform.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">• There is an increased risk for Endeavour as the WAN equipment approaches End-Of-Life status. In the event of failure the vendor will not be able to adequately support the equipment while leaving Endeavour's WAN connectivity non-functional. This option is not economically justifiable as without an investment in current technology, maintenance costs will continue to increase and there are potential revenue losses in the event of communications incident due to an unreliable platform.
Buy / Build	<ul style="list-style-type: none">• Purchase and configuration of WAN infrastructure to ensure ICT can support business continuity with limited customer disruptions and ensure business has the continuing confidence of a reliable data network.
Preferred case	<ul style="list-style-type: none">• Buy / Build - following quotes obtained from the market, the least costly option will result in reduced operating expenditure from 2014/15 upon execution of new management contract.

The primary costs associated with this program include the purchase of hardware, i.e. WAN equipment and the WAN design and implementation, the costs for which have been estimated on the basis of historical purchases for medium and large WAN components using forecasted

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volumes required. Configuration and implementation costs have been estimated using a standard model used for all projects within the submission document.

Operating expenditure is expected to reduce due to a new management contract commencing in the 2014/15 financial year. This contract will also see the consolidation of disparate communications systems into one easy to manage platform providing stability through technical currency of the infrastructure.

Replacement of life expired Telephony infrastructure

This program of work will aim to consolidate the voice and data network to a single supported IP network to provide future integration capabilities and improved reliability of voice and data services across Endeavour Energy. The upgrade will involve a significant shift to the industry standard of IP telephony. This will allow a more productive workforce that can leverage the capability of unified communications and collaboration. Telephone calls can be directed to whatever device the user has access to and the costs of mobile telephony calls can be reduced by using wireless local data networks when users are in range of Endeavour Energy sites.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">The current infrastructure is beyond End-Of-Life and cannot be further supported by the original vendor. The platform requires an immediate capital investment to reduce risk of platform failure and improve reliability of the system. Without an investment, maintenance costs will continue to increase and revenue could be lost due to an unreliable platform. This option is not economically justifiable due to the missed opportunity of realising cost savings through current technology. The cost savings are targeted at implementing systems to reduce costs of mobile telephony and wireless data.
On-board with existing AusGrid infrastructure and services	<ul style="list-style-type: none">Comparison of quotes obtained from the market, this option was identified to be a more costly solution to implement.
Buy / Build	<ul style="list-style-type: none">Purchase and configuration of a new software-based telephony system. To deliver a stable business telephony platform to ensure minimal disruption to our customers and ensure business has the continuing confidence of a reliable technology platform.
Preferred case	<ul style="list-style-type: none">Buy / Build - following quotes obtained from the market and after assessment against Ausgrid option it was found to be the least costly option and will result in reduced operating expenditure from 2014/15 upon execution of new management contract.

The primary costs associated with this program of work assume the purchase of a new software-based telephony system and cost of system integrator consultancy services to configure and integrate the new telephony solution. Costs for this program have been received through procurement activities within the market. The costs of software licences have been determined and multiplied by the number of units required to arrive at the program estimate. Hardware licences have been estimated on the average cost of telephony handsets and multiplied by the

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number of required units. Implementation costs have been estimated using the standard estimation model applied to all projects within the submission.

Operating costs are expected to reduce from 2014/15 upon execution of a new management contract. Additional benefits include a reduction in complexity and management costs through the elimination of some communication systems and devices and a stable platform provided through technical currency.

Enterprise Wireless Coverage

This program of work will aim to provide mobile communication and process automation solutions to field workers that will enable them to more safely, efficiently and accurately perform their work in line with the Network Supply Strategy. Provide full wireless coverage at depots and offices to enable mobile workers to roam while remaining connected to Endeavour computing facilities to reduce the reliance on a static computer workstation. A pilot project has shown that a connected workforce to be more productive.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">The do nothing option will not be pursued as it would keep existing bottlenecks / black spots that inhibit business productivity-driven initiatives such as the investment in mobility. This option is not economically justifiable due to the missed opportunity of realising cost savings through automation of business process. The cost savings are targeted at implementing technology to enable mobile employees to assess, modify and relay information to corporate systems from mobile devices and workstations.
Buy / Build	<ul style="list-style-type: none">Purchase and configuration of a new wireless LAN system. The investment will ensure a reliable wireless platform for the future and support the business objectives and strategic context of Field Force Automation.
Preferred case	<ul style="list-style-type: none">Buy / Build will enable Endeavour Energy to improve efficiencies and improve data quality through provision of mobility solutions to capture data in the field in line with strategic objectives of Deliver the Network Plan.

The primary costs associated with this program of work involve the equipment that allows for the completion of wireless coverage at depots and offices. Hardware costs are based on current market cost information, which have been calculated using vendor list prices for hardware components. Implementation costs have been estimated using a standard model applied to all projects within the submission. It is expected that as this is new technology that an increase to operating costs will be realised from 2014/15 upon completion of the project.

The table below outlines related programs and how these initiatives support or are supported by programs in other areas of the ICT Investment Plan. The Enterprise wireless coverage program will commence in the first year of the AER and be well positioned to support the development of the Field Force automation program and Mobility Infrastructure program.

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Program	Runs in Parallel with:	Supported by:	Supports
Enterprise Wireless coverage			<ul style="list-style-type: none"> Field Force Automation Mobility Infrastructure

Endeavour Energy will benefit from this investment through enablement of improved efficiency and data quality through mobile workers capturing data in the field.

Demand for Collaborative Technologies

The investment in LAN and WAN will create opportunities to leverage collaborative technologies to reduce costs by providing, voice messaging, instant messaging, calendar, email, audio, video, and Web conferencing on a single user platform.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Do nothing is not considered as operating in the Networks NSW framework will require high levels of collaboration and communication between the operating companies and NNSW. Leveraging collaborative technologies is the best option to contain the (operational) costs associated with this level of co-operation. This option is not economically justifiable due to the missed opportunity of realising cost savings in communication through leveraging off collaborative technology.
Buy / Build	<ul style="list-style-type: none"> Purchase and configuration of new collaborative software-based technologies to support Endeavour Energy and NNSW, business transformation and restructure and provide a technology that delivers future business benefits with reduced operational costs.
Preferred case	<ul style="list-style-type: none"> Buy/Build By offering collaborative technologies, the business will work smarter through more agile and cost-effective access to technology and information. A unified platform of Voice, Data and applications will reduce costs and boost productivity across the business.

The primary costs associated with this program of work are involved with implementation of software and services that build on the telephony platform in the context of unified communications. Hardware and software costs have been estimated using budgetary estimates received from the market. Implementation costs have been estimated using a standard estimation model used for all projects within the submission.

Operating expenditure is not expected to be materially impacted through implementation of this project. Expected benefits include:

- Increased productivity and teamwork through the use of common feature sets and user operation and

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- Access to in-house communication facilities for all enterprise members, increasing employee collaboration and reducing costs as compared with outsourced services.

Network Contact Centre

The Contact Centre Replacement Project programme is necessary to ensure the business has a reliable contact centre platform that can receive and respond to not only day to day Network calls but also emergency situations.

Endeavour Energy currently operates two Nortel Meridian PABX and Symposium systems at each of its Contact Centre locations (Huntingwood and Coniston). Both of these systems were installed in 2000 and are now at the end of their useful life. Any Contact Centre infrastructure upgrade was deferred until after the Integral/Origin Retail Separation. Since that time, retail calls have been phased out and the remaining network calls have reduced. The contact centre has been down sized and the number of agents reduced.

The economic justification for this investment is to ensure that Endeavour is able to meet its obligation as DNSP and provide customer contact functionality during normal business hours, avalanche event and during emergency calls. This program of work will replace the current End of Life Contact Centre environment that will be configured to meet Endeavour Energy's changed needs as a Network only business.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">• Do nothing is not considered a viable option as the current platform is based on a combined retail / distribution business model and therefore will incur the highest operating costs. The current infrastructure is beyond End-Of-Life and cannot be further supported by the original vendor. In addition to placing at risk Endeavour's ability to fulfil its obligations as DNSP, this option is not economically justifiable due to the high operating costs associated with the combined retail/distribution business model.
Shared infrastructure and services for Networks NSW	<ul style="list-style-type: none">• Comparison of quotes obtained from the market, this was identified to be a more costly solution to implement and to support ongoing.
Buy / Build	<ul style="list-style-type: none">• Purchase and configuration of a new software-based Contact Centre system. Deliver a stable business Contact Centre platform to ensure minimal disruption to our customers and ensure the Contact Centre business has the continuing confidence of a reliable platform.
Preferred case	<ul style="list-style-type: none">• Purchase of a new software-based Contact Centre system is the preferred option as this represents the more efficient option for both capital and ongoing operating expenditure.

The primary costs associated with this program of work include the purchase of a new contact centre platform. Hardware and software costs have been estimated based on budgetary estimates received from the market. Implementation costs have been estimated using a standard estimation model applied to all projects within the submission. Operating expenditure is

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not expected to be materially impacted through implementation of this project. Cost efficiencies will be realised through combining support with the IP Telephony solution.

Investment Context

Investment Roadmap

Initiatives included in the ICT Investment Roadmap for 2015-2019 have been selected on the basis that they are clearly linked to the priorities of the business; comply with NER capital guidelines, resource availability for each financial year and to provide benefits directly linked to the strategic objectives of the organisation. The cost is in thousands of dollars (\$'000) and includes total regulated and unregulated investment. (96% of this is attributable to standard control services.)

Networks NSW Category	Program	2015	2016	2017	2018	2019
Risk	WAN Replacement					
Risk	Telephony Infrastructure					
Risk	Enterprise Wireless Coverage					
Risk	Collaborative Technologies					
Risk	Network Contact Centre					
Totals						

Prioritisation

The key focus was to find the balance between recurrent expenditure needed to maintain a high level of performance for current systems and functionality and to equip the business with the tools and functionality needed to achieve strategic outcomes for safe, reliable and cost effective supply in a constrained expenditure environment. Only those projects that 'do nothing' was not an option have been included in the investment program. The result of this approach is 86% on technical currency projects to deliver an assured business platform for operating the business and delivering supply. Only improve projects where positive benefits, improved risk mitigation, cost avoidance or cash savings that can be realised within the 4 years have been included in the program.

Leveraging Past Investment

A key investment in the current AER period was the delivery of high availability infrastructure. This has enabled us to implement technologies that automate operations across two data centres and therefore to over time provide the same level of availability at a reduced operational cost. The renewed architecture also drives the reduction in complexity by consolidating technologies and platforms which helps to further contain operating expenditure.

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Prudent Cost Management

The capital constrained environment has required Endeavour Energy to look at capital efficient options to meet the critical needs of the business. The architectural principles that will be applied to achieve the required capital expenditure outcomes are as follows:

- Corporate Endeavour Energy strategy drives IT Architecture;
- Use a common technology infrastructure for deployment;
- Focus on a small set of strategic platforms;
- Re-use what already exists; and
- Assess solutions based on Total Cost of Ownership.

To reduce operating expenditure and improve technology service delivery during the next five years, ICT will secure best quality / best cost application and business support services through market testing as well as exploiting the power of three. In the last year of the current AER period, new outsource contracts will be put in place for provision and support of telecommunications services. These new contracts will result in operating expenditure savings for the organisation.

While the reduction in ICT support costs have been recorded as a step change down from current to next period, the benefit to the business will be realised through shorter delivery times, proactive operation management and more timely resolution of incidents.

Strategic Objective Alignment

Investment in IT communications will be targeted to facilitate the achievement of the following ICT strategic objectives:

- Deliver a scalable, reliable and secure platform for business systems and
- Take advantage of technological advancements

IT Strategic Objective	Business Drivers	Investment Initiatives	ICT Program
Deliver a scalable, reliable and secure platform for business systems	<ul style="list-style-type: none">• Business continuity• Manage operational risk• Improve the ability to adapt to changes	<ul style="list-style-type: none">• Upgrade the WAN to support the next generation voice network that will be carried over the IP protocol.• Upgrade IP telephony to the industry standard. This will allow a more productive workforce that can leverage the capability of unified communications and collaboration.• Provide full wireless coverage at depots and offices to enable mobile workers to roam while remaining connected to Endeavour computing facilities.• Establish a network only contact centre platform replacing end of life systems.	<ul style="list-style-type: none">• WAN Infrastructure replacement• Telephony Infrastructure Replacement• Enterprise Wireless Coverage• Network Contact Centre

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Take advantage of technological advancements

- Technology innovations and developments
- Increased reliance on mobile devices

- Provide, voice messaging, instant messaging, calendar, email, audio, video, and Web conferencing on a single user platform

- Collaborative Technologies

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Benefits

To identify the success of return on investment, a benefits management plan has been established for each initiative. The table below lists the key initiatives with the indicative cost and associated benefits. The cost is in thousands of dollars (\$'000) and includes regulated and unregulated investment.

Program Title	Program Description	Total Cost	Business Benefits
WAN Infrastructure	Replacement of life expired infrastructure. This program delivers the replacement/renewal of currently installed equipment which will be past or at the end of its economic life at the time of replacement.		<ul style="list-style-type: none"> Enhance business capability Disparate communications systems are consolidated into one easy to manage platform, reducing operating expenses. Risk Mitigation <ul style="list-style-type: none"> Provide technical currency and improvements through a stable infrastructure platform.
Telephony Infrastructure	Implementation of IP based telephony. IP Telephony is a critical building block for the Communication Technology Roadmap. IP Telephony enables the use of Endeavour's data network for the transport of voice, replacing the use of traditional telephone networks and equipment.		Improve business capability <ul style="list-style-type: none"> A number of communications systems and devices can be eliminated reducing complexity and cost of management and operation Risk Mitigation Provide technical currency and improvements through a current and stable infrastructure platform.
Enterprise Wireless Coverage	Implementation of full coverage Wireless LAN. This program upgrades and extends the WLAN capability across all depots, thereby providing increased flexibility in network connectivity for the mobile workforce that frequent the depots.		<ul style="list-style-type: none"> Enhance business capability Improved efficiency of mobile works when working in the field at any location resulting in operational efficiencies and improved productivity and labour costs.
Collaborative Technologies	Unified communications applications. The introduction of Unified Communications will create an unparalleled opportunity to capitalise on collaborative technologies		<ul style="list-style-type: none"> Common feature set and user operation, increases productivity and teamwork while minimizing training costs. All enterprise members have access to in-house communication facilities, increasing employee collaboration and cost savings as compared with outsourced services.
Network Contact Centre	Replacement of end of life contact centre environment		<ul style="list-style-type: none"> Cost efficiencies from the implementation of up to date equipment and new support contracts.

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ICT OPERATIONAL SERVICES

The provision of a reliable, available and secure business platform is the primary goal of ICT operational services. The IT Service Delivery function within Endeavour Energy is delivered by an outsourced service provider and managed by an internal Operations team. Endeavour has adopted the ITIL (IT Infrastructure Library) framework of best practice guidance for IT Service Management and has effectively aligned IT services to the needs of the business and core business processes.

The focus on lower ICT support costs through rationalisation of software, hardware and support service levels has enabled significant cost reductions in the current AER period. Further investment in technology is needed to deliver the increased service levels required by the business as more users, more devices access computer systems and networks cost effectively.

Endeavour Energy's ability to effectively forward plan and meet its compliance, capacity and performance objectives in a timely and structured manner is currently hampered by the lack of automated monitoring tools and information stores. These stores are needed to provide reliable metrics, leading and lagging indicators of performance and are most evident in the following Service Delivery areas;

- License Compliance
- Release Management
- Lifecycle Management
- Disaster Recovery Testing
- System Health

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Business Drivers for Technology Investment

The key business drivers for ICT Operational Services are to reduce the cost of IT services while providing flexibility and transparency of IT services to achieve best practice results.

The increasing need to achieve better IT operational outcomes is driving the necessity for investment in systems and processes to:

- Manage operational and business risk through the provision of an assured business platform by proactively managing End of Life systems;
- Lower the cost of IT support costs through improved tool sets;
- Licence repository to provide more effective licence management and purchasing decisions;
- Configuration repository (single source of truth) to provide operational efficiencies through more accurate data in a single database;
- Lifecycle repository to track the age and revision of operating environments in a proactive manner and provide operational cost benefit through more efficient use of ICT infrastructure;
- Lower the ICT costs to provision disaster recovery and business continuity environments; and
- Lower ICT costs through flexible sourcing models.

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Target Environment

An investment in management tools and systems to increase visibility of the IT environment is required. The tools would equip Endeavour Energy with a framework to provide proactive services to meet performance and capacity objectives, and ultimately better service to our customers. These tools would be used to drive further cost efficiencies and reduce “spare” capacity, delay the capital investment in storage and computing power and enable greater transparency of service quality. A modern and well equipped management system provides greater visibility and leads to accountability by service providers.

Investment in IT operational services will be targeted to facilitate the achievement of the following ICT strategic objectives:

- Deliver a scalable, reliable and secure platform for business systems and
- Reduce operational costs of IT.

This will be delivered through two programs of work:

- Operations Risk Improvement Program and
- Business Continuity Enhancement Program.

IT Strategic Objective	Business Drivers	Investment Initiatives	ICT Program
Deliver a scalable, reliable and secure platform for business systems.	Manage operational risk Improve the ability to adapt to changes.	<ul style="list-style-type: none"> • Provide a repository of information related to all components of Endeavour's information systems (CMDB). • Provide the ability to manage the lifecycle process and give IT Operations full visibility of operating environments. • A license compliance toolset will allow Endeavour Energy to report quickly on utilisation and also allow the harvesting of licenses. • To provide proactive problem detection by using enterprise monitoring tools to deliver better service levels to business users and ultimately customers. 	<ul style="list-style-type: none"> • Operations Risk Improvement Program.
Reduce operational costs of IT.	Drive down the costs of operational support.	<ul style="list-style-type: none"> • Implement configuration management database to assess performance expectations and monitor and assess vendor service delivery. 	<ul style="list-style-type: none"> • Operations Risk Improvement Program.

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		<ul style="list-style-type: none"> Lifecycle management tool to manage licences, technical currency and retirement. 	
Deliver a scalable, reliable and secure platform for business systems.	Business continuity.	<ul style="list-style-type: none"> Provide a cost effective means to delivery risk mitigation to the business and contribute directly to maintenance of low network tariff rates and sustainable reliability. 	<ul style="list-style-type: none"> Business Continuity Enhancement Program.

For each project, the market will be tested for an off the shelf product and will include a review of the tools used by Ausgrid and Essential to achieve best value /best fit solution for Endeavour.

Operations Risk Improvement Program

This program will focus on a configuration management database, lifecycle management and licence management tools and an enterprise monitoring tool.

1. CMDB Project

This program aims to create a CMDB as a single source of truth for configuration items. This is crucial given the move to multi source vendor arrangement to ensure business operations and users receive seamless service and timely return to service. This will also provide a means for Endeavour to assess quality of service delivered by vendors.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> The current process for managing configuration is highly manual and resource intensive. Information is contained in multiple databases and there is a heavy reliance on service providers to provide knowledge. The current option of “do nothing” is not economically justifiable due to the high operating costs associated with longer outages and longer return to service experienced due to the reactive nature of information collection and presentation.
Purchase CMDB software	<ul style="list-style-type: none"> Acquisition and implementation of CMDB software to support prioritisation of return to service.
Preferred case	<ul style="list-style-type: none"> Purchase CMDB software

The primary costs associated with this program of work assume the purchase of a COTS solution, software costs are estimates only, based on similar types of applications within the market. Configuration, integration and implementation costs have been estimated using a standard estimation model applied to all projects within this submission.

There will be an increase in operating expenditure associated with this new solution for third party support and maintenance; however this solution is expected to provide operational efficiencies within ICT brought about through better more accurate data in a single repository.

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2. Asset Lifecycle Management Tool

Provide the ability to manage asset lifecycle for all environments including development and test. Currently there are no supporting tools in place to manage the on-going provisioning and retirement of systems. This creates a poor investment model as environments are often left to consume capacity and performance even though they may no longer be required.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">The current process of asset lifecycle management is highly manual and resource intensive. Incorrect analysis of information leads to continued support costs for already retired assets or slow identification of aging assets. This option is not economically justifiable as the cost of manually managing the asset lifecycle will continue to increase and exceed the cost of implementing current software to proactively manage assets. The associated costs and problems from aging assets not identified, contributes to the high operating costs of these assets.
Purchase asset lifecycle management tool	<ul style="list-style-type: none">Acquisition and implementation of asset lifecycle software to proactively manage assets from provisioning to retirement.
Preferred case	<ul style="list-style-type: none">Purchase asset lifecycle management tool

The primary costs associated with this program of work assume the purchase of new software, the cost of which has been estimated using knowledge and experience on previously purchased systems. Configuration and implementation costs have been estimated using a standard estimation model used for all projects within the submission.

There is expected to be a minor increase in operating expenditure for third party support and maintenance costs associated with a new application, however operational efficiencies will be gained through better planning, procurement, monitoring, support and disposal of systems through the lifecycle process. Additional benefits include:

- Provide technical currency and improvements through better management of resources and
- Environments can be identified earlier for replacement and can be decommissioned as soon as they are End of Life.

3. License Management

A license compliance toolset will allow Endeavour Energy to report quickly on utilisation and also allow the harvesting of licenses, understand what is in use and what can be recovered which ultimately provides a cost benefit as well as regulatory compliance. A License management system is required to maintain an efficient use of software licensing in the environment.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">The current process of license management is highly manual and relies heavily on vendor information. Endeavour is at risk of breaching licenses without a full license management system and in some cases being over licensed and paying additional support fees. This option is not economically justifiable in the event of a license breach or regulatory breach, Endeavour Energy would be required to pay penalties and incur compliance expenses.
Purchase Licence Management software	<ul style="list-style-type: none">Acquisition and implementation of a license management software.
Preferred case	<ul style="list-style-type: none">Purchase Licence Management software

The primary costs associated with this program of work assume the purchase of a COTS licence management solution, the costs for which have been estimated on current market value. Configuration, integration and implementation costs have been estimated using a standard estimation model applied to all projects within the submission.

A small increase to operating expenditure is expected through third party support and maintenance costs associated with a new application. This has been factored into a growth estimate within the operating expenditure forecast. Benefits of this program include:

- Improved licence management and purchasing decisions and
- Compliance with 3rd party software licence agreements.

4. Enterprise Monitoring Tool

This tool will aim to fill gaps in our current end to end operations management processes by allowing Endeavour to understand the user experience from the data centre to the desktop and identify bottlenecks across any given service. A service typically uses a multitude of devices and application interfaces. The enterprise tools will provide Endeavour with a stronger understanding of what needs to be fixed in a methodical manner. This will aim to reduce outage times for business users and allow measurement of vendor performance in a multi sourced operations delivery model.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">System performance monitoring is a highly manual process and often delays reaction and repair times. The current option of "do nothing" is not economically justifiable due to the high operating costs associated with longer outages and longer return to service experienced due to the reactive nature of information collection and presentation.
Purchase of Enterprise Monitoring Tool	<ul style="list-style-type: none">Acquisition and implementation of an enterprise monitoring tool to manage and measure system performance.

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Preferred case	<ul style="list-style-type: none">• Purchase of COTS Enterprise Monitoring Tool
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The primary costs associated with this program of work assume the purchase of an enterprise monitoring tool that will be implemented with the data centre program of work. Software costs have been estimated using knowledge and experience based on previously purchased monitoring solutions.

Benefits of this investment include improvement in overall system performance and efficiency improvements for end users through targeted upgrades and remediation activities for performance improvements.

Business Continuity Enhancement Program

The Business Continuity strategy requires IT to deliver a return to service for critical processes to mitigate the risk of well-defined hazardous events. Endeavour's current strategy is to support multiple disaster scenarios; therefore a resilient and scalable architecture must be implemented to support partial and complete failovers seamlessly and with minimal technical requirement to invoke. This program will focus on IT systems continuity and implement a fit for purpose architecture that can withstand multiple DR events with limited technical resource requirements.

Endeavour Energy will implement a fit for purpose architecture that can withstand multiple DR events with limited technical resource requirements. This practice is otherwise known as a high availability architecture that spans across two or more data centres to provide end to end business continuity. This presents a cost effective means to delivery risk mitigation to the business and contributes directly to maintenance of low network tariff rates and sustainable reliability.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">• The current process of managing business continuity and DR is highly manual and resource intensive. This option is not economically justifiable due to the missed opportunity of realising cost savings through automation of this process. The cost savings are targeted at implementing high availability to replace the manual plans.
Configuration of DR and BCP on new infrastructure	<ul style="list-style-type: none">• Implement new infrastructure and configure DR and BCP towards high availability across two data centres. Automation of BCP to replace manual plans.
Preferred case	<ul style="list-style-type: none">• Configuration of DR and BCP on new infrastructure

The primary costs associated with this program of work assume that all work will be conducted post data centre refresh which is geared towards highly available infrastructure and hence the costs would mainly involve the engagement of contractors for design and configuration services for Disaster Recovery purposes. No additional hardware will be purchased under this program of work and a small allowance has been made for software purchase for automated DR cutover for specialist technologies. These costs have been based on knowledge gained from the market.

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Implementation and configuration costs have been estimated using a standard estimation model applied to all projects within the submission.

The expected benefits of this investment include:

- Elimination of disaster recovery manual plans will provide a more efficient and highly available operating environment, reducing the effort and cost of Business Continuity exercises;
- Risk Mitigation and management of interruptions of IT services;
- High availability across the enterprise to be delivered in a more automated way;
- Support Network Supply with confidence of business continuity program; and
- Increased reliability of business critical systems particularly in storm or other emergency situations.

Operations Technical Currency Program

The operations technical currency program includes the upgrade of applications used in IT to manage architectural frameworks and project management. Endeavour Energy will upgrade these applications to current versions to ensure compatibility and sustainability of these applications within the IT Service Delivery and operations.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">• If Endeavour maintains the current versions of these applications the risk of incompatibility with computing platforms and other technology components is increased. This option is not economically justifiable as the cost of supporting out dated technology will continue to increase and exceed the cost of implementing current and supportable technology.
Technical upgrade	<ul style="list-style-type: none">• The upgrade of applications to the current version supported by vendor.
Preferred case	<ul style="list-style-type: none">• Technical upgrade of applications.

The primary cost associated with this program of work assumes some costs for configuration and migration of existing data. No new licenses will be required as the application will continue to be supported by existing maintenance and support.

The expected benefits of this investment include:

- Reduced risk of the applications becoming out of support and associated cost increases and
- Maintain interoperability with computing platforms and technological components.

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Operations Program

The operations program includes planning for small projects up to \$50k. These small projects are for planned and unplanned initiatives to support auditing requirements, license compliance, regulatory and mandatory requirements or small equipment purchases on an annual basis.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none"> Funding is allocated each year for small projects that are not part of larger program of work, the initiatives are required to meet regulatory or mandatory requirements and enhancements and also cover smaller equipment or license purchases.
Implement projects	<ul style="list-style-type: none"> Each small project will be assessed on its own merits and within criteria for small projects.
Preferred case	<ul style="list-style-type: none"> Implementation of projects that meet required criteria.

The primary costs associated with this program of work assume that usually configuration, licensing, and additional functionality to meet regulatory or mandatory requirements. The expected benefit of this investment includes meeting the requirements of audits and regulations to maintain the appropriate level of compliance with regulations and governance.

Investment Roadmap

Initiatives included in the ICT Investment Roadmap for 2015-2019 have been selected on the basis that they are clearly linked to the priorities of the business; comply with NER capital guidelines, resource availability for each financial year and to provide benefits directly linked to the strategic objectives of the organisation. The cost is in thousands of dollars (\$'000) and includes total regulated and unregulated investment. (96% of this is attributable to standard control services.)

Networks NSW Category	Program	2015	2016	2017	2018	2019
Risk	Operations Risk Improvement Program					
Risk	Business Continuity Enhancement Program					
Risk	Operations Technical Currency Program					
Risk	Operations Program					
Totals						

Prioritisation

The key focus was to find the balance between recurrent expenditure needed to maintain a high level of performance for current systems and functionality and to equip the business with the tools and functionality needed to achieve strategic outcomes for safe, reliable and cost effective supply in a constrained expenditure environment. Only those projects that “do nothing” was not

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an option have been included in the investment program. The result of this approach is 15% on technical currency projects to deliver an assured business platform for operating the business and delivering supply. Only improve projects where positive benefits, improved risk mitigation, cost avoidance or cash savings that can be realised within the 4 years have been included in the program.

Leveraging Past Investment

Endeavour has continued to invest in technical upgrades for its ICT applications to mitigate risk to business operations and to leverage functionality enhancements delivered with software releases. This investment approach has allowed Endeavour Energy to continue to develop and enhance these systems to achieve business productivity, improved data quality and reliability as well as improved compliance capabilities in a capital efficient manner.

Prudent Cost Management

The capital constrained environment has required Endeavour Energy to look at capital efficient options to meet the critical needs of the business. The architectural principles that will be applied to achieve the required capital expenditure outcomes are as follows:

- Corporate Endeavour Energy strategy drives IT Architecture;
- Use a common technology infrastructure for deployment;
- Focus on a small set of strategic platforms;
- Re-use what already exists; and
- Assess solutions based on Total Cost of Ownership.

To reduce operating expenditure and improve technology service delivery during the next five years, ICT will secure best quality / best cost application and business support services through market testing as well as exploiting the power of three. In the last year of the current AER period, new outsource contracts were executed to secure specialist vendors for the:

- Development and support of the Outage Management System and GIS;
- Development and support of the corporate integration platform and
- Support of the HRMS and ERP system.

While the reduction in ICT support costs have been recorded as a step change down from current to next period, the benefit to the business will be realised through shorter delivery times, proactive operations management and more timely resolution of incidents.

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Benefits

To identify the success of return on investment, a benefits management plan has been established for each initiative. The benefits of these two programs of work are detailed below;

- Operational Efficiency - Operational efficiency will be achieved through better capacity and performance management of IT systems, ensuring that the end user experience is satisfactory. Efficiency will also be achieved through more effective change control by understanding risks associated with outages, and which user communities and services they will affect and
- Cost Reduction - Potential cost reduction will be achieved through better planning using IT metrics as the baseline with which we plan further investment. This allows IT to make sound decisions and act more strategically when decisions need to be made around licensing compliance, performance and capacity upgrades in particular.

The cost is in thousands of dollars (\$'000) and includes regulated and unregulated investment.

Program	Project Title	Project Description	Total Cost	Business Benefits
Operations Risk Improvement Program	CMDB	<ul style="list-style-type: none"> • The CMDB or Configuration Management Database is a repository of information relating to every component in an information system. The CMDB is fundamental to the ITIL framework, which is the leading framework in the IT industry for the end to end management of IT services. 		Enhance Business Capability <ul style="list-style-type: none"> • Reduction in costs through operational efficiencies brought about through better, more accurate data in a single repository.
Operations Risk Improvement Program	License Management	<ul style="list-style-type: none"> • License compliance is a legal requirement that Endeavour must abide by. Strong penalties can be legally imposed through non-compliance, presenting both a financial and reputational risk to the organisation. Management tools will allow Endeavour to maintain its legal obligations and also plan for further purchases and consolidation opportunities. 		Enhance Business Capability <ul style="list-style-type: none"> • Improved tools for licence record keeping will provide more effective licence management and purchasing decisions. Risk Mitigation <ul style="list-style-type: none"> • Compliance with 3rd party software licence agreements.

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Operations Risk Improvement Program	Lifecycle Management	<ul style="list-style-type: none"> Lifecycle management allows Endeavour to utilise system resources for a limited time, and then terminate them automatically as required. This presents an efficiency benefit by allowing Endeavour to recover performance and capacity that is unused across the enterprise with minimal human interaction. 		Risk Mitigation <ul style="list-style-type: none"> Provide technical currency and improvements through better management of resources. Environments can be identified earlier for replacement and can be decommissioned as soon as they are end of life.
Operations Risk Improvement Program	Enterprise Performance Monitoring	<ul style="list-style-type: none"> Enterprise performance monitoring allows Endeavour to understand the user experience in an end to end service and identify bottlenecks across any given service. A service typically uses a multitude of devices and application interfaces. The enterprise tools will provide Endeavour with stronger understanding of what needs to be fixed in a methodical manner. 		Enhance Business Capability <ul style="list-style-type: none"> Improving overall system performance and efficiency, as well as allowing planning for targeted upgrades to improve performance for end users resulting in improved efficiencies of operation.
Business Continuity Enhancement Program	Business Continuity Enhancements	<ul style="list-style-type: none"> Develop highly available architectures that support Business Continuity Implement an automated fail-over system Automation enhancements to automatically enter DR states as needed without IT resources. Enhancements to core DR architecture. 		Enhance Business Capability <ul style="list-style-type: none"> Elimination of disaster recovery manual plans will provide a more efficient and highly available operating environment, reducing the effort and cost of Business Continuity exercises. Risk Mitigation High availability across the enterprise to be delivered in a more automated way. Risk Mitigation Increased reliability of business critical systems particularly in storm or other emergency situations.
Operations Technical Currency Program	iServer Upgrade Primavera Upgrade	<ul style="list-style-type: none"> The upgrade of applications used in IT Service Delivery to manage architectural frameworks and program delivery. 		Risk Mitigation <ul style="list-style-type: none"> Maintain BAU at required performance level and maintain supportability with product vendors.
Operations Program	Initiatives less than \$50k	<ul style="list-style-type: none"> The implementation of small projects and initiatives to meet new and planned regulatory and compliance initiatives. 		Risk Mitigation <ul style="list-style-type: none"> Compliance to regulatory and audit requirements.

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INFORMATION SECURITY

Endeavour Energy aims to provide employees, customers, contractors and consumers with the right information through appropriate security controls, in the office, the field and at home.

The increased reliance on mobile technologies and the recognition that persons conducting business (PCBUs) on behalf of Endeavour Energy as well as customer and suppliers, require access to information currently stored on our internal applications, databases and servers. The need to open this information up to achieve business efficiencies and the information needs of all parties has a significant impact on Endeavour Energy's security architecture.

The security domain delivers information confidentiality, integrity and availability of the platform whilst providing an assured business platform.

The core processes covered under this program are:

- Security Architecture;
- Vulnerability and Threat Management; and
- Identity and access management.

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Business Drivers for Technology Investment

The key business drivers for ICT security are to manage the operational risk involved in allowing external and remote access to Endeavour Energy business information. Endeavour Energy needs to be on top of modern IT security advancements in intrusion prevention and detection, event monitoring and threat and vulnerability assessment whilst supporting the business to adapt to changes in the industry and marketplace particularly with regards to data and the integration of IT and OT.

Providing secure architectures and networks is crucial to supporting Endeavour Energy's increasingly mobile and third party based workforce and is driving the necessity for investment in systems and processes to:

- Support business continuity by developing overarching security architecture and providing architectural guidance and approvals for individual projects in the ICT programs of work;
- Manage the operational risk of a system failure due to a security breach or threat by implementing intrusion prevention and detection systems and real time monitoring and alerts for security breaches and by upgrading Endeavour Energy's Identity Management System; and
- Improve the ability to adapt to changes in the industry and marketplace by developing a sound and reliable security base for internal, remote and external access to data and systems and developing education programs.

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Target Environment

Changes in the way employees work, businesses conduct transactions, the consumerisation of IT and changing threat profiles require a much broader approach to establish effective security management. Endeavour's security focus is now changing from a strong technical and restrictive focus to a more integrated focus on business enablement.

The objective is to use security technology to support key business processes and most efficiently deliver business outcomes across the business. Effective use of technology will deliver improvements in safety, human resources, project management, business process and labour productivity.

Not only is the security technology integrated with the way we work with information technology on a daily basis, it is also increasingly being integrated with our core network assets to create an exponential rise in the source and amount of data being processed. The roll out of smart grid technology and protecting and securing the vast amounts of data generated and stored is of particular importance.

The key to the future success of security technology integration is to make the transition from restrictive access to an enabler of ongoing innovation leading to increasing productivity and customer value. This is driven by a much more computer-oriented and knowledgeable customer base, IT-savvy consumers and a switched-on mobile workforce.

In the next five years, Endeavour Energy will invest in IT security initiatives to:

- Guarantee the integrity of the data that will be collected and stored via the Smart Grid network. IT / OT integration dramatically increases the number of potential access points to Endeavour networks which need to be adequately protected. A significant amount of data will be generated on the OT network and will ultimately be used to drive decisions in the continuity of supply, demand forecasting and network planning;
- Enable secure mobile capabilities to support mobile workforce;
- Address the increasing amount of information sharing resulting from co-operation between the three NSW electricity distributors as a result of industry restructures;
- Address the increased information exchange and storage of data on non-Endeavour systems resulting from the market testing of certain business operations and the work being carried out by third parties on behalf of Endeavour Energy;
- Increase Employees, customers and consumers awareness of technology capabilities, the risks associated with using that technology and ways to mitigate those risks. Awareness programs will be developed to educate employees, third party suppliers, customers and consumers of value of information as an asset and the associated vulnerabilities, threats and the impacts of security breaches; and
- Continue to manage policies, procedures and standards and keep track of current and emerging security standards and applicability to Endeavour Energy.

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IT Strategic Objective	Business Drivers	Investment Initiatives	ICT Program
Deliver a scalable, reliable and secure platform for business systems	<ul style="list-style-type: none"> Business continuity Manage operational risk Improve the ability to adapt to changes 	<ul style="list-style-type: none"> Design an end to end security architecture Implement and consolidate a new intrusion prevention and detection system Real-time monitoring of activity and alerts for any events that may have the potential to adversely impact information security Upgrade identity management system. 	Information Security.

Security Architecture

This initiative will design an end to end corporate security architecture, design and review project security architectures and embed security governance in the software development lifecycle process.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status)	<ul style="list-style-type: none"> Do nothing is not considered as the risk to operations of Endeavour Energy will increase under this option. This option is not considered
Review and update architecture	<ul style="list-style-type: none"> A comprehensive security architecture that identifies and addresses risks identified.
Preferred case	<ul style="list-style-type: none"> Review and update architecture

The primary costs associated with this program of work are the development of a comprehensive security architecture that addresses risks identified. It is anticipated that there will be requirements to implement appropriate controls through software, processes and some hardware to ensure an agreed level of security risk can be maintained. Configuration of solutions has been estimated using a standard estimation model applied to all projects within the submission. An estimate for support has been included for operating expenditure as a result of this program of work.

Vulnerability and Threat Management

This initiative will implement and operate a system that monitors activity on the network in real time and provides alerts for any events that may have the potential to adversely impact information security.

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Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status)	<ul style="list-style-type: none">Do nothing is not considered as the risk to operations of Endeavour Energy will increase under this option. This option is not considered
Buy / Build	<ul style="list-style-type: none">Acquisition and implementation of a system that monitors real time threats and vulnerabilities.
Preferred case	<ul style="list-style-type: none">Buy / Build.

The primary costs associated with this program of work are the acquisition and implementation of a system that monitors in real time threats and vulnerabilities. Costs have been estimated based on market experience.

Identity and Access Management

This initiative will upgrade the Identity Management System to automate and monitor the employee and contractor access lifecycle and will implement and automate password reset functionality.

Options Considered:

Description of Option	Brief discussion of matters considered in reaching the preferred option
Contingency plan (maintaining status) i.e. Do Nothing	<ul style="list-style-type: none">Do nothing is not considered as the risk to operations of Endeavour Energy will increase under this option. The current process of managing passwords is highly manual. This option is not considered economically justifiable as the cost of manually managing passwords will continue to increase and exceed the cost of automating the password process.
Buy / Build	<ul style="list-style-type: none">Acquisition and implementation of a system that manages identity and access management.
Preferred case	<ul style="list-style-type: none">Buy / Build

The primary costs associated with this program of work are the acquisition and implementation of a system that manages identity and access management. Estimated costs are derived from expert knowledge & experience based on other security upgrade projects.

It is expected that a reduction in operational expenditure will be experienced based on the assumption that the cost of password resets being reduced / eliminated from baseline support.

Through improvements to the automation and employee lifecycle management, business risk will be reduced through more efficient provisioning and de-provisioning of access upon the employment and termination of employees and contractors.

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Investment Roadmap

Initiatives included in the ICT Investment Roadmap for 2015-2019 have been selected on the basis that they are clearly linked to the priorities of the business; comply with NER capital guidelines, resource availability for each financial year and to provide benefits directly linked to the strategic objectives of the organisation. The cost is in thousands of dollars (\$'000) and includes total regulated and unregulated investment. (96% of this is attributable to standard control services.)

Networks NSW Category	Major Program	Program	2015	2016	2017	2018	2019
Risk	Information Security	Security Architecture					
		Vulnerability and Threat Management					
		Identity and Access Management					
Totals							

Prioritisation

The key focus was to find the balance between recurrent expenditure needed to maintain a high level of performance for current systems and functionality and to equip the business with the tools and functionality needed to achieve strategic outcomes for safe, reliable and cost effective supply in a constrained expenditure environment. Only those projects that “do nothing” was not an option have been included in the investment program. The result of this approach is 21% on technical currency projects to deliver an assured business platform for operating the business and delivering supply. Only improve projects where positive benefits, improved risk mitigation, cost avoidance or cash savings that can be realised within the 4 years have been included in the program.

Leveraging Past Investment

A key investment in the current AER period was the delivery of high availability infrastructure. This has enabled us to implement technologies that automate operations across two data centres and therefore to over time provide the same level of availability at a reduced operational cost. The renewed architecture also drives the reduction in complexity by consolidating technologies and platforms which helps to further contain operating expenditure.

Prudent Cost Management

The capital constrained environment has required Endeavour Energy to look at capital efficient options to meet the critical needs of the business. The architectural principles that will be applied to achieve the required capital expenditure outcomes are as follows:

- Corporate Endeavour Energy strategy drives IT Architecture;
- Use a common technology infrastructure for deployment;
- Focus on a small set of strategic platforms;
- Re-use what is already there and

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- Assess solutions based on Total Cost of Ownership.

Benefits

To identify the success of return on investment, a benefits management plan has been established for each initiative. The table below lists the key initiatives with the indicative cost and associated benefits. The cost is in thousands of dollars (\$'000) and includes regulated and unregulated investment.

Program Title	Project	Project Descriptions	Total Cost	Business Benefits
Information Security	Security Architecture	<ul style="list-style-type: none">• Implement and operate a system that monitors real time activity on the network and alerts for any events that may have the potential to adversely impact information security.		<ul style="list-style-type: none">• Business Risk Reduction.
Information Security	Vulnerability and Threat Management	<ul style="list-style-type: none">• Implement and operate a system that periodically scans the network, systems and applications for threats and vulnerabilities.		<ul style="list-style-type: none">• Business Risk Reduction.
Information Security	Identity and Access Management	<ul style="list-style-type: none">• Upgrade of the Identity and Access Management System.• Implementation of automated password reset functionality.		<ul style="list-style-type: none">• Business Risk Reduction• Cost avoidance in automated password resets.

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APPENDIX A: ABBREVIATIONS

Shortened Form	Extended Form
AER	The Australian Energy Regulator
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
ASP	Accredited Service Provider
AUML	Average User Minutes Lost
BAU	Business As Usual
BPO	Business Process Outsourcing
BPM	Business Process Management
BTL	B2B tool for metering
CAMS	Customer Application Management System
CBM	Condition Based Maintenance
COAG	Council of Australian Governments
CSS	Customer Service System
DINIS	Distribution Network Information System
DMS	Distribution Management System
DUOS	Distribution Use of System (Charges)
EMSO	Emergency management Service Order
EPB	Electronic Pin Board
ERPS	Enterprise Resource Planning System
ESS	Employee Self Service
FIS	Field Inspection System
GIS	Geographical Information System

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HR	Human Resources
IAIMS	Integrated Advanced Information Management Systems
ICAM	Incident Cause Analysis Method
IGC	Investment Governance Committee
IPART	Independent Pricing and Regulatory Tribunal
ITIL	IT Infrastructure Library
LAN	Local Area Network
LMS	Learning Management System
LTIFR	Lost Time Incident Frequency Rate
MBS	Metering Business Systems
MCE	The Ministerial Council for Energy
MDP	Meter Data Provider
MP	Meter Provider
MSS	Manager Self Service
MVRS	Metre Vendor Reading System
NECF	National Energy Customer Framework
NMI	National Metering Identifier
NMP	Network Management Plan
NTS	Network Technology Strategy
NUOS	Network Use of Service
OMS	Outage Management System
OT	Operating Technology
PMC	Program Management Committee
PMO	Program Management Office

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PPMS	Project Portfolio Management System
QOS	Quality of Service
RCBM	Risk and Condition Based Maintenance
RIN	Regulatory Information Notice
ROI	Return on Investment
SaaS	Software as Service
SAIDI	System Average Interruption Duration Index
SAMP	Strategic Asset Management Program
SCADA	Supervisory Control and Data Acquisition
SCER	Standing Council on Energy and Resources
SCI	Statement of Corporate Intent
SENI	Serious Electrical Network Incident
STPIS	Service Target Performance Incentive Scheme
SWMS	Safe Work Method Statement
TCA	Testing & Certification Australia
WAN	Wide Area Network
WMS	Works Management System

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APPENDIX B: PROJECT COST MODEL

PROJECT COST ESTIMATION METHODOLOGY

The program estimates developed for the five year regulatory period have been obtained using a standard cost model to ensure consistency in project estimation and costing.

The model determines costs by the examining the following factors:

- Type of project;
- Complexity of project;
- Duration of project (no of weeks);
- Standard PM cost - Cost per day for a PM (blended rate from current outsource contracts) and
- Multiplier for project phase - Allocation of no of PM days per week multiplied by complexity of project, phase multiplier then applied.

The model uses empirical data derived from past projects and unit costs based on Endeavour's current service and supplier contracts, including the NSW SCCB where applicable.

To ensure that the model is robust and repeatable it was validated by putting a number of previous completed projects (of different types) through the model to determine level of accuracy to actual costs. Modelled outcomes were remarkably close in estimation to historical costs for similar type projects.

DETAILS AND ASSUMPTIONS

General Assumptions

- Only capital expenditure to be included in project cost models and
- Operation expenses excluded

Estimation Assumptions

Project Type - Projects of similar type and complexity will have similar proportion of development costs as a multiplier of PM time. Projects have been categorised as configuration only, software customisation of new systems, requests for change to existing systems, upgrades to existing systems and enhancements.

Complexity Multiplier – a complexity factor is used in the cost calculations to distinguish between a simple, medium and complex project. The complexity level is calculated as a factor of the number of vendors and number of interfaces involved in the implementation and the project type. **Project Management** – project management costs are based on a standard daily rate with the complexity factor applied. The complexity levels dictate the level of project management effort required per week to undertake the project. The standard daily rate is based on a blend of Project Manager rates provided by current contracted outsource providers.

Project Phase Multiplier – The total of the development, test and implement phases are based on a project phase multiplier and the project type. The apportionment of costs across each

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development phase of a configuration project is based on a study of projects undertaken over the 2009-2014 determination period. The assumption behind the calculation is that projects of similar type and complexity will have similar proportion of development costs as a multiplier of PM time.

Integration Costs – Integration costs are calculated as a standard cost per interface. The calculation for Integration costs is based on the assumption that new interfaces will attract a higher per unit costs due to increased design / build / test costs associated with a new interface. Upgraded interfaces will attract a lower per unit cost as they will require update of existing documentation/code and testing documents only. Estimated cost is based on per unit costs calculated for previous projects.

Business Change Management - The assumption behind the calculation for change management is that costs are directly attributable to the complexity of change introduced by the project and the number of end users affected by the process changes. Change management costs included in the capital estimate of the project includes the development of training materials and stakeholder management undertaken during the course of the project.

Transition – Costs of transitioning a project to support reflect an average of transition costs charged to like type projects from the 2009-14 determination period and are determined as a percentage of total project costs. The percentage ranges from 5% to 8% dependent on the project type.

A higher % is allocated to new software as a new transition agreement must be created and education undertaken for the outsource provider to accept support responsibilities for the application. Transitions to existing software are costed at a lower % reflecting that existing agreement, documentation and skill set already exists and only needs modification.

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APPENDIX C: ENDEAVOUR ENERGY'S ICT METRICS

The objective of the ICT Investment Plan is to create opportunities for Endeavour Energy to deliver value to customers, stakeholders and the community. The selection of the projects has been driven by Endeavour Energy's corporate objectives, including safety goals, and their alignment to strategic focus areas for ICT:

1. To invest in technology that empowers staff and business partners to provide cost effective services and support decision making through the provision of accurate and timely information.
2. To provide cost effective implementations and cost savings to meet the demands of the NNSW commitments to cost reduction.
3. To deliver on NECF requirements.
4. To implement technology required to deliver cost effective processes and market interaction required of the Network Only Business.

The effectiveness of IT investment is measured by benefits realisation at a project level. Benchmarking is used to assess the performance of IT service delivery and expenditure in both capital and operational costs to drive efficiencies and to measure the effectiveness of investment in software, hardware and tools to support service delivery.

Endeavour Energy's ICT performance is measured through a number of performance indicators (metrics) benchmarked against other utility businesses in NSW, Queensland and Victoria. The assessment of these metrics was carried out by KPMG in November 2010, April 2012 and September 2013 and have been summarised in the table below. Assessment of these metrics has been undertaken to ensure that the planned capital expenditure outlined in the AER submission metrics is consistent with industry standards and to identify areas of improvement and where we able to leverage capital investment to achieve business outcomes.

Outlined below is Endeavour Energy's performance to other utilities and how benchmarking has been used to deliver value. Three areas that have influenced ICT investment are outlined below. These are:

1. Endeavour Energy has higher IT Operational Expenditure.
2. Endeavour Energy has the highest share of Outsourced Services.
3. Endeavour Energy has lower Capital Expenditure than the benchmark.

IT Operational Expenditure: The 2013 ICT benchmarking results reveal that Endeavour Energy's ICT operational expenditure including depreciation is higher than the benchmark mean when measured as a % of corporate operating expenditure including depreciation (8.72% Endeavour Energy vs. 6.91% mean), per user excluding depreciation (\$18,088 Endeavour Energy vs. \$11,381 mean) and per client device (\$19,756 Endeavour Energy vs. \$11,459 mean). The "total ICT expenditure as a % of corporate total expenditure" is higher than the benchmark mean (5.69% Endeavour Energy vs. 4.89% mean) and the "ICT operating expenditure including depreciation as a % of revenue" is higher than the benchmark mean (5.00% Endeavour Energy vs. 4.21% mean). Each of these measurements has also increased in value from 2012 to 2013.

The development of the ICT investment plan has focused on capital expenditure that will result in a reduction in operational expenditure, examples include:

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1. Investment in projects that will result in an assured business platform by eliminating legacy applications, legacy operational systems and legacy operating platforms which are inherently expensive to operate and maintain.
2. Investment in projects that will allow improvements in mobile technology to reduce the operational costs of field service management and reduced handling of data such as multiple data entry into disparate systems.
3. Investment in projects that will provide more efficient ICT processes to support the on-going establishment of a networks only business eliminating operational process costs.

Outsourced Services: Endeavour Energy has a sourcing strategy that is focussed on achieving best value for the Endeavour business. This sourcing strategy includes having contracts with Optus and CGI (formerly Logica) for the delivery of its IT Service delivery. 74% of Endeavour Energy's IT operating expenditure is spent on outsourced services. This is the highest compared to other utilities in the benchmarking group. During the current AER period Endeavour Energy has focussed on reducing ICT operating expenditure to contribute to the corporate goals of network tariff control by undertaking the following:

1. Implementing a broader multi-vendor outsourced model to drive costs reductions and improve quality of support through the engagement of specialist vendors for specific technology stacks.
2. Renegotiating outsourced contracts to reduce costs.
3. Rationalising and decommissioning hardware and application to reduce costs.
4. Adoption of Shared Services with Ausgrid in the areas of metering and billing.
5. Leveraging the power of three OpCOs to secure cost effective services.

These activities will continue into next AER period and their effectiveness will be monitored and measured through on-going market tests, benchmarking, and revising contractual coverage to ensure that outsourced services and Shared Services continue to provide value for money.

As a result of the outsourced IT strategy, Endeavour has the second lowest number of internal IT employees which is consistent with an IT service delivery model using external outsourced service providers.

IT Capital Expenditure: Endeavour Energy's IT capital expenditure as a percentage of corporate capital expenditure is lower than the benchmark mean (2.71% Endeavour Energy vs. 4.48% mean).

The low capital expenditure is also reflected in the reducing value of IT assets and the low IT asset value in comparison to the benchmark (0.74% Endeavour Energy vs. 1.59%) as measured by the "IT asset value as a % of regulated corporate asset value" which is consistent with Endeavour Energy's use of ageing systems and low capital expenditure in recent years. Endeavour Energy's actual capital expenditure for the period 2009/10 – 2013/14 was \$101 million which was approximately \$17 million below the AER submission forecast, due primarily to the deferment of capital programmes of work. This AER submission includes investment in projects that addresses previous capital deferment that will result in an assured business platform by eliminating legacy applications, legacy operational systems and legacy operating platforms.

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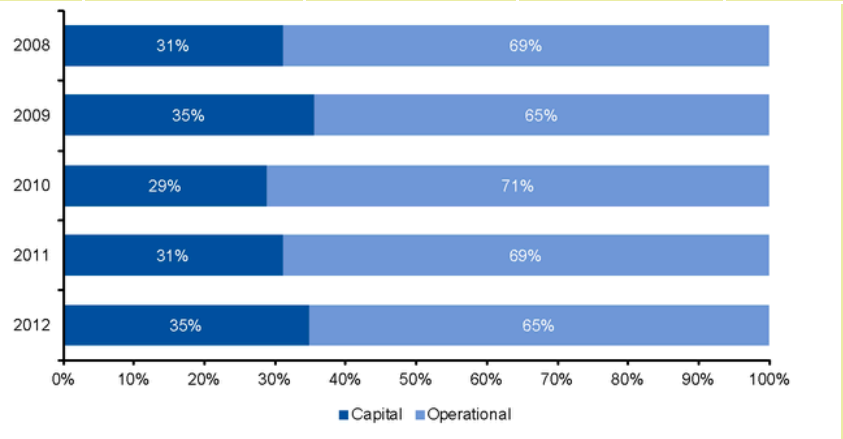
Benchmark (Metric Type)	Ref.	2010	2011	2012	2013
ICT Capital expenditure as a % of corporate capital expenditure	Mean	4.82%	5.30%	5.65%	4.48%
	IE/EE	3.94%	5.77%	3.24%	2.71%
Total ICT expenditure as a % of corporate total expenditure	Mean	N/A	N/A	5.38%	4.89%
	IE/EE	N/A	N/A	5.57%	5.69%
ICT operating expenditure including depreciation as a % of corporate revenue	Mean	3.23%	3.49%	4.25%	4.21%
	IE/EE	3.34%	3.68%	5.05%	5.00%
ICT operating expenditure (including depreciation) as a % of corporate operating expenditure *+	Mean	3.92%	4.30%	6.59%	6.91%
	IE/EE	3.83%	4.49%	8.37%	8.72%
ICT operating expenditure (excluding depreciation) as a % of corporate operating expenditure *+	Mean	2.71%	3.08%	5.13%	5.25%
	IE/EE	2.79%	3.48%	7.62%	8.26%
ICT operating expenditure (exclude depreciation) per user *+	Mean	\$11,022	\$11,544	\$11,041	\$11,381
	IE/EE	\$15,679	\$16,665	\$16,023	\$18,088
ICT operating expenditure (exclude depreciation) per client device *+	Mean	\$10,400	\$10,264	\$10,277	\$11,459
	IE/EE	\$16,916	\$17,980	\$18,763	\$19,756
Category breakdown of total ICT operating expenditure (exclude depreciation) *+	Mean	16% Hardware 21%, Software 9%, Carriage 18%, Services outsourced 24%, Internal personnel 9%, External personnel 5%, Others	14% Hardware 19%, Software 8%, Carriage 21%, Services outsourced 23%, Internal personnel 7%, External personnel 8%, Others	7% Hardware 18% Software 15% Carriage 22% Services outsourced 25% Internal personnel 10%, External personnel 4% Others	5% Hardware 17% Software 12% Carriage 19% Services outsourced 24% Internal personnel 19%, External personnel 14% Others
	IE/EE	6% Hardware 14% Software 11% Carriage 52% Services outsourced 12%, Internal personnel 3%, External personnel 1%, Others	6% Hardware 13% Software 12% Carriage 49% Services outsourced 15%, Internal personnel 4%, External personnel 2%, Others	10% Carriage 74% Services outsourced 16%, Internal personnel	9% Carriage 74% Services outsourced 16%, Internal personnel
ICT asset value as a % of regulated corporate asset value *+	Mean	1.35%	1.41%	1.63%	1.59%
	IE/EE	1.22%	0.89%	0.74%	0.74%

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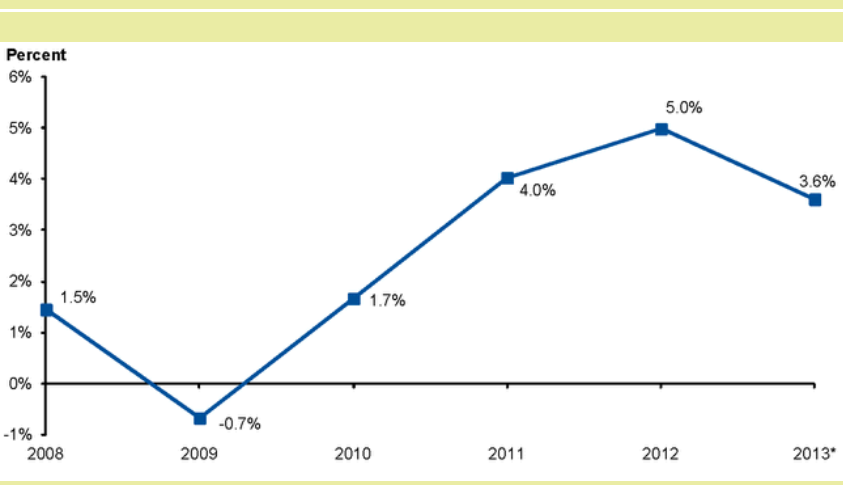
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Total ICT staff as a % of corporate staff +	Mean	5.4%	5.74%	6.00%	5.94%
	IE\EE	2.42%	2.34%	2.33%	2.84%
Total annual expenditure on outsourcing arrangements as a % of ICT operating expenditure (exclude depreciation) +	Mean	17.7%	21.3%	23.7%	23.9%
	IE\EE	51.9%	49.0%	74.2%	74.3%

Utilities: IT Operational vs. Capital Spending £



Utilities IT Spending Percent Change £



*Note: The value for 2013 is a projected figure, and is based upon projected 2013 IT budgets provided by Gartner clients.

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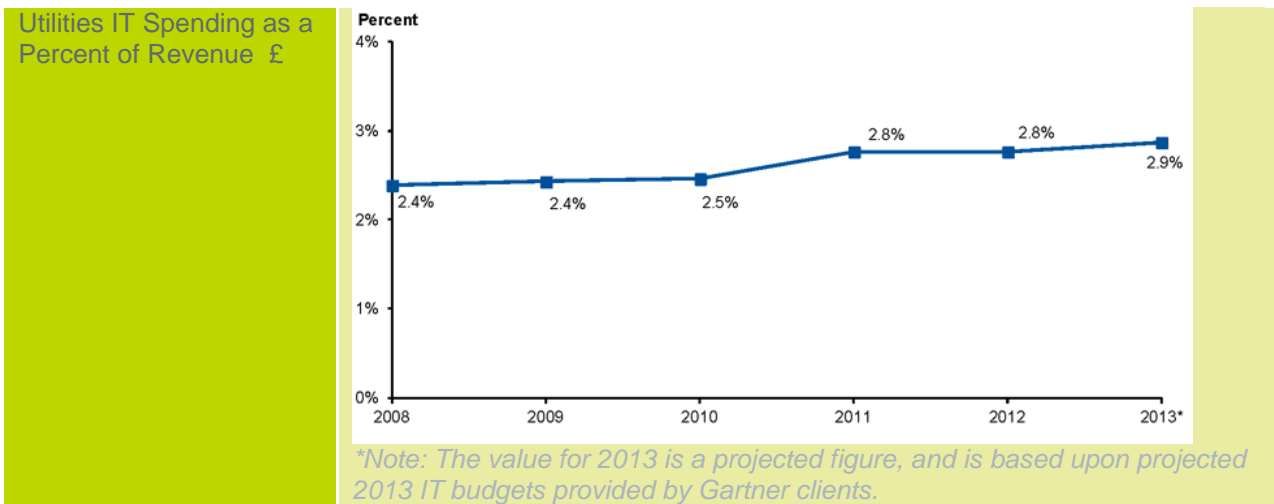


Table 1 IT Benchmarking Metrics

* Source: "2011 Utilities IT Benchmarking". Produced by KPMG for Endeavour Energy on 27 April 2012.

+ Source: "2013 Utilities ICT Benchmarking – Draft Final Report". Produced by KPMG for Endeavour Energy on 24 January 2014.

£ Source: Gartner IT Key Metrics Data (December 2012)

Average User Minutes Lost (AUML)

The provision of a reliable, available and secure business platform is one of the main goals of ICT operational services. The investment in capital expenditure projects and adoption of the ITIL (IT Infrastructure Library) framework of best practice guidance for IT Service Management has aligned IT services to the needs of the business and core business processes and delivered improved cost effective and reliable IT system performance. This is reflected in the AUML that tracks the Average User Minutes Lost, which is an important measure for a business that increasingly relies on computing to deliver cost effective service.

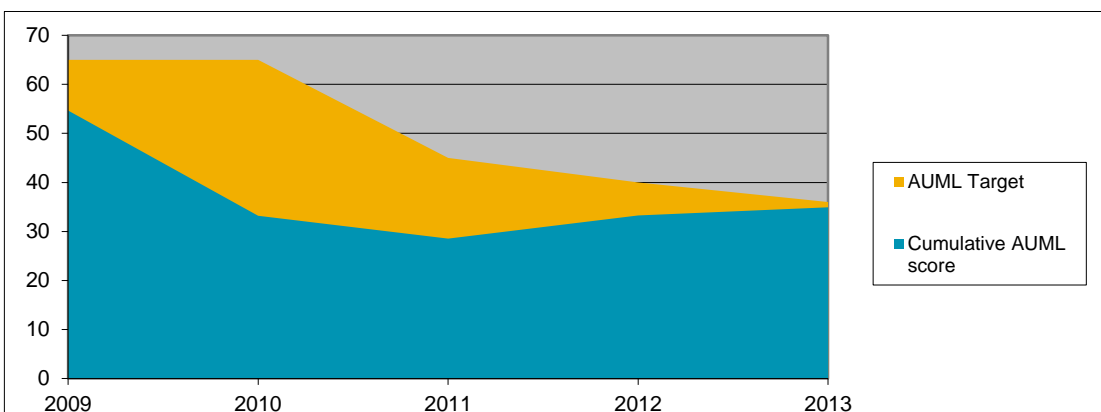


Figure 1: AUML summary 2009-2013

The focus on lower ICT support costs through rationalisation of software, hardware and support service levels has enabled significant cost reductions in the current AER period. Further investment in technology is needed to deliver the increased service levels required by the business in a prudent and cost effective manner.

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APPENDIX D: UNPRIORITISED PROGRAM

The table below provides a list of all initiatives put forward for consideration for the 2015-2019 determination.

Note: Project values contained within this list are indicative values only and were entered into the project cost estimator following the business review of this listing in order to apply a more consistent cost model to all projects.

Proposed AER Investment Requirements 2015-2019				
Metering to Cash				
Project / Program	Assumptions	Hardware/Software	Investment type	Investment Requirement \$'m
MBS Upgrade and Enhancements	MBS owned by Ausgrid who will pay for changes to system. If Endeavour Energy requests enhancements will be paid by Endeavour Energy. Network readiness changes to be done before 2014.	Software	Technical Currency	
Click Upgrade	Technical upgrade within 3 years due to the rapid development and advancements in mobility solutions and software.	Software	Technical Currency	
Banner Replacement - Network only customer information system and billing	Assumptions: Infrastructure already exists, not included in these estimates. Network billing remains in each Network Billing, Implement ASP Billing in 2014/15 for ██████ Network customer info system 2015-2017 for ██████ New Network Billing system to replace Banner (which will be 20yrs old by 2019) 2017-2019 ██████	Software	Technical Currency	
nemSTAR Replacement	Assumptions: Infrastructure already exists. Single contestable metering business for NSW and therefore migration to single organisation; No rollout of smart meters to Endeavour Energy franchise; nemSTAR replacement for 20,000 metres, migrate to Ausgrid in early 2015 ██████	Software	Technical Currency	
Metering system integration to streamline data capture and management	██████████	Software	Cost Effective IT	
NEMM system changes to comply with changes to market interface requirements	██████████	Software	Technical Currency	
nemSTAR integration and data capture from field		Software	Agility	
Metering Mobility Project	██████ implementation half way through determination period	Software	Agility	
Migration of Meters and Meter provider applications	Migrate meter provider apps to TCA (Ausgrid 'Infomet') ██████ late 2014. Meter asset migration to MBS ██████ '15.	Software	Cost Effective IT	

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Finance			
Project / Program	Application	Assumptions	Investment Type
Financial Modelling and budgeting tool	TM1	High level estimate	Technical Currency
Supply Chain process Improvement - Inventory Optimiser	Optimiser	Upgrade to OAS 6.2 in 2009. Possible upgrade to SaaS version. Some enhancements may be required due to Ellipse upgrade and the suggestion of significant changes to materials module. Assume [REDACTED] in 2016/17 and [REDACTED] in 2017/18 for enhancements due to Ellipse upgrades.	Technical Currency
Supply Chain process Improvement - e-procurement & contractor management (system consolidation)	E-procure/contractor Mgmt.	<p>1. Module for Supplier pre-qual and quality register and on boarding. Project is due to commence in 12/13 starting with large suppliers and procurement of services with expansion to all purchasing processes by 13/14</p> <p>2. Implementation of a module for tendering and contract mgmt. by 14/15</p> <p>Preferably a hosted solution that can integrate to ERP for suppliers, orders and payments</p> <p>3. Enhancements for B2B processes including communication of orders to suppliers and integration of supplier invoicing - Kofax, Envoy and/or new hosted soln</p> <p>4. Development of full workflow of procurement processes</p> <p>5. Enhanced reporting including development of dashboards</p> <p>Assume [REDACTED] from 15/16 for general process improvements and integration. Additional [REDACTED] in 2016/17 and [REDACTED] in 2017/18 for enhancements due to Ellipse upgrades.</p>	Agility
Supply chain process improvement - credit card management	ICMS	Currently being enhanced - automation of interfaces, new reports. Last upgrade 2009. Possible upgrade in 14/15	Agility
Automation of finance processes		High level estimate	Cost Effective IT
Treasury management system - technical currency	Treasury and Banking software	Assumption that there will be little change in the treasury systems. However, there is a great need to automate the current bank reconciliation process. Project to re-engineering processes and implement bank reconciliation software to commence late 2012/13 and continue into 2013/14 for implementation. Assume further integration and process improvement in 15/16	Technical Currency
Kofax Upgrade and Integration	Kofax	Upgrade of software in 2012/13 to work with Windows 7. Further enhancements for reading, transforming and integrating scanned invoice information with information management system and Ellipse. Initiative expected to commence 2012/13 after upgrade. Further integration enhancements may continue into 13/14.	Technical Currency

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Compliance and Governance			
Project / Program	Application	Assumptions	Investment Type
BMS Technical Currency	Business mgmt. System	Repository for the management of corporate and business policies and procedures. New BMS will be in place 2013/14 year - technical currency required in 16/17	Technical Currency
Docs Technical Upgrade / IM Program	Document Management	Assumes there is no appetite to complete the IM strategy from the business - [REDACTED] required to implement the strategy is excluded here (currently on hold). Also excludes BMS upgrade (part of IM roadmap). Tech currency of edocs twice in 5yrs, 2x BC [REDACTED] each. [REDACTED] for enhancements of security, metadata and governance of existing base.	Technical Currency
Compliance System upgrade extend rollout	Compliance Software	Implemented 2008. Possible project to incorporate other business areas with compliance requirements to ensure single source of information and to achieve process enhancements Possible upgrade 2014/15	Technical Currency
Sub delegations system upgrade & enhancements	Sub delegations	Phase 2 enhancements to be delivered 12/13. Assume 20k in 2016/17 and 2017/18 for enhancements due to Ellipse upgrades.	Technical Currency
Team Mate Upgrade	Audit - CCH Team Mate	Implemented 2008 - possible upgrade to R10 required in 2013/14 and assume another upgrade in 2017/18	Technical Currency
	Consultation Mgr.	Additional licences bought in 2010. Increase from 20 to 100. No additional licences expected	
Lex Upgrade	Legal - Matters Mgt	Implemented in 2009. Upgraded in 2010. another upgrade planned for 2015/16	Technical Currency
Network Asset Management			
Project / Program	Application	Assumptions	Investment Type
DINIS hardware replacement	DINIS	Infrastructure upgrade in 2012/13. RDB upgrade and retirement of old DINIS functionality to commence in 2012/13 and expected to extend in to 2013/14 plus further enhancements to meet business requirements in 2013/14 and 2014/15. Minor enhancements for 2015/16	Technical Currency
DINIS RDB Enhancements (Transmission)	DINIS	High level estimate	Cost Effective IT
DINIS RDB Enhancements (Distribution)	DINIS	High level estimate	Cost Effective IT

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Program Management Solution (PPMS) Phase 2	PPMS	1x upgrade cycle in 2017 for \$2mil. [REDACTED] for enhancements of application driven by business.	Technical Currency	
CAMS Enhancements	CAMS	Implemented 2008 and significant updates made in 11/12. Enhancements for automation and integration to proposed new ASP website. Significant enhancements in 2013/14 and 2014/15 required to meet requirements of NECF - changes to milestones and triggers, SLA's for cust interfacing processes.	Cost Effective IT	
CAD Technical upgrade & integration enhancements	CAD	Three year upgrade cycle. Currently being upgraded to 2010 version. Next upgrade due 2014/15 and then again in 2017/18. Possible enhanced integration to GIS and Ellipse and small design apps (poleswires, perfect lite) as part of upgrade in 2014/15	Technical Currency	
Field Force Automation	Various	Productivity Data Integrity / Quality Remote Access OH&S Embedded Generation Schematics to field, document and digital library management to field	Agility	
LV Control Management		Facilitate Embedded Generation PEV	Cost Effective IT	
FIS Technical Enhancement	FIS (include in FFA programme)	Enhancements to be completed before 2014, Upgrade again in 2016.	Cost Effective IT	
Workforce Scheduling	Workforce Scheduling	Ph 1 Project to implement by 2013 with estimated budget of \$ [REDACTED] Integrate with FFA planned for 2014-2016. Include dispatch & Integration	Agility	
TX Maintain Technical currency	TXMaintain	No initiatives planned. Support and maintenance except for modifications that may be required to web services as a result of Ellipse upgrades. [REDACTED] plus another [REDACTED] in 2016/17 and 2017/18 for enhancements due to Ellipse upgrades.	Technical Currency	
Nemo enhancements	NEMO	No initiatives planned. Support and maintenance except for modifications that may be required to webservices as a result of Ellipse upgrades. [REDACTED] plus another [REDACTED] in 2016/17 and 2017/18 for enhancements due to Ellipse upgrades.	Technical Currency	
WMS Technical currency	WMS	Assume upgrade of the WMS application, Oracle DB and server for technical currency in 2013/14. Some enhancement to interfacing included.	Technical Currency	
Poles n Wires upgrade	Poles n Wires	Assume minor upgrades of app (2 per year). Client distribution costs of [REDACTED] upgrade. Possible integration to CAD in 2014/15	Technical Currency	

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Perfect Lite Upgrade	Perfect Lite	Assume minor upgrades of app (2 per year). Client distribution costs of \$[REDACTED] per upgrade. Possible integration to CAD in 2014/15	Technical Currency	
Risk & Criticality Maintenance Program	Various & Ellipse	Program of work to incrementally roll out implementation of risk and criticality maintenance (PAS55) out to each equipment class. This will largely depend on the historical data that has been collected for each type of asset to determine the configuration and ongoing data capture requirements	Agility	
FFA Upgrade - Real time data exchange		Wi-Fi & 4g network access, intranet and internet for mobility front end user portal development	Agility	
GIS v10 Upgrade	GIS	Upgrade cycle every 5 years. Allow for enhanced functionality	Technical Currency	
OMS Applications Upgrade	OMS	Implemented in 2007, upgraded 2012, next upgrade cycle again in 2017. Some of OMS Phase 3 application upgrade to feed into 2014/15	Technical Currency	
SCADA replacement	SCADA	Scada replacement planned for 2013/2014. Capex to come from SARP-Network budget? What about Scada comms and technology upgrade? Scada allow [REDACTED] for enhancements out of SARP budget.	Technical Currency	
Network System enhancements - small initiatives	GIS	Estimates based on previous 5 year trends	Cost Effective IT	
Network System enhancements - small initiatives	FIS	Estimates based on previous 5 year trends	Cost Effective IT	
Network System enhancements - small initiatives	OMS	Estimates based on previous 5 year trends	Cost Effective IT	
Network System enhancements - small initiatives	Ellipse	Estimates based on previous 5 year trends	Cost Effective IT	
Network System enhancements - small initiatives	CAMS	Estimates based on previous 5 year trends	Cost Effective IT	
Network System enhancements - small initiatives	CAD	Estimates based on previous 5 year trends	Cost Effective IT	
Network System enhancements - small initiatives	PPMS	Estimates based on previous 5 year trends	Cost Effective IT	
Request IT / SwitchIT FFA enhancements	Request IT/Switch IT	Project in 12/13 for uploading of secure documents and developing integration of asset information with Ellipse. Enhancements will be required for Field Force Automation estimated at [REDACTED] pa until replaced by DMS system (target 17/18). General minor enhancements assumed to be [REDACTED] until then.	Cost Effective IT	

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NAAS Upgrade and enhancements	NAAS	NAAS Upgrade to Version 4 Self-Service Enhancements. Assumes delayed commencement and deployment carried forward from 12/13 to 13/14. Normal support and some minor enhancements from then on.	Technical Currency	
Shocks Enhancements	Shocks	No changes to the web front end except for modifications that may be required to webservices as a result of Ellipse upgrades. [REDACTED] enhancements due to Ellipse upgrades.	Technical Currency	
DBYD integration to Edocs	DBYD	Initiative to automate DBYD manual processes and integration to edocs in 2011/12 maybe continuing into 12/13. General minor enhancements [REDACTED]	Agility	
Operational Asset Data Store / Data Mining		Data store to support OT data collection for transformation into IT provided Asset management applications - high level estimate	Agility	
Data Integration/Tracking tools		High level estimate	Agility	
Online Training & Support Modules		High level estimate	Cost Effective IT	
Outage Data Mart Upgrade and Enhancements		High level estimate	Agility	
Link to store OT data and integrate to IT (Maintenance Data mart extension)		Provide data store and mining tools for operational reporting - High level estimate	Agility	
Distribution Management System	DMS - SCADA	Entire DMS program will cost between \$ [REDACTED] and is required for Industry Standard Enabler for DFA / VVC SCADA renewal Consolidated Network Solution (will be included in SAMP budget)		
Distribution Management System	DMS - OMS Integration			
Distribution Management System	DMS - DFA			
Distribution Management System	DMS - Volt Var Control (VVC)			
Distribution Management System	DMS - Dsubs			
Distribution Management System	DMS - Historian			
Replace Network Data stores		access databases & NLH replacement - high level estimate	Technical Currency	

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Safety			
Project	Application	Assumptions	Investment Type
Fatigue Management	New	New solution to track hours worked by individual employees. Mobile solution to be made available in trucks. Assumes usage of existing devices or use of iSAFE solution. Funding in 2016 & 2017 assumes that we will extend the solution to vendors / contractors or to Ausgrid / Essential employees - high level estimate	Cost Effective IT
Safety Training	New	Online delivery and tracking of safety training for employees. Including ICAM investigation training, Safety competency modules, ongoing drug and alcohol training - allowance of [REDACTED] to develop and rollout modules (to emps, contractors and vendors), allowance of \$[REDACTED] in 2015 to build e-learning / LMS integration & external portal	Cost Effective IT
Automated Audit and Investigation - mobile solutions / Mobile Health & Safety		Mobile deployment of existing H&S system	Agility
Enhanced Health and Safety Reporting		Reporting will be generated out of Incident management system using standard tools. Allowance of \$[REDACTED]	Cost Effective IT
DBYD data improvements	GIS	Improvement of data stored in GIS to prevent inconsistent data being generated for third parties (will be delivered by Network program)	Cost Effective IT
Mobile SWMS		Will utilise mobile technology deployed for other solutions. SWMS accessible via intranet	Agility
Online Shocks Solution	Internet	Internet capability for reporting of customer shocks for investigation	Cost Effective IT
Safety System Upgrade and Enhancements	Safety Management	Enhancements for Fatigue management; drug&alcohol; mobile swms; prequalification questionnaire; H&MS enhancements; dashboard reporting; Lead indicators - [REDACTED] Upgrade in 5 yrs 2018	Cost Effective IT
Ellipse Integration for fatigue management	Ellipse	Assumes that daily web timesheets rolled out to ensure timely data to be retrieved	Agility

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Recruitment to Retirement			
Project / Program	Application	Assumptions	Investment Type
Corporate System enhancements - small initiatives	Figtree	Based on previous 5 year trends	Cost Effective IT
Corporate System enhancements - small initiatives	e-recruit	Based on previous 5 year trends	Cost Effective IT
E- Recruitment Process enhancements	E-recruitment	Enhancement projects for process automation & integration, process enhancement, enhanced security etc.	Cost Effective IT
LMS - Process enhancements	Learning mgt system	Implementation of one integrated training management solution to be implemented in 2012/13. Assume [REDACTED] for 2012/13 for process enhancements to allow for self-service nomination and approval of training courses. Integration with online/web based training delivery and assessment. (Utilised by technical training, apprentice training and corporate training)	Agility
Figtree Technical Currency	Figtree	Minor changes to application for reporting, usability and integration in 2013/14. Potential upgrade to Oracle database and latest version in 2015/16	Technical Currency
Document Routing & Approval Workflow Program	Various	Program of work to implement Document collaboration, routing and approval workflows to key HR functions to eliminate paper based functions.	Agility
Web based / mobile timesheet	Ellipse	Implementation of web based timesheet to complement work scheduling and dispatch automation. Assumes mobile device available at least crew level. Complements fatigue management initiative	Agility
Asset management tracking for employees	Ellipse	Tracking of assets assigned to employees. Business process enhancements required to enable easy updates throughout the lifecycle of asset assignment and for the ease of reporting and update on termination of the employee	Agility
IT Support – Shared Applications			
Project	Application	Assumptions	Investment Type
Ellipse Upgrade	Ellipse	Upgrade to Ellipse 10	Technical Currency
Desktop Application Upgrade	Desktop Applications	No upgrade cycle as extended support for Win7 and Office 2010 until 2020. Support for MS CCM until 2022	Technical Currency

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JCAPS upgrade	Jcaps	Assumptions - Need to identify gaps, not all of Jcaps components have been upgraded; Infrastructure is in place; no industry reform impacts; CTech currency upgrade, Jcaps to be supported til end of 2019; License capacity exists no additional licenses. \$ [redacted] BC for tech currency upgrade, [redacted] for 2 years for revision of stds and arch; [redacted] business and decomm Retail components.	Technical Currency	
JCAPS revision of architecture and standards	JCAPS	Assumptions - Need to identify gaps, not all of Jcaps components have been upgraded; Infrastructure is in place; no industry reform impacts; CTech currency upgrade, Jcaps to be supported til end of 2019; License capacity exists no additional licenses. [redacted] for revision of stds and arch; [redacted] only business and decomm Retail components.	Technical Currency	
JCAPS re-integrate for Network only business	JCAPS	Assumptions - Need to identify gaps, not all of Jcaps components have been upgraded; Infrastructure is in place; no industry reform impacts; CTech currency upgrade, Jcaps to be supported til end of 2019; License capacity exists no additional licenses. [redacted] for tech currency upgrade, [redacted] 2 years for revision of stds and arch; [redacted] re-integrate or re-architect Network only business and decomm Retail components.	Technical Currency	
Reporting System Upgrade & Enhancements	Cognos Catalog Upgrade	Assumptions - infrastructure is in place; no industry reform impacts; Cog 8 to Cog10 upgrade; License capacity exists, no additional licenses. [redacted] tech currency upgrade [redacted] for enhancements to ETL reports; [redacted] to replace TM1	Agility	
Web and Internet Platform Upgrade and Enhancements	Web and Internet	Platform upgrade \$ [redacted] and upgrades [redacted] over 5 years. Assumes any major changes to be included in separate business project BC.	Technical Currency	
Identity Management Upgrade	Identity Management	Enhancements will be done before 2014. Vendor advises next system upgrade is due in 2014.	Cost Effective IT	
IT support - Small initiatives	Security		Cost Effective IT	
IT Support - Small equipment purchases	Small Equip		Cost Effective IT	
WEB Performance Improvement			Technical Currency	
Web Mobility - Collaboration tool - Intranet			Agility	
Web Mobility - Collaboration tool - Internet			Agility	
Web Mobility - Mobile Intranet			Agility	

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Web Mobility - Mobile Enterprise Search			Agility	
Web Process Automation			Agility	
IBM WCM & Intranet Portal Upgrade		Technical Currency	Technical Currency	
Intranet as process portal for employees, contractors and service providers (process hub)	Web and Internet		Agility	
New Domain Name		Technical Currency	Cost Effective IT	
Primavera - process improvements	Primavera/Prosight	Currently being upgraded to V9 in 11/12 fin yr. Move to implement MS project server in 12/13. Possible carry over in to 13/14 fin yr.	Cost Effective IT	
Iserver - process improvement	Enterprise Architecture Tool - Iserver	Further modelling enterprise modelling and another 5 licences in 2013/14	Cost Effective IT	
Document Routing and Approval software	e.g. Adobe Lifecycle	Purchase / licencing of document routing / collaboration software to support process automation initiatives in Employee lifecycle, Safety, Network Asset Management etc.	Agility	
Document Approval processes integration points		Development of integration points to support document management and approval initiatives	Agility	
IT Support - Infrastructure				
Project	Application	Assumptions	Investment Type	
Unix Platform Renewal (Midrange Renewal)		Starts 2013/14 initial BC of █████ 24 month program. Go to market for commodity hardware. Includes the refinement of Oracle licensing.	Technical Currency	
Intel server system refresh (VMWare Renewal)		Starts 2013/14 initial BC of █████ 4 year program.	Technical Currency	
Database technical currency (Oracle Consolidation)			Technical Currency	
DR Capability Enhancement program		Starts 2013/14 initial BC of █████ 3 year program.	Cost Effective IT	
Call Centre consolidation		Assumes will be completed in 2013, with enhancements in 2014	Cost Effective IT	
Thin Provision Implementation and Storage Management (Storage Architecture)		Starts 2013/14 initial BC of █████ 5 year program.	Cost Effective IT	
Integration Platform		Initial capital spend to design and build new platform Migration cost of existing essential interfaces Build and commission reusable services (this must reduce the capital spend for integration component in projects) Keep platform and services current	Technical Currency	

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Capacity Management / Backup Infrastructure (Backup Consolidation)			Cost Effective IT	
Mobility Platform & Devices		Costs to be estimated based on device provided to individuals or crews? Impact of BYOD enablement?	Agility	
Security Platform			Cost Effective IT	
CMDB			Technical Currency	
Lifecycle Management			Cost Effective IT	
DR Enhancements			Cost Effective IT	
Application Performance Monitoring			Cost Effective IT	
Licence Management			Cost Effective IT	
IT Support - Communications				
Project	Application	Assumptions	Investment Type	
ICT Comms Infrastructure (annual FY 2014-2018 Property Related & Operational Comms Requirements)	This project involves the provision of essential data and voice comms infrastructure in Huntingwood and depots. It includes comms cabinets and cabling in comms rooms where required.	This budget is to support any additional telecommunications infrastructure required by the business not captured in any related project	Technical Currency	
Unified Messaging integration to IP Telephony	This project is to integrate the IP Telephony voice mail to Microsoft Exchange mail platform.	The voice mail solution will be Microsoft Exchange mail platform	Cost Effective IT	
Collaboration (VC-Desktop-Mobile Devices)	This project is to provide collaboration tools which involves integration of the videoconferencing system with the desktop and Mobile devices.		Agility	
Mobile Handset Integration to Voice Network (Dual Mode)	This project is to integrate the mobile handsets into the voice system. This will provide roaming capabilities of the mobile handset similar to that of a telephone extension while within Huntingwood.		Agility	
WAN Equipment Refresh (Router Replacements)	This project is an infrastructure refresh project to replace end of life routers for the wide area network. The existing routers were installed in 2005.	End Of Software support is Nov 2014 and End Of Hardware support Is Nov 2016.	Technical Currency	
Wireless LAN Extension	This business case covers installation of additional wireless access points within the various Integral offices where required. This will provide users the ability to access the LAN while away from their desks but within the depot or major offices at Integral.	The project is to start in FY 2012/13	Cost Effective IT	

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Smart Grid connections to Depots	This project is for the implementation and termination of the planned optical fibre at Depots. It is assumed that the fibre roll out will be funded and implemented by Network Division either the SCADA Group or under Smart Grid	This project will fund the termination to the corporate routers.	Cost Effective IT	
Refresh and licencing of IP Telephony equipment and software	CIC software upgrade and other Minor Software Upgrades to corporate Telephony system to maintain supportability	Assuming that Endeavour Energy does not use AusGrid or Essential Energy Telephony infrastructure and IP Telephony platform will be installed by 2013/14	Technical Currency	
IP Telephony (corporate wide)	This project is to replace the current PABXs with new IP based infrastructure and implementation of new IP phones. This project is dependent on the Data Network refresh and the successful VoIP pilot.	Assuming that Endeavour Energy does not use AusGrid or Essential Energy Telephony infrastructure and the project will start in 2012/13. Some funding will be required in 2013/14	Technical Currency	
Business Continuity in Communication (Voice DR and Fax DR)	This project covers the design and provision of Voice DR and FAX DR.		Cost Effective IT	
Self Service & Automation via IVR (Possibilities: Street Light Out, Hot Water gone cold, Customer Self Meter Read)	This project provides for additional application enhancements to the current IVR systems to provide automated functions. For example, for reporting street light out, hot water gone cold or self-meter reads, etc.		Agility	
Total Estimated Investment Required \$'m				

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APPENDIX E: DEMONSTRATION OF PRIORITISATION

The following table provides a list of all projects put forward for consideration for the 2014/15 capital budget. This follows an 80% capital investment constraint imposed by NNSW for Endeavour Energy. The 80% constrained target was achieved by applying the following steps:

1. Approved projects forecasted to rollover were included in the budget for the forecast rollover value.
2. Revision of project delivery rates within estimation model. This was made possible through negotiation of outsourced contracts for project delivery.
3. Application of prioritisation matrix. Mandatory Projects were automatically included in the program, and remaining projects were scored with a line drawn at the new investment limit. Projects that fell below the line not included in the 2014/15 budget submission.

Program / Project Name	Planned Spend	Mandatory	Business Value	Risk Mitigation	Strategic Fit	Architectural Fit	Change Impact /Implementation Risk	Priority Scoring
		Y/N	30% ROI 1-3 years = 2 ROI 3-5 years = 1 ROI >5 years = 0	25% Extreme = 3 High = 2 Medium = 1 Low = 0	25% >2 objectives = 2 1-2 objectives = 1 0 objectives = 0	10% High = 2 Medium = 1 Low = 0	10% High = 0 Medium = 1 Low = 2	
Migrate remaining CPM functions to MBS		Y	2	2	2	2	2	2
Migrate to AG MVRS		Y	2	2	2	2	2	2
MMO: Migrate Meter Asset Management to MBS		Y	2	2	2	2	2	2
Street Light Billing Regulatory Enhancements		Y	2	2	2	2	2	2
AP Automation - Phase 2		N	2	1	1	2	1	1.4
Online Timesheets		N	2	1	1	2	1	1.4
Service Line Inspection Mobile Solution - Phase 2 (Productionise & Transition to Support or provide alternate solution)		N	1	1	2	2	1	1.35
FFA for Service Line Repairs		N	1	1	2	2	1	1.35
Web Extranet Capability (including Security)		N	1	1	2	2	1	1.35
ESS / MSS		N	1	2	1	2	1	1.35
Workforce Scheduling (Phase 2)		N	2	1	1	2	0	1.3

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Field Force Automation		N	1	1	2	1	1	1.25
Mobility Platform & Devices		N	1	1	2	1	1	1.25
Supplier and Contract Lifecycle - Phase 2		N	1	1	2	1	1	1.25
Network Billing System Regulatory Compliance Enhancements		Y	0	2	2	1	1	1.2
Document Approval workflow and approval configuration		N	1	1	1	2	2	1.2
ICT Comms Infrastructure		N	0	2	1	2	2	1.15
DC Refresh - 3 - Virtualization Roadmap		N	0	2	1	2	2	1.15
DC Refresh - 4 - Storage and Backup		N	0	2	1	2	2	1.15
DC Refresh - 5 - Data Centre Environment Assessment		N	0	2	1	2	2	1.15
VM Renewal		N	0	2	1	2	2	1.15
Desktop Platform		N	0	2	1	2	2	1.15

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DR Capability Enhancement program	N	0	2	1	2	2	1.15
E-Docs to Content Server migration	N	1	1	1	2	1	1.1
Shift Rostering	N	1	1	1	1	2	1.1
IP Telephony Replacement and Enhancement PSR92586	N	0	2	1	2	1	1.05
WAN Equipment Refresh	N	0	2	1	2	1	1.05
Oracle Consolidation	N	0	2	1	2	1	1.05
nemSTAR Virtualisation	N	0	2	1	1	2	1.05
Licence Management	N	0	2	1	1	2	1.05
DC Refresh - 6 - Security and Others	N	0	2	1	2	1	1.05
DC Refresh - 7 - Enterprise Monitoring	N	0	2	1	2	1	1.05
IM Program - Drawings Management Ph1	N	1	1	1	1	1	1
Figtree Technical Upgrade	N	1	1	1	1	1	1
Workers Compensation Improvements	N	1	1	1	1	1	1
IDM Phase 3	N	1	1	1	1	1	1
Call Centre	N	0	2	1	1	1	0.95
FFA and Mobility infrastructure	N	0	1	2	1	1	0.95
Request IT / Switch IT FFA Enhancements	N	0	1	2	1	1	0.95
LAN /WAN Diagnostic Tool	N	0	2	1	1	1	0.95
Supplier and Contract Lifecycle - Phase 1	N	0	1	2	1	1	0.95

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Intrusion Prevention and Detection		N	0	2	1	1	1	0.95
Security Program - ACS Replacement		N	0	2	1	1	1	0.95
Network System Enhancements - small initiatives - CAD		N	0	1	1	2	2	0.9
Network System Enhancements - small initiatives - Ellipse		N	0	1	1	2	2	0.9
Network System Enhancements - small initiatives - FIS		N	0	1	1	2	2	0.9
Network System Enhancements - small initiatives - GIS		N	0	1	1	2	2	0.9
Network System Enhancements - small initiatives - OMS		N	0	1	1	2	2	0.9
Network System Enhancements - small initiatives - PPMS		N	0	1	1	2	2	0.9
Network System Enhancements - small initiatives - CAMS		N	0	1	1	2	2	0.9
Others <\$25K		N	0	1	1	2	2	0.9
NAAS Upgrade and Enhancements		N	0	1	1	2	2	0.9
Wireless LAN Extension		N	0	1	1	2	2	0.9
Depot File Print Services Enhancements		N	0	1	1	2	2	0.9
Performance Management		N	1	0	1	1	2	0.85
iServer process Improvement		N	0	1	1	1	2	0.8
Perfect Lite Upgrade		N	0	1	1	1	2	0.8
pdfDocs defect release implementation		N	0	1	1	1	2	0.8
Web Internet Platform Upgrade and Enhancement project		N	0	1	1	1	2	0.8

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Transmission Maintain Technical Currency		N	0	1	1	1	2	0.8
Works Management System Technical Currency		N	0	1	1	1	2	0.8
BI / TM1 Upgrade		N	0	1	1	1	2	0.8
Cognos 10 Upgrade		N	0	1	1	1	2	0.8
ETL & DWH Upgrade		N	0	1	1	1	2	0.8
MySafe Reporting		N	0	1	1	1	2	0.8
Market Testing - interface to/from OMS, Banner or Ellipse		N	0	1	1	2	1	0.8
FSOP - Field Service Order Processing - Phase 2		N	1	0	1	1	1	0.75
Meter Issuing		N	0	1	1	1	1	0.7
Lifecycle Management		N	0	1	1	1	1	0.7
Safety System Upgrade and Enhancements		N	0	1	1	1	1	0.7

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Safety Training		N	0	1	1	1	1	0.7
Smart Grid Analytics and Forecasting		N	0	0	2	1	1	0.7
Intranet Portal For Employees		N	0	0	2	1	1	0.7
EPB - HV Production Implementation		N	0	0	2	1	1	0.7
LIDAR mapping system (for 3D mapping of O/H Network to assist with Veg Mgt) - Phase 1: BRS, Market Analysis/EIO		N	0	1	1	1	1	0.7
NAAS (Authorisation Management System Upgrade) Version 4 (Self-Service Enhancements)		N	0	1	1	1	1	0.7
Replace Network Data Store		N	0	1	1	1	1	0.7
Poles n Wires Upgrade		N	0	1	1	0	1	0.6
DINIS RDB Enhancements (Distribution)		N	0	1	1	0	1	0.6

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DINIS RDB Phase 2		N	0	1	1	0	1	0.6
CAMS Enhancements		N	0	0	1	2	1	0.55
CAMS 2.0 - Priority Enhancements		N	0	0	1	2	1	0.55
E-Recruitment Process and system enhancements		N	0	0	1	1	2	0.55
Primavera - Process improvements		N	0	0	1	1	2	0.55
Business Reporting Program		N	0	0	1	1	2	0.55
New EAI Interface Development		N	0	0	1	1	2	0.55
Composite Application Development		N	0	0	1	1	2	0.55
LMS Process Enhancements and Online Training & Support Modules		N	0	0	1	1	1	0.45
ASP Website		N	0	0	1	1	1	0.45
PPMS Enhancements		N	0	0	1	1	1	0.45

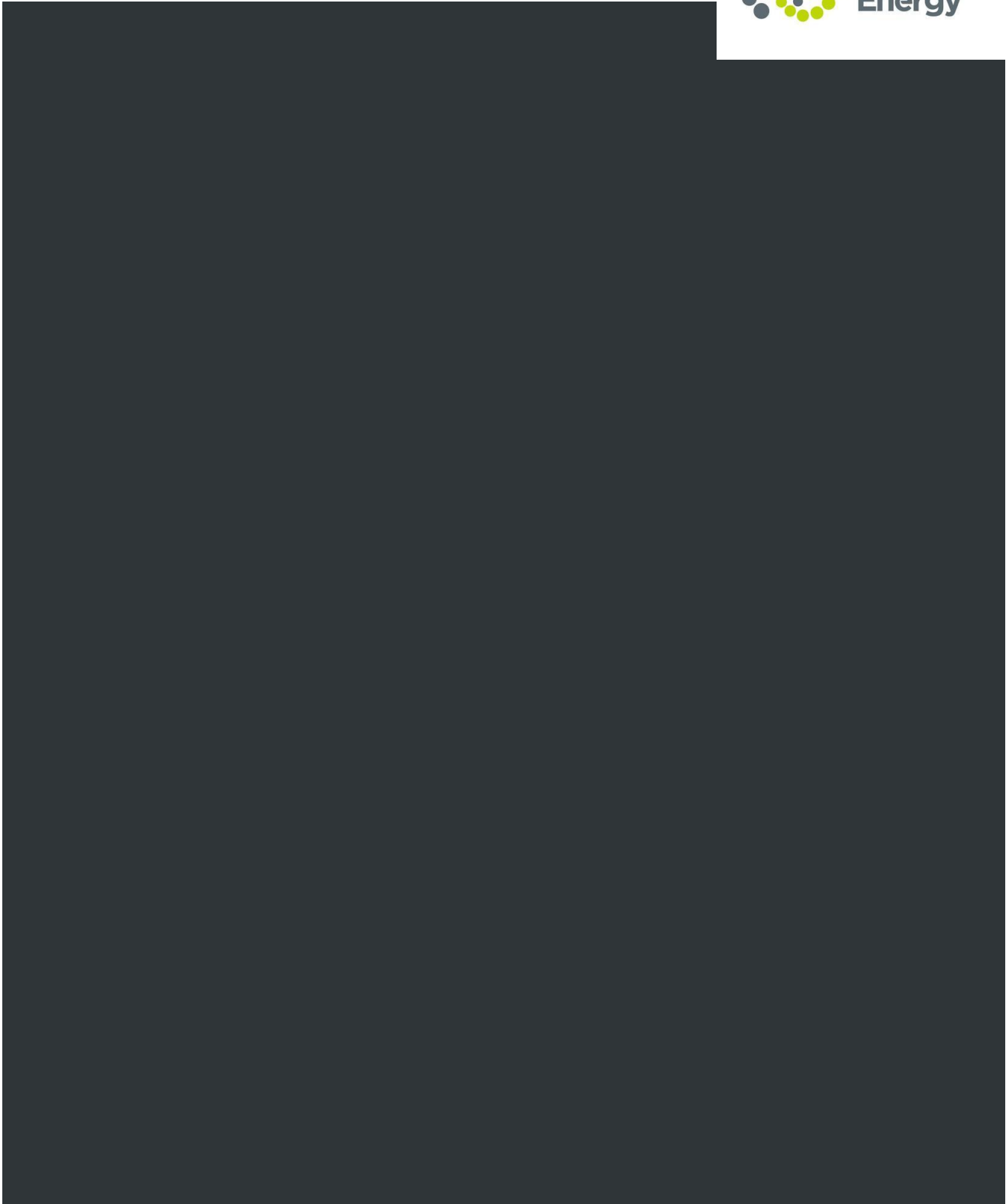
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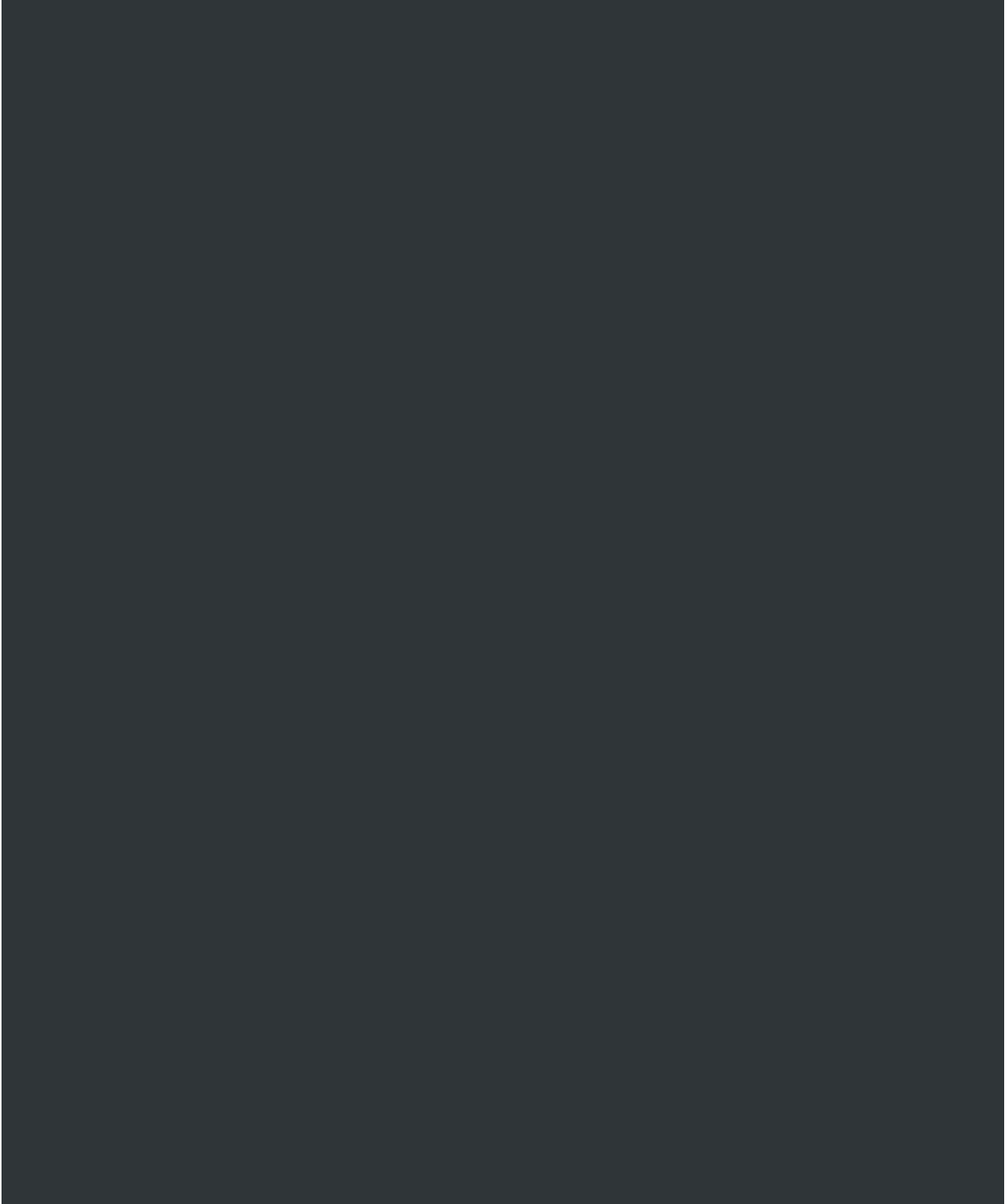
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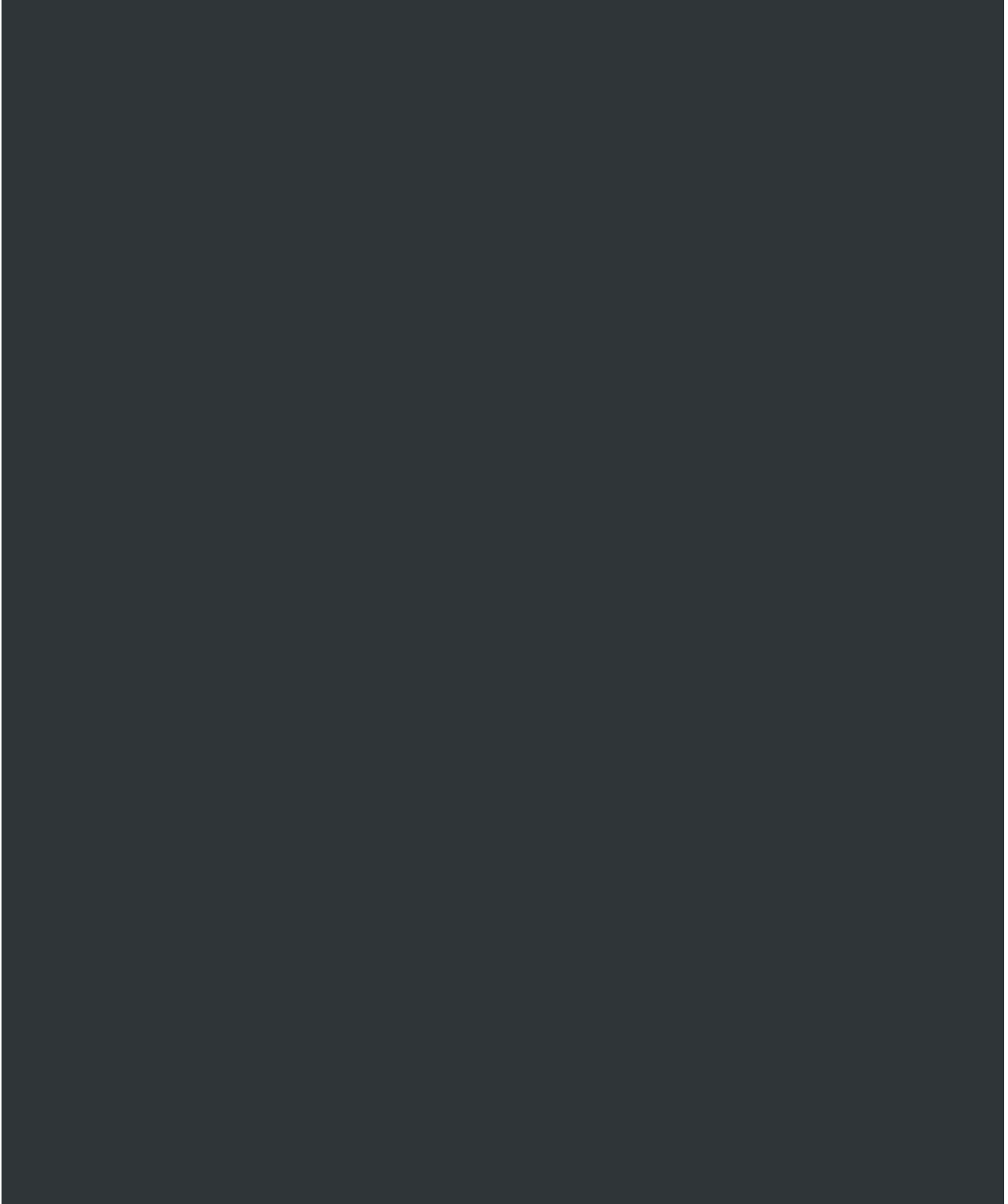
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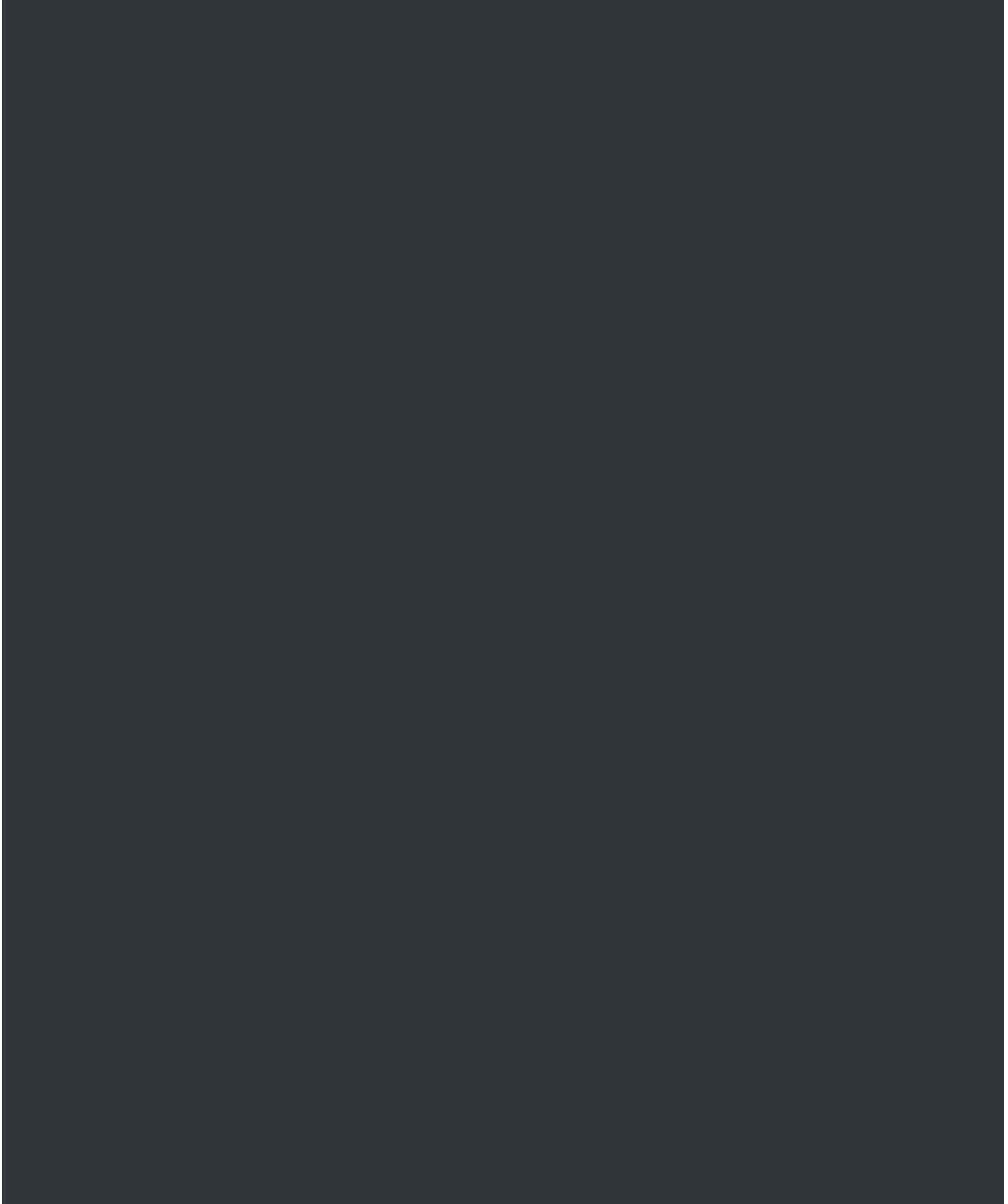
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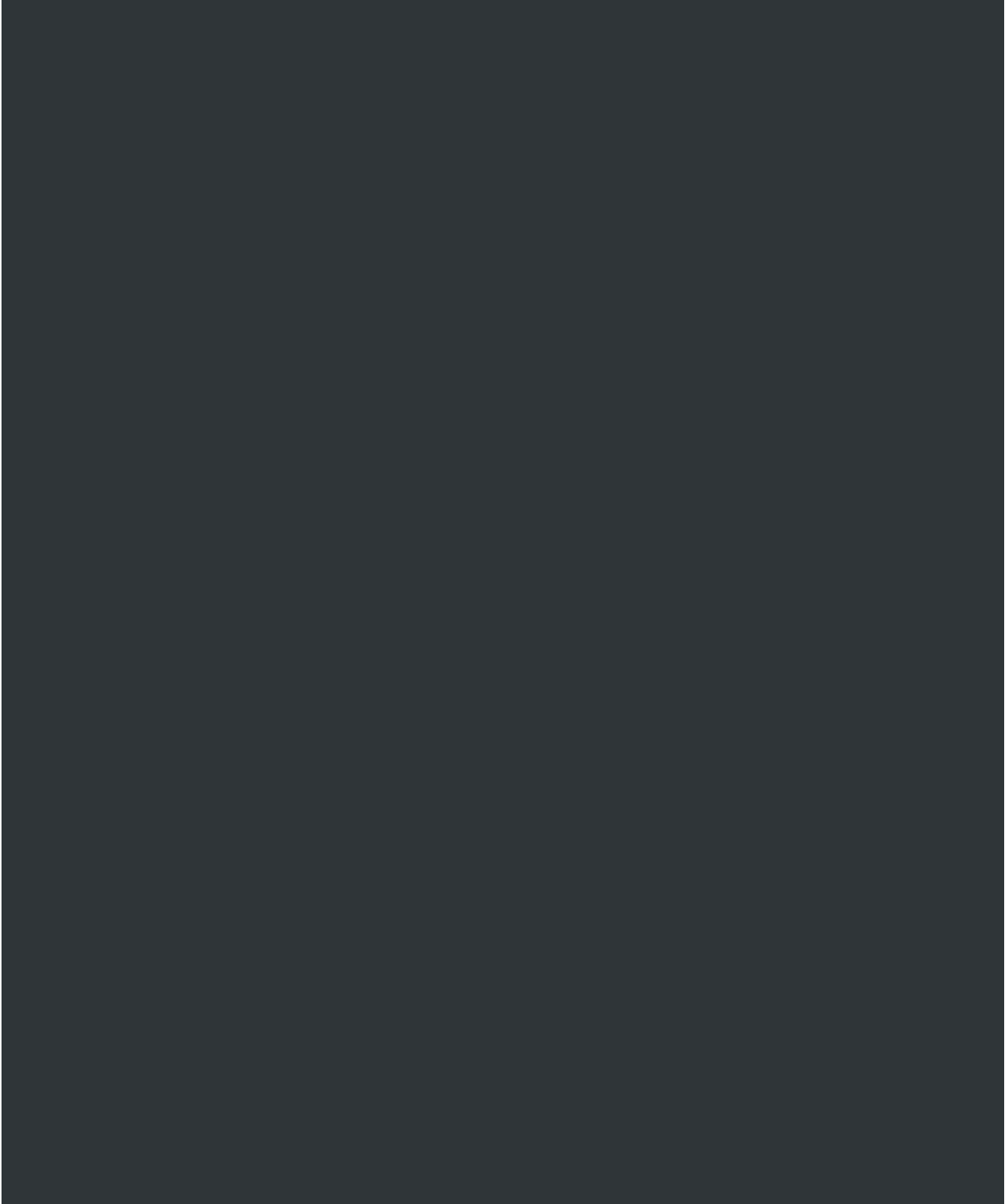
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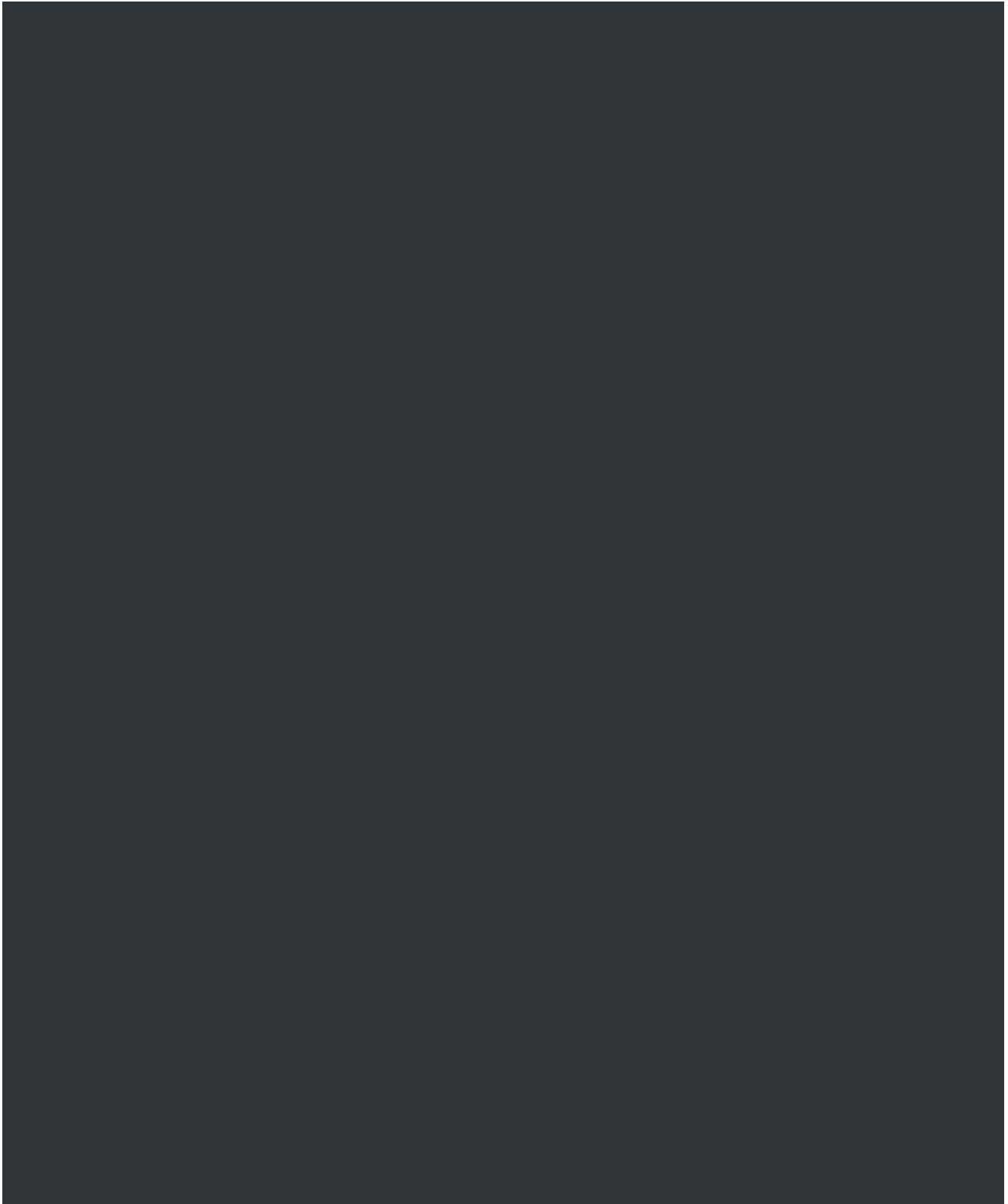
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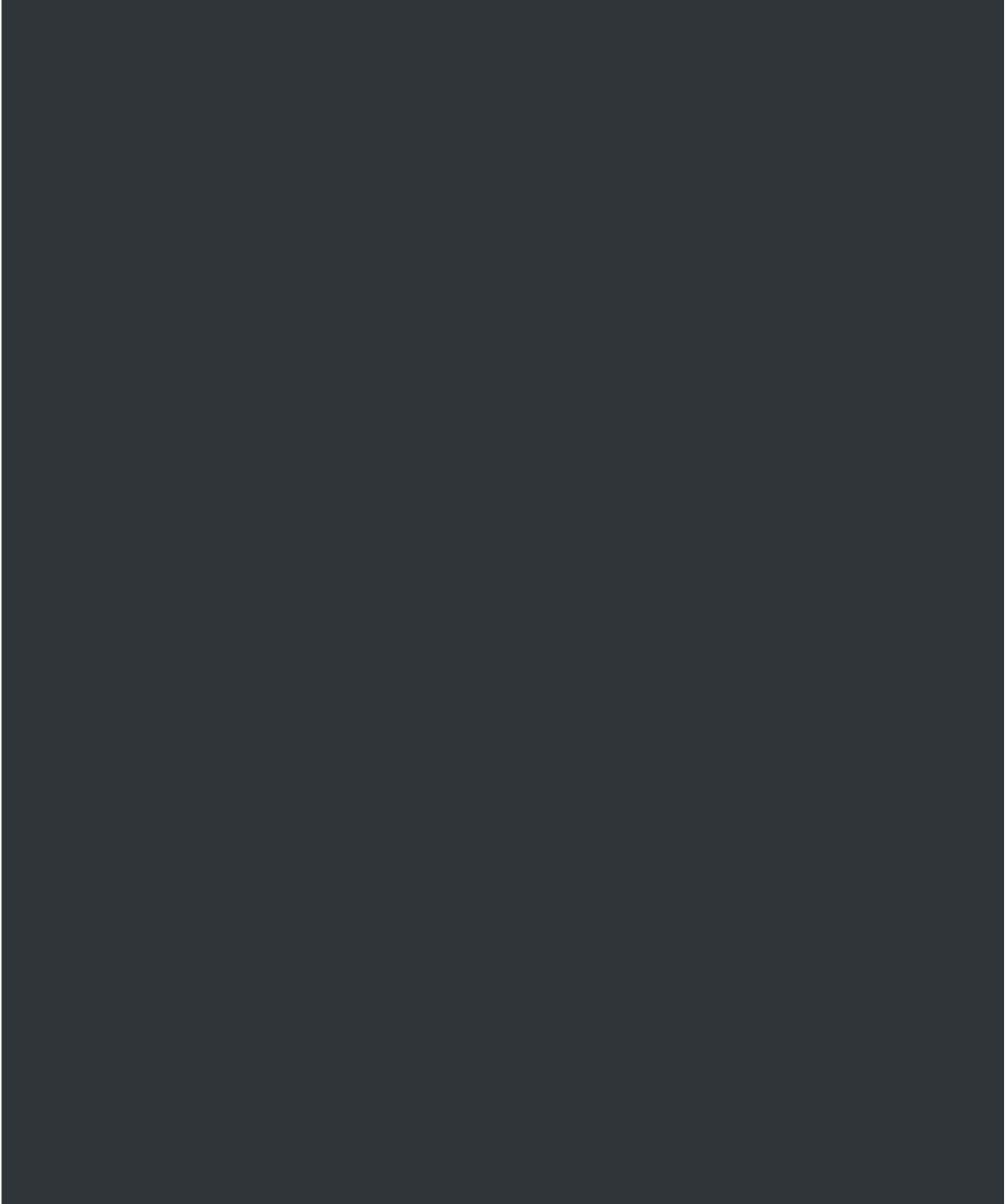
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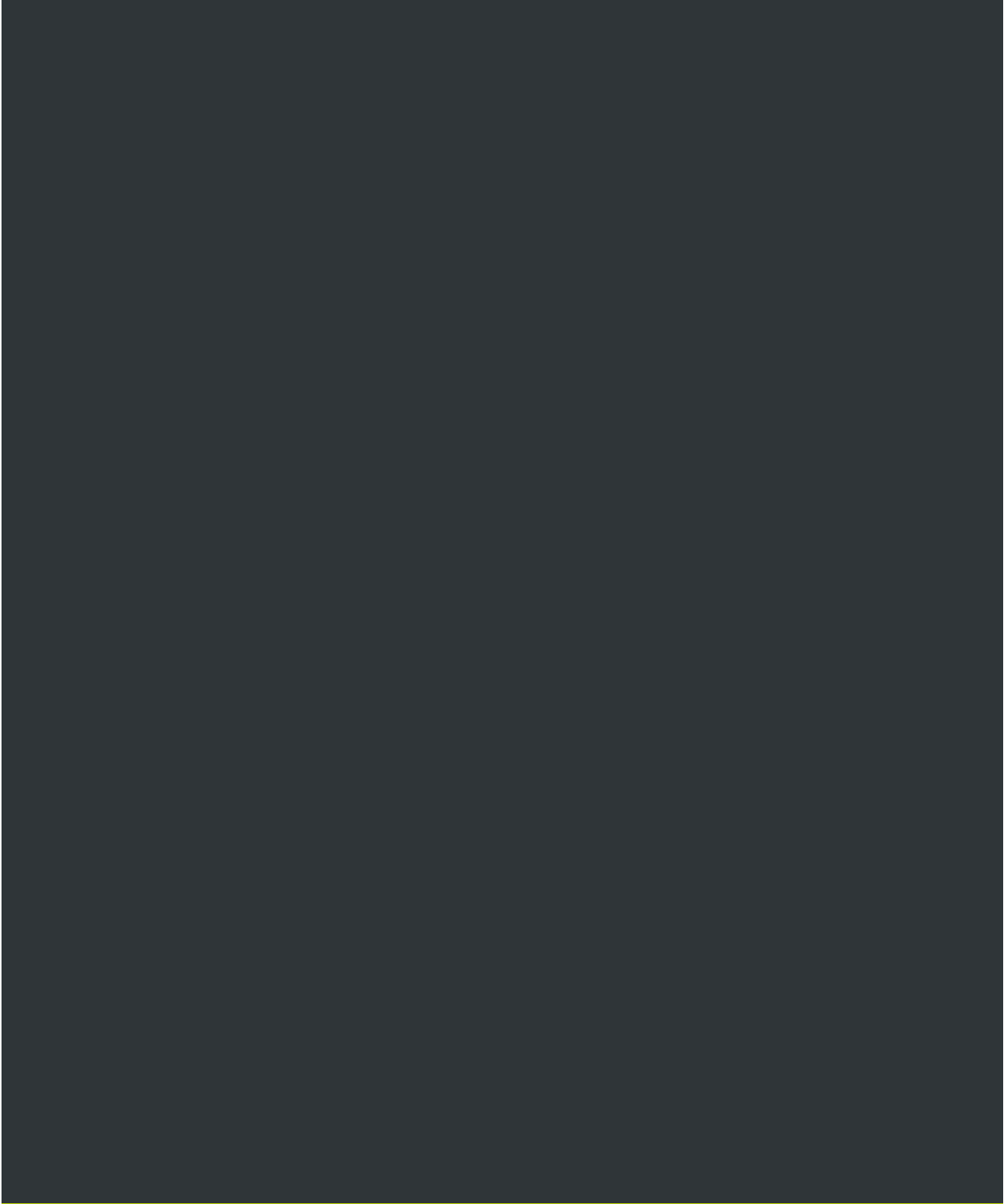
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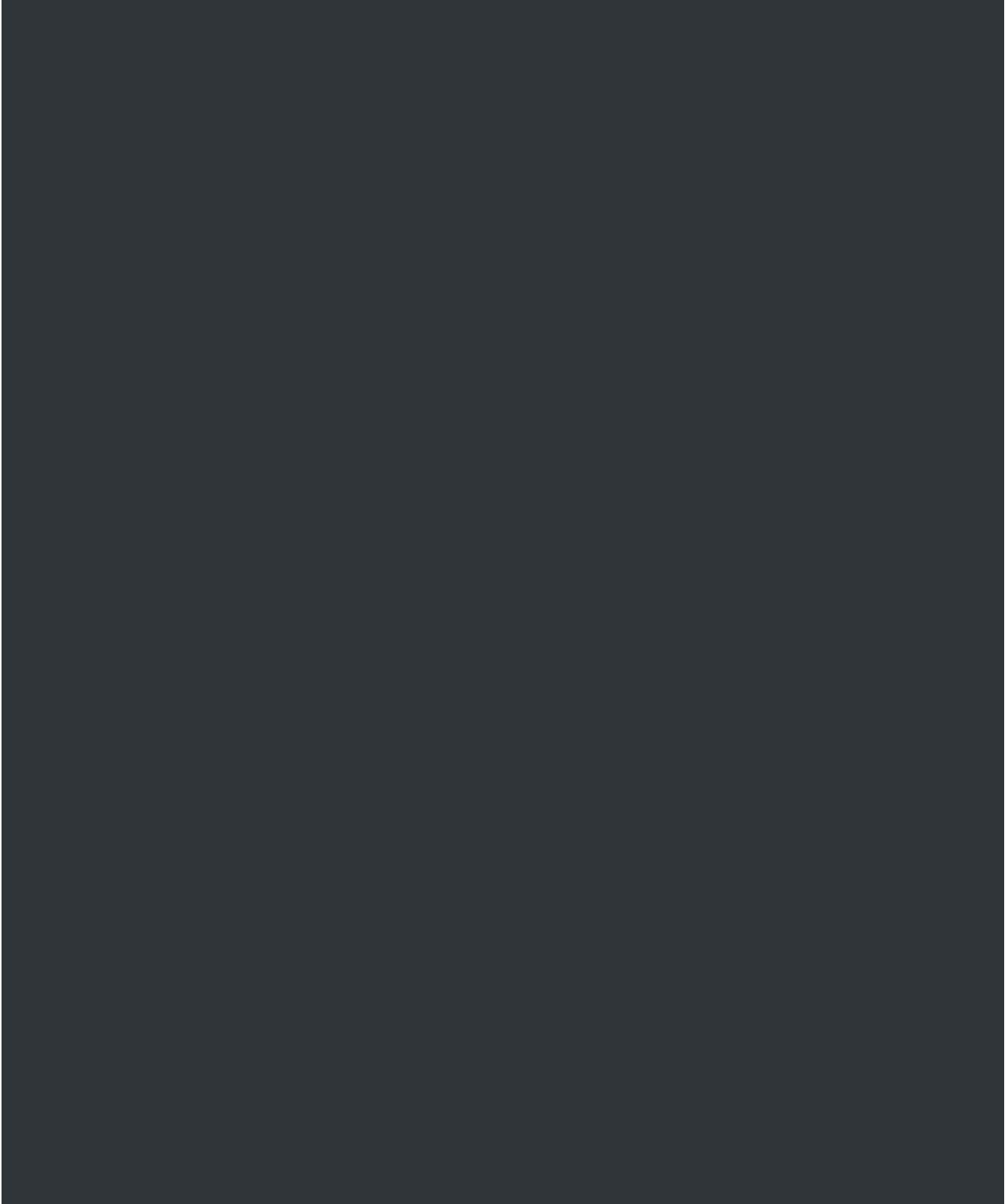
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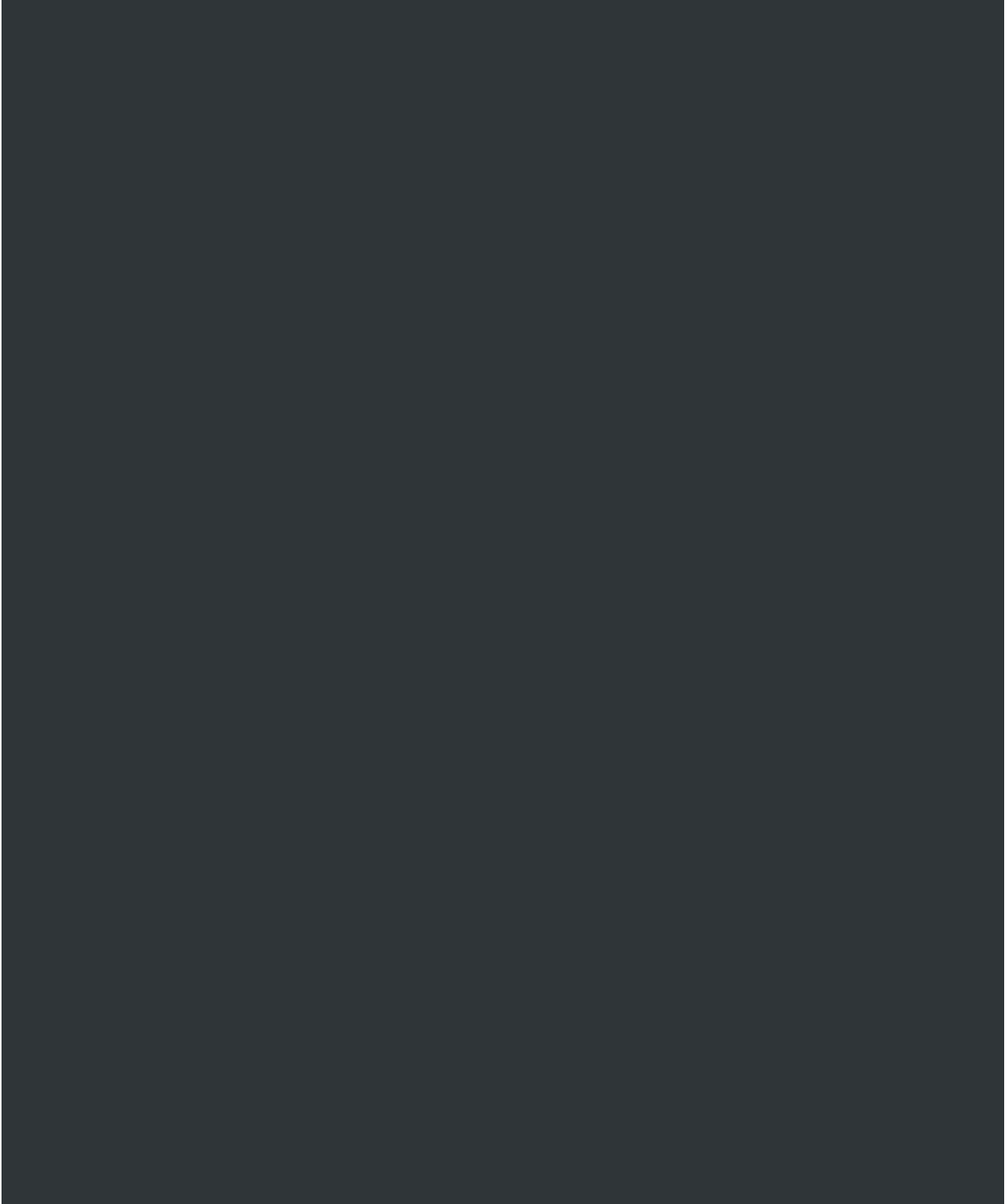
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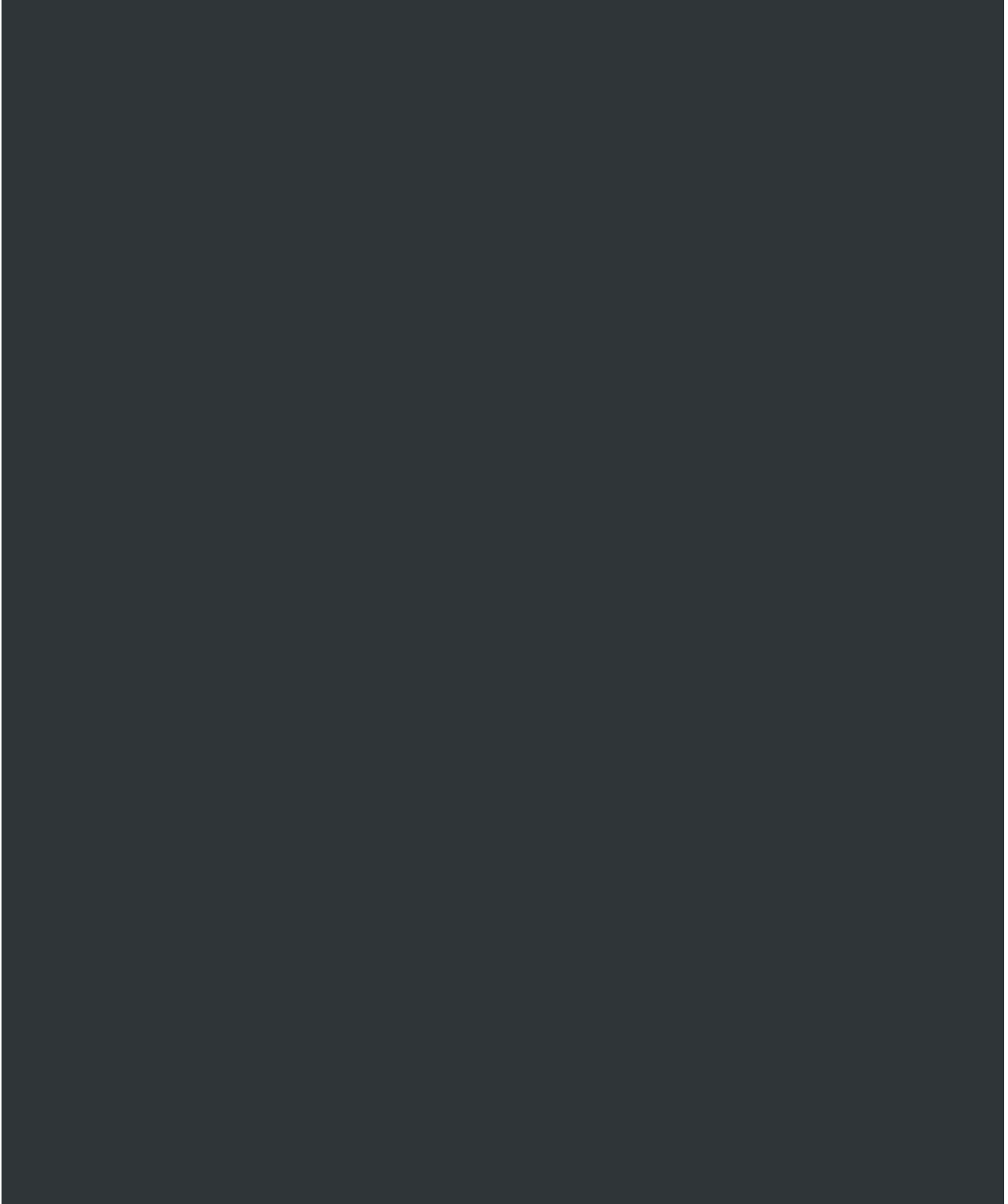
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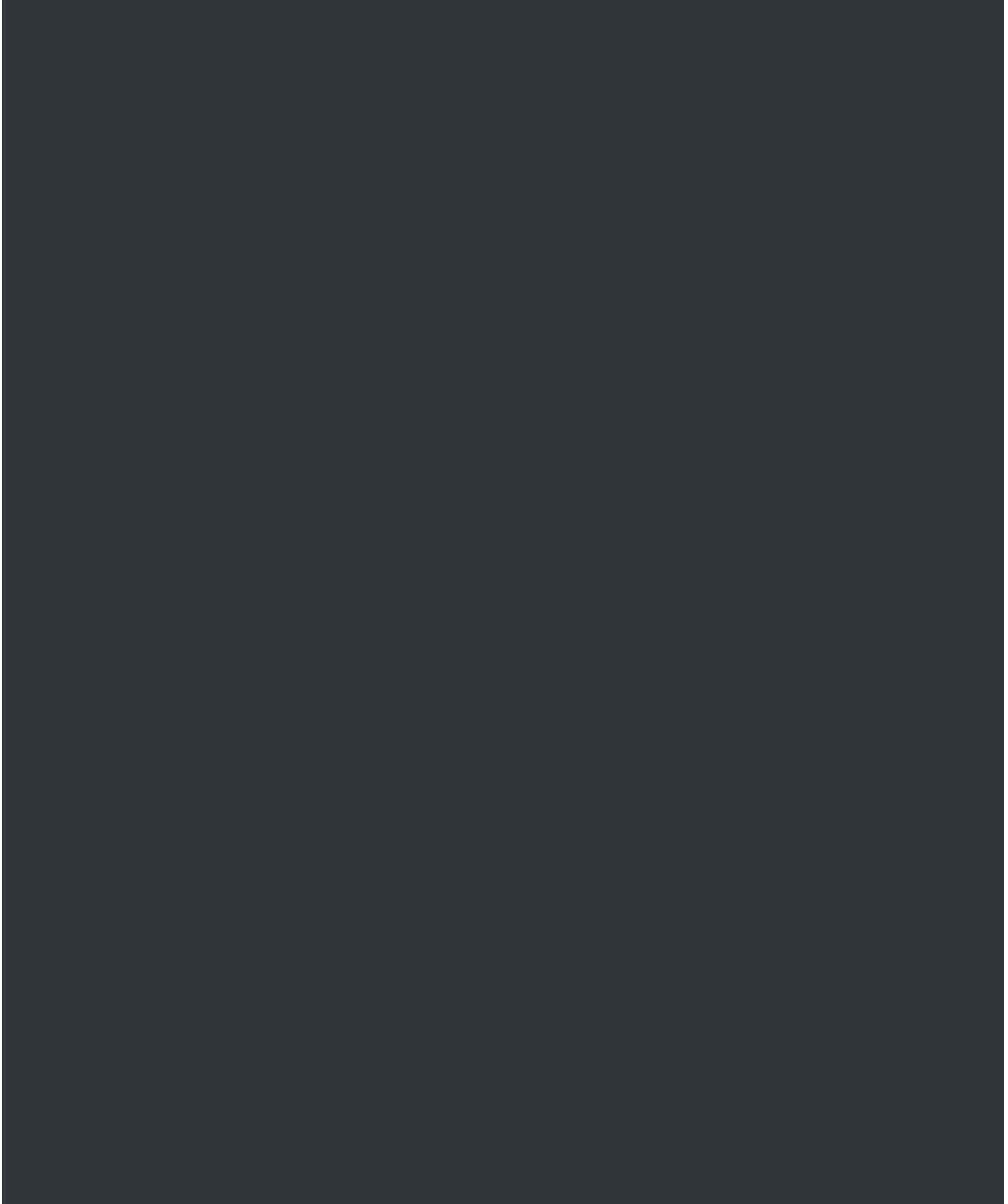
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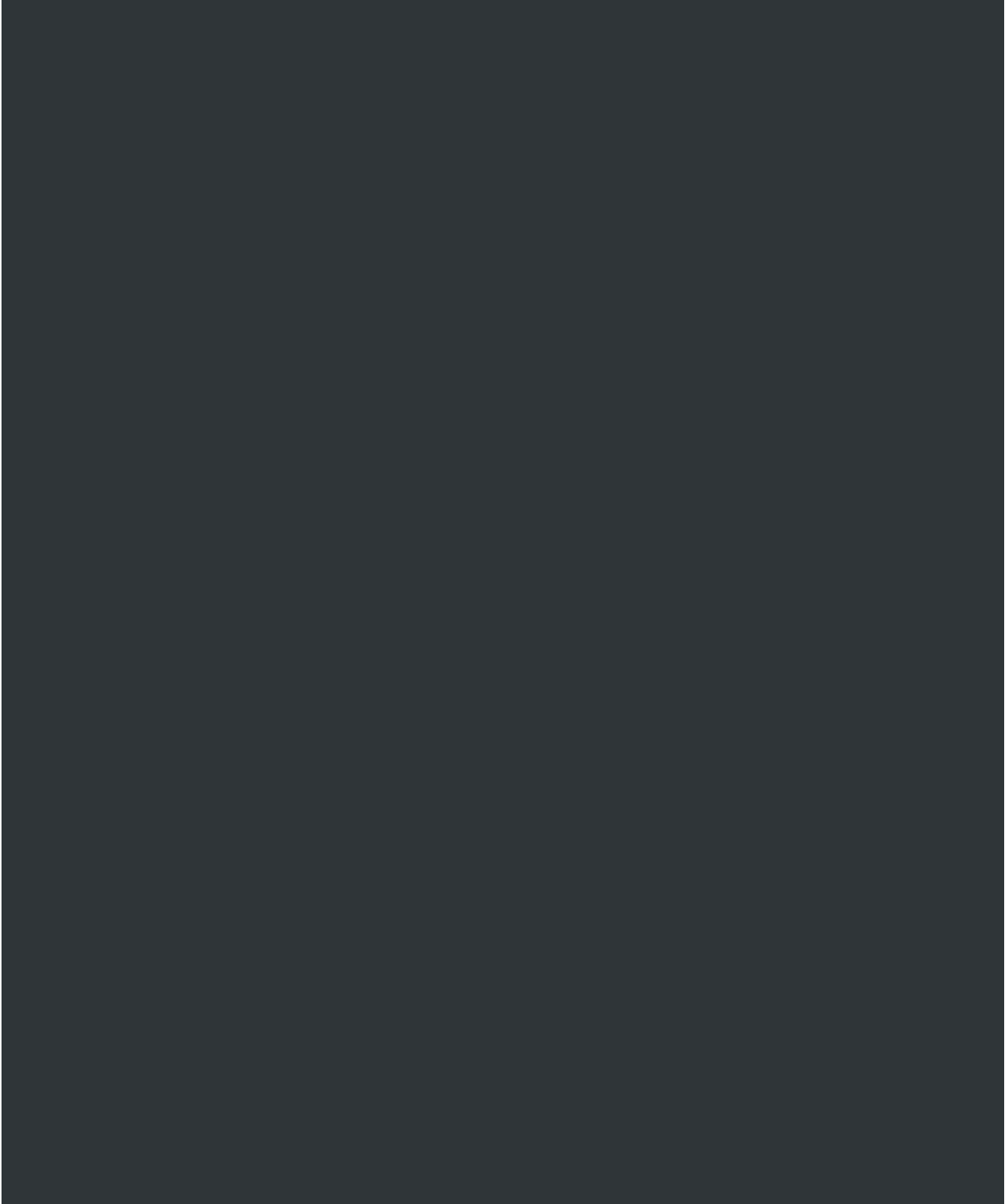
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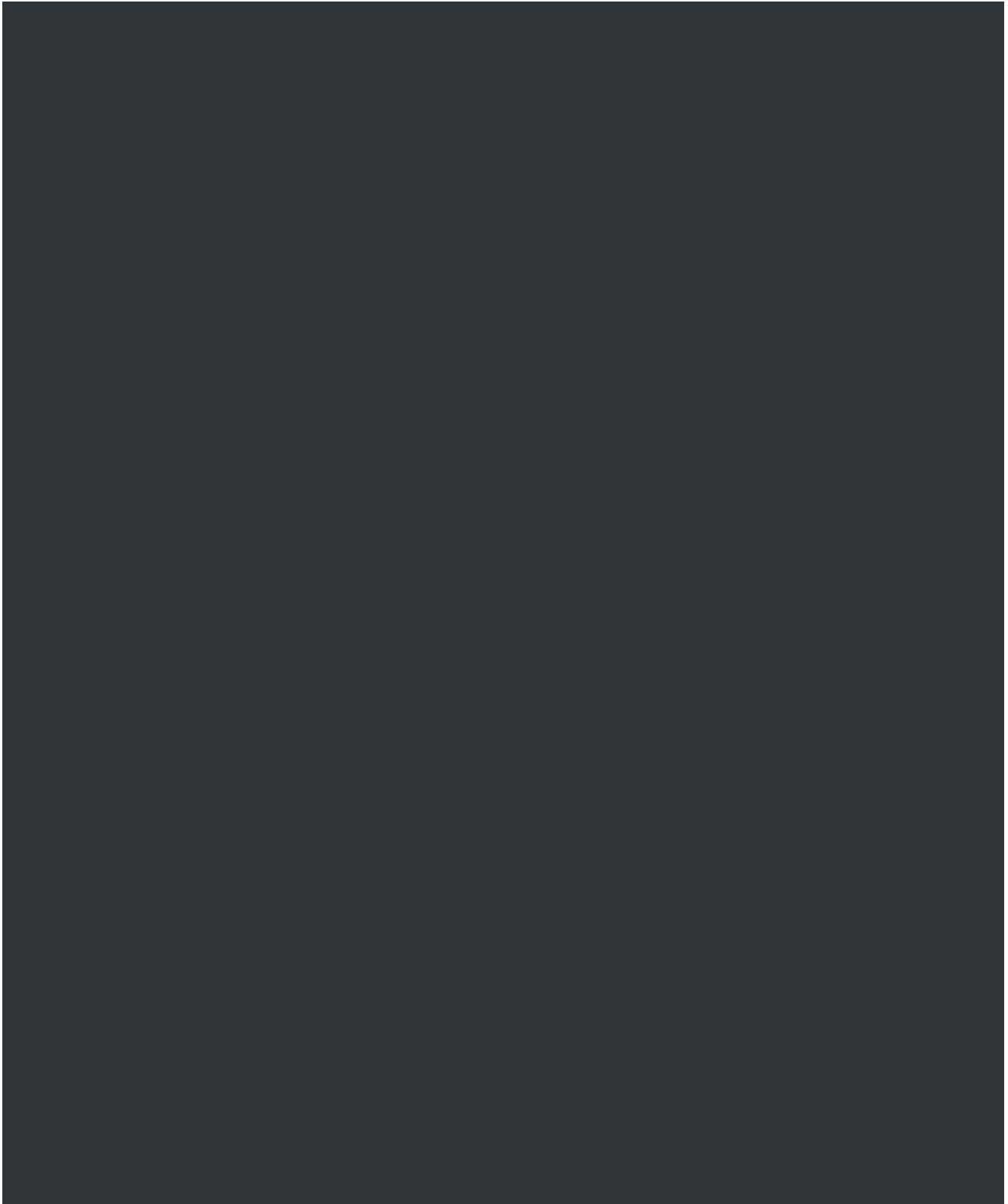
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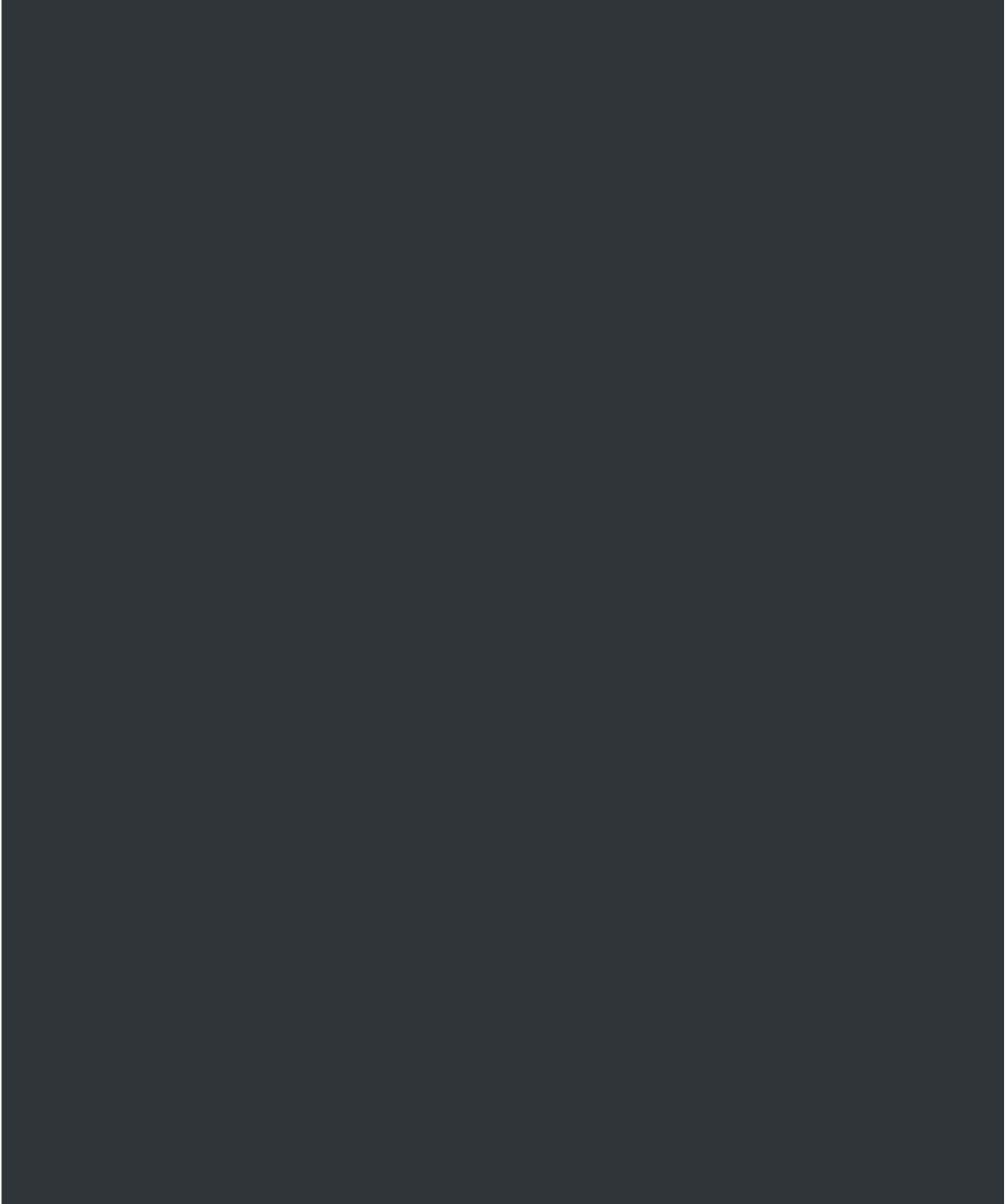
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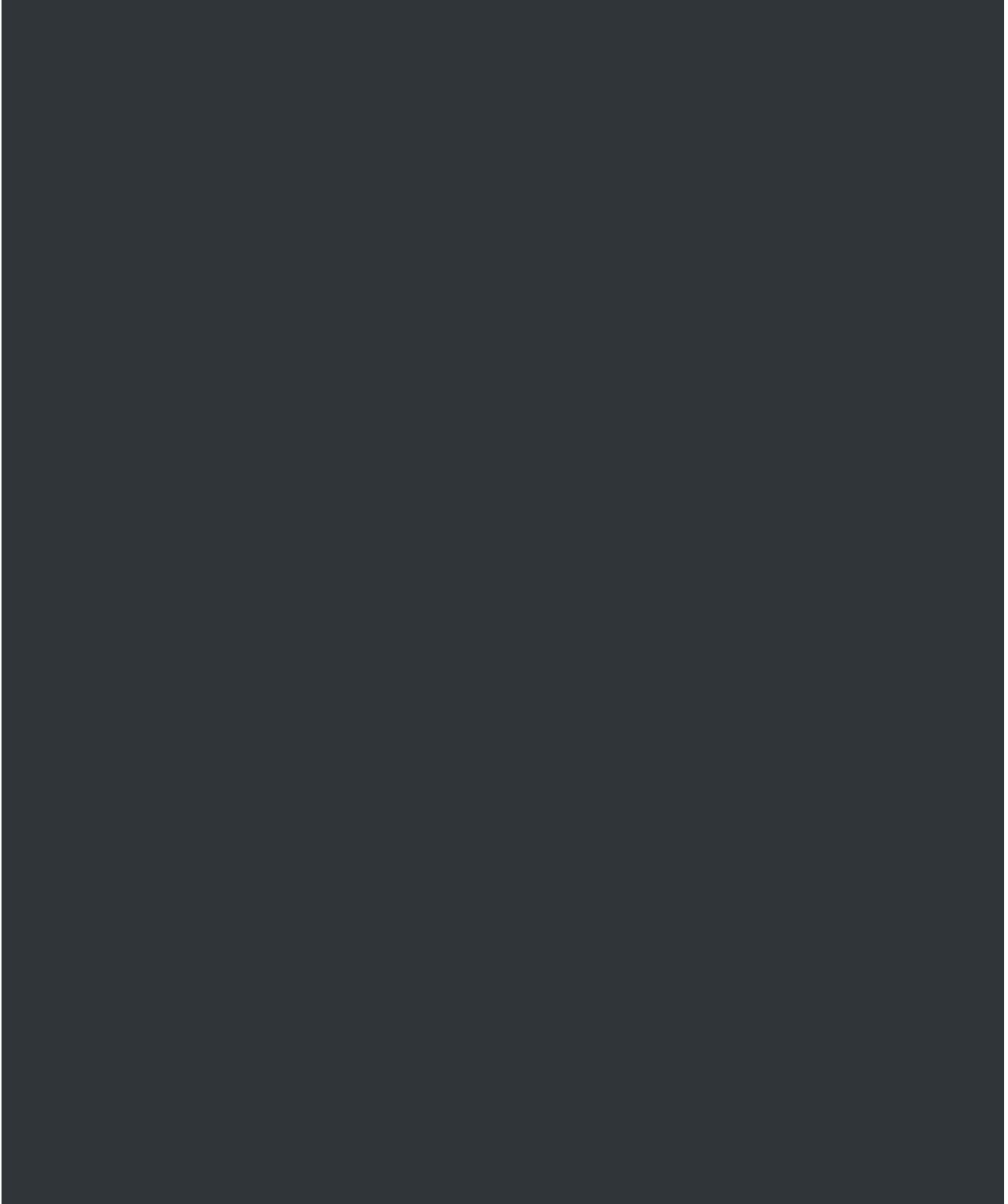
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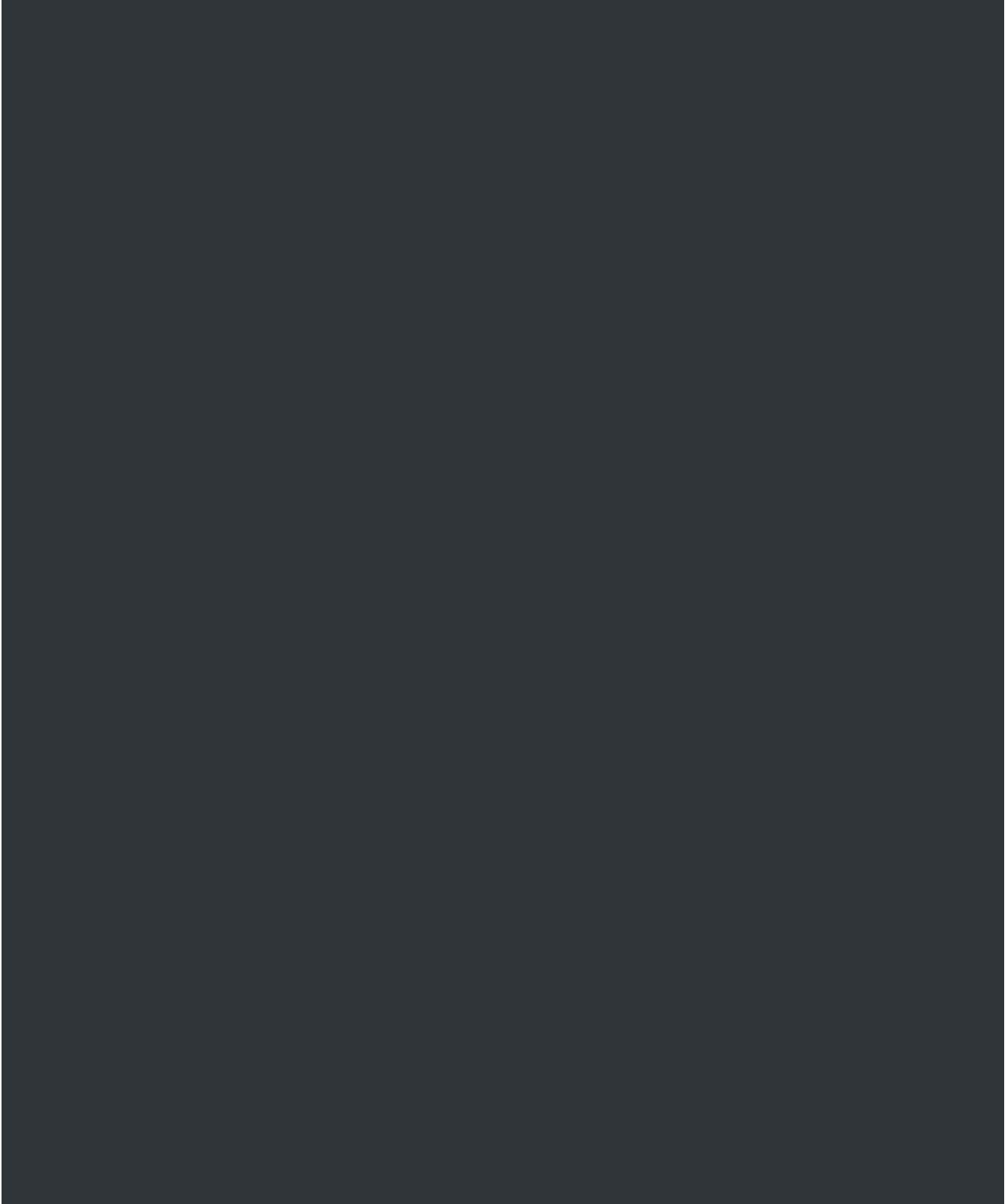
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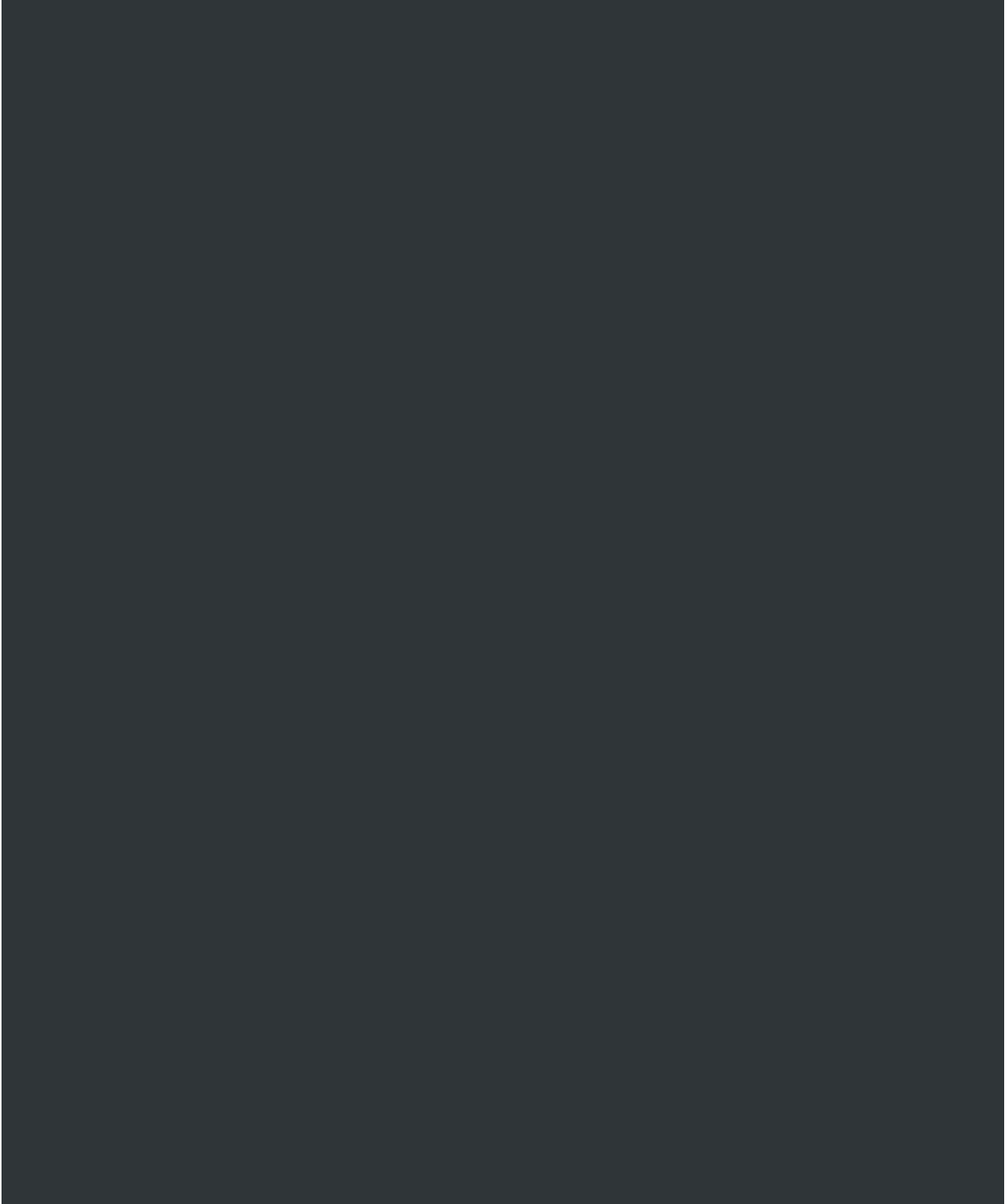
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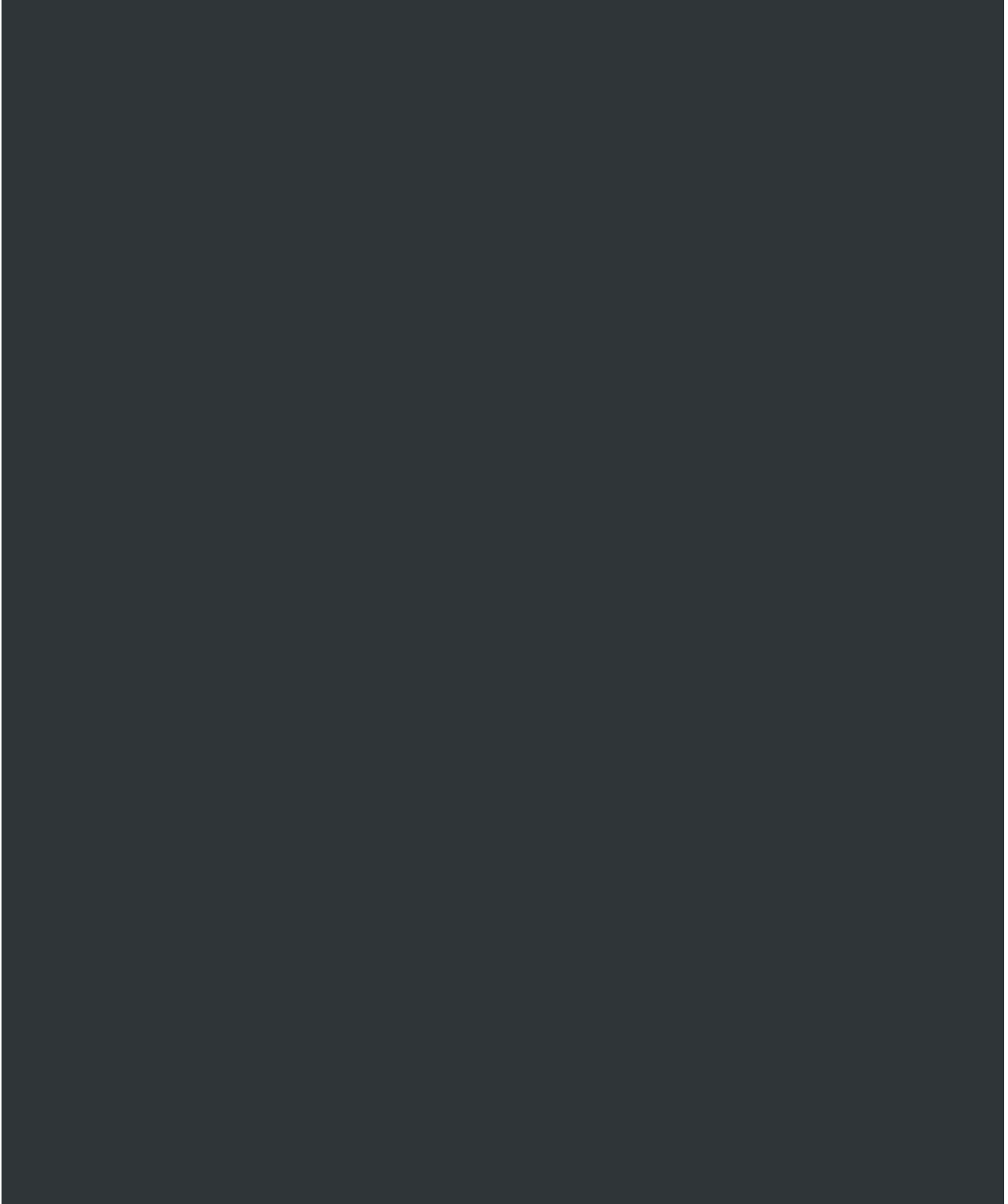
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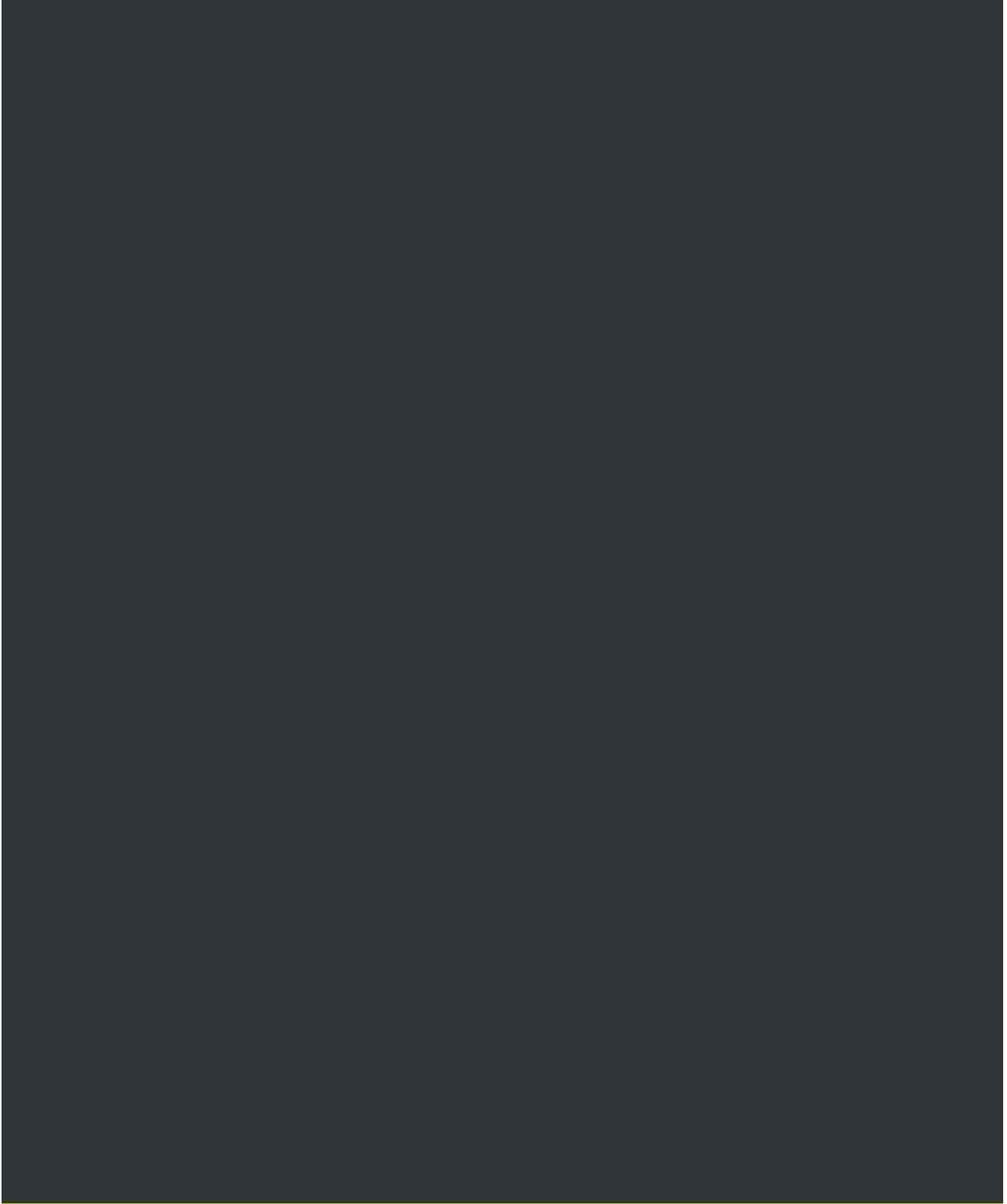
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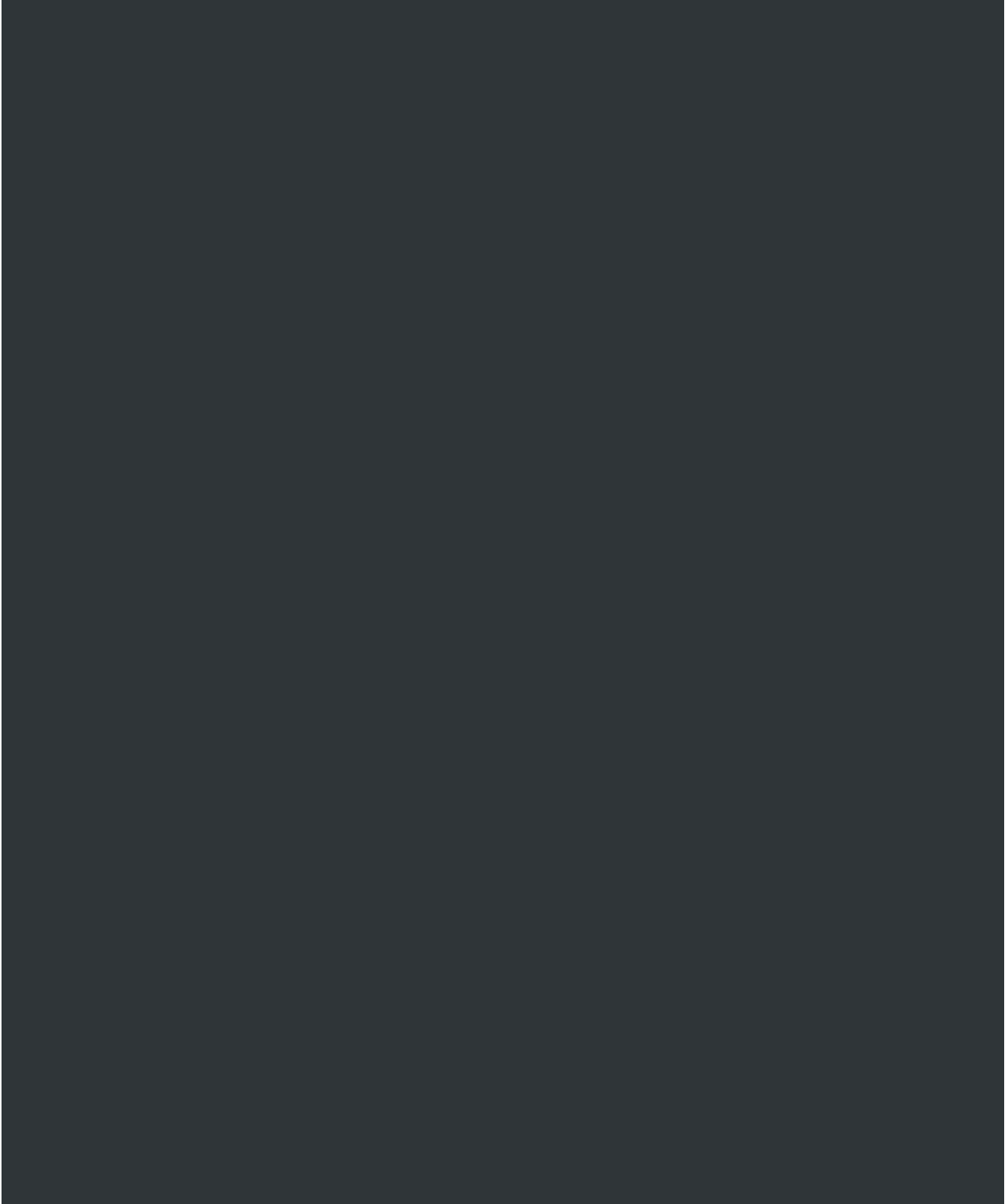
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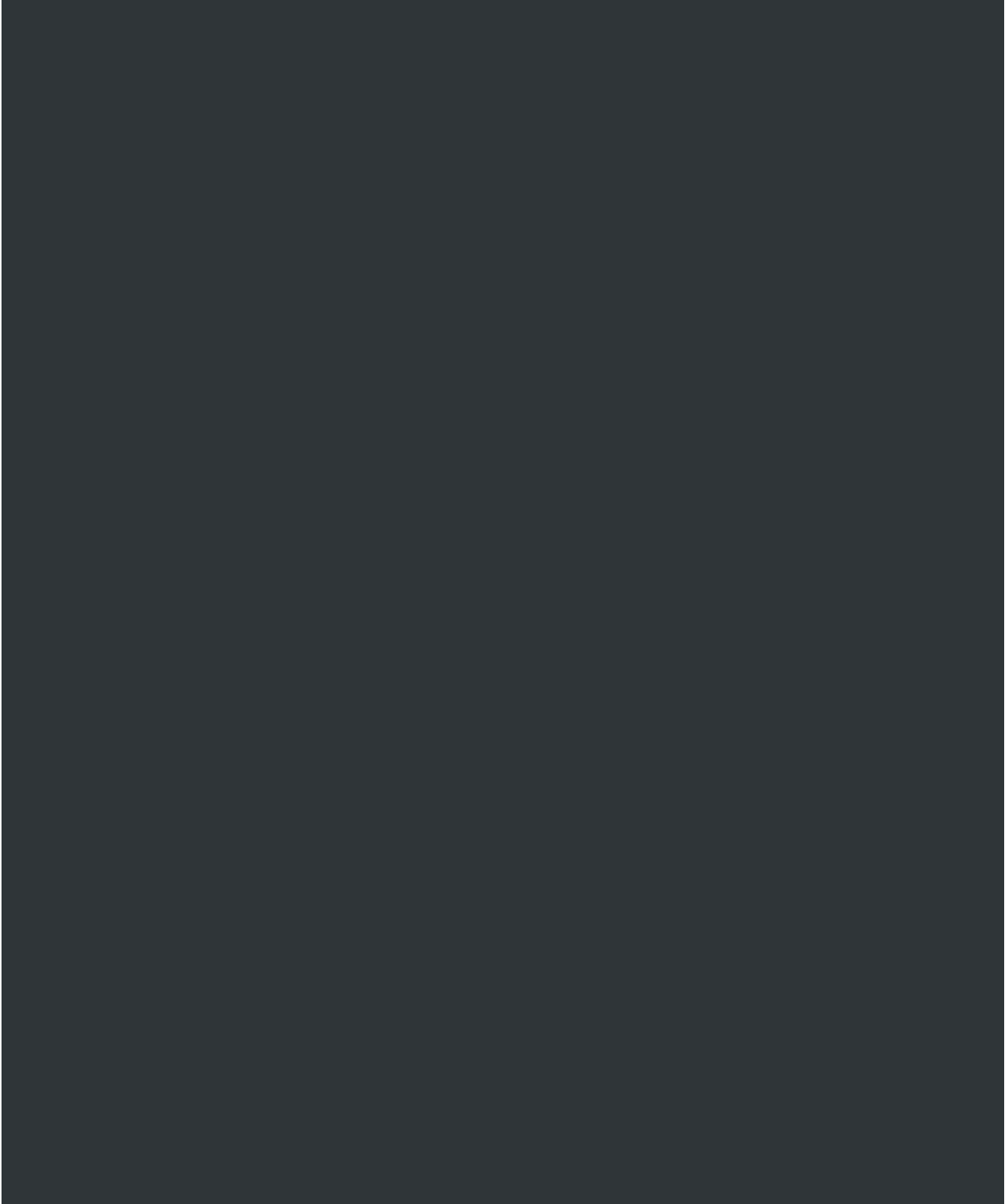
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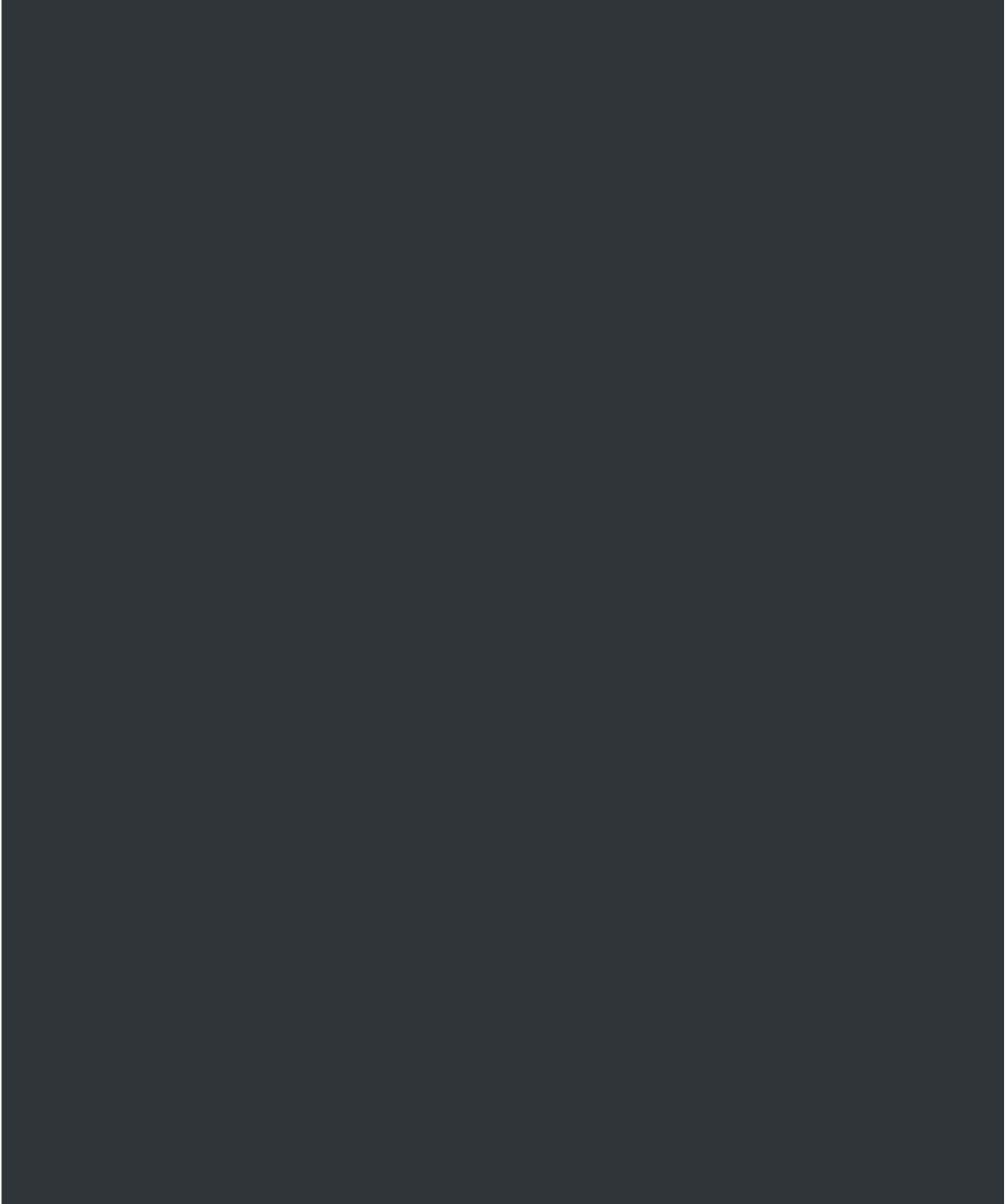
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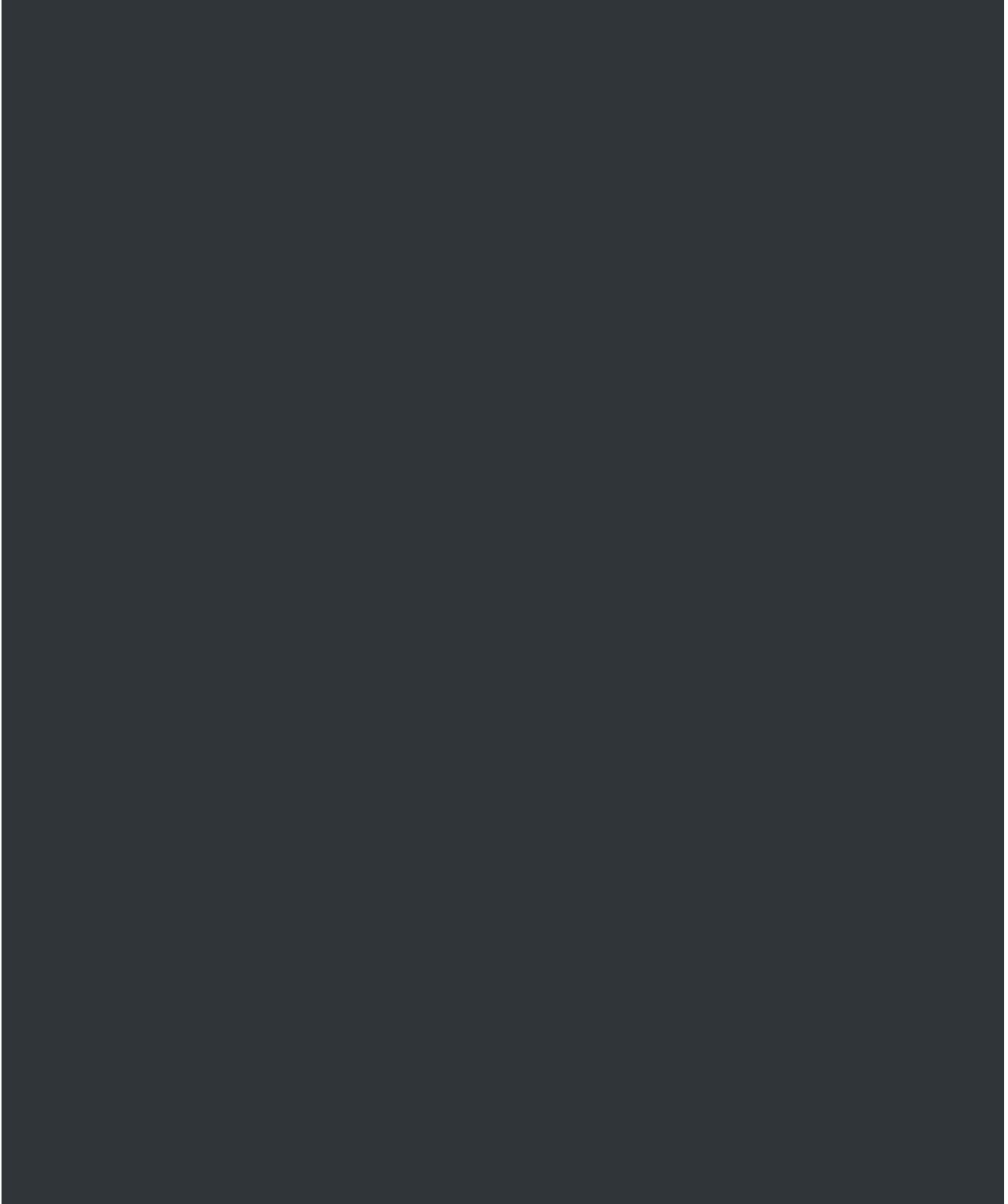
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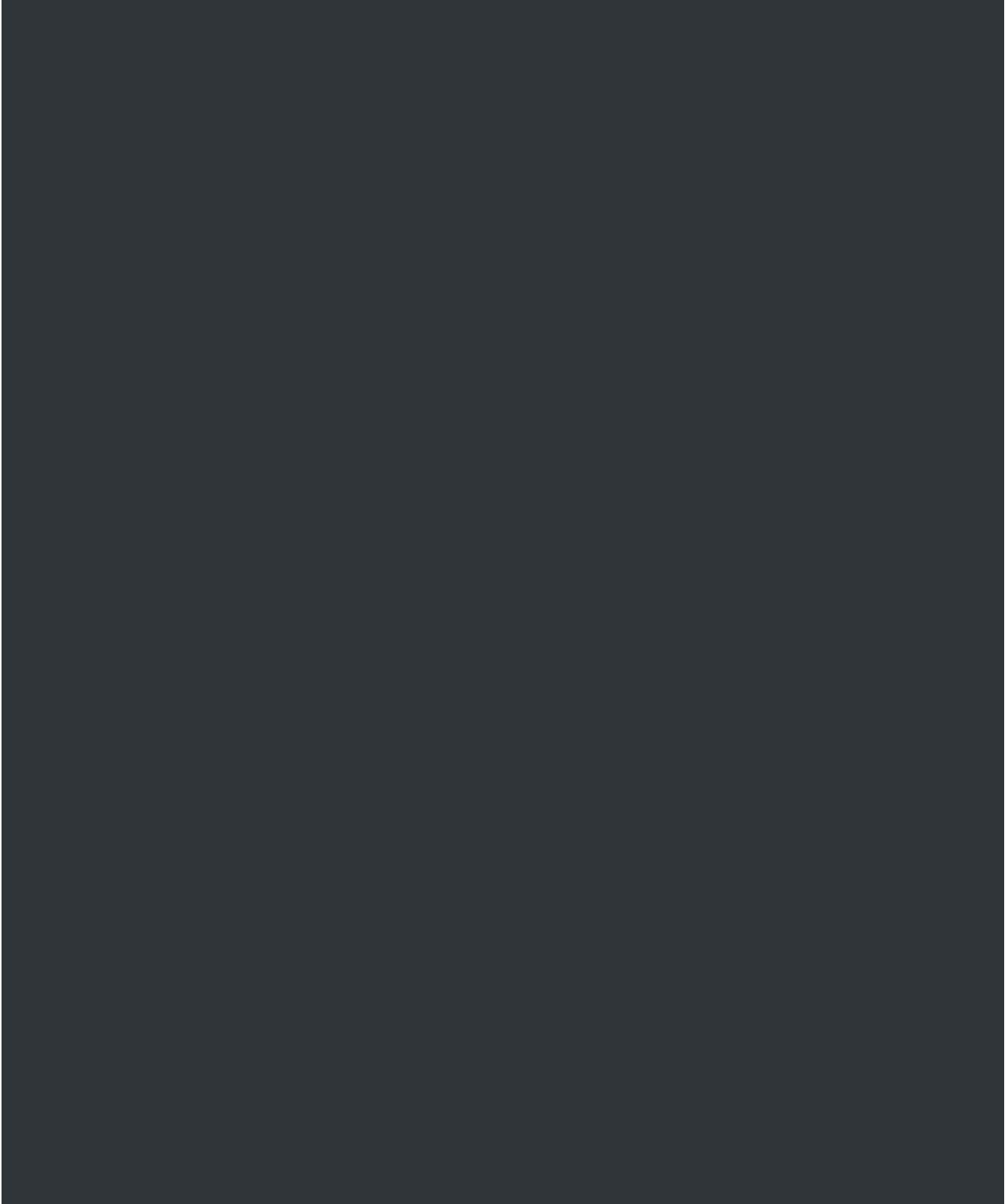
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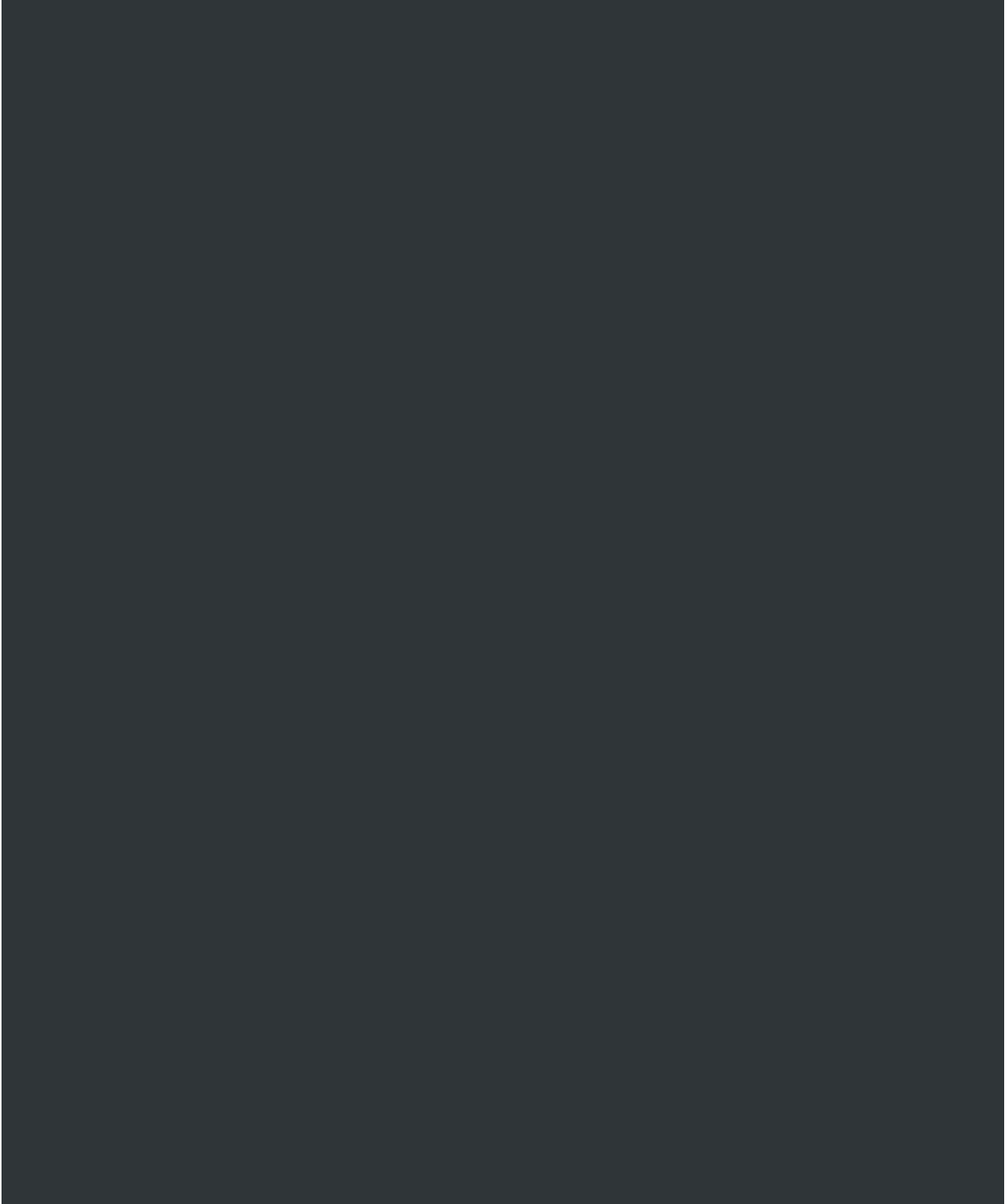
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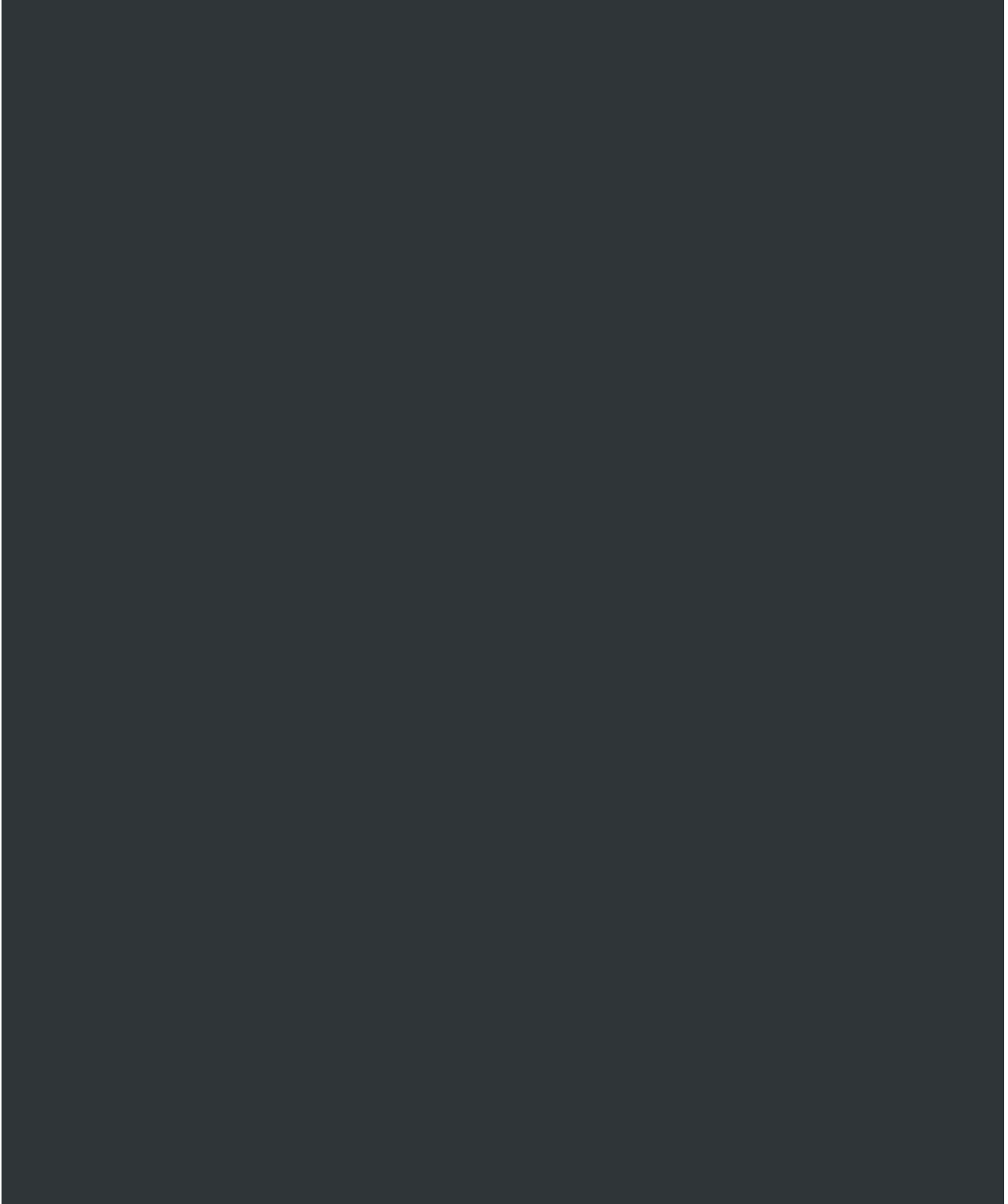
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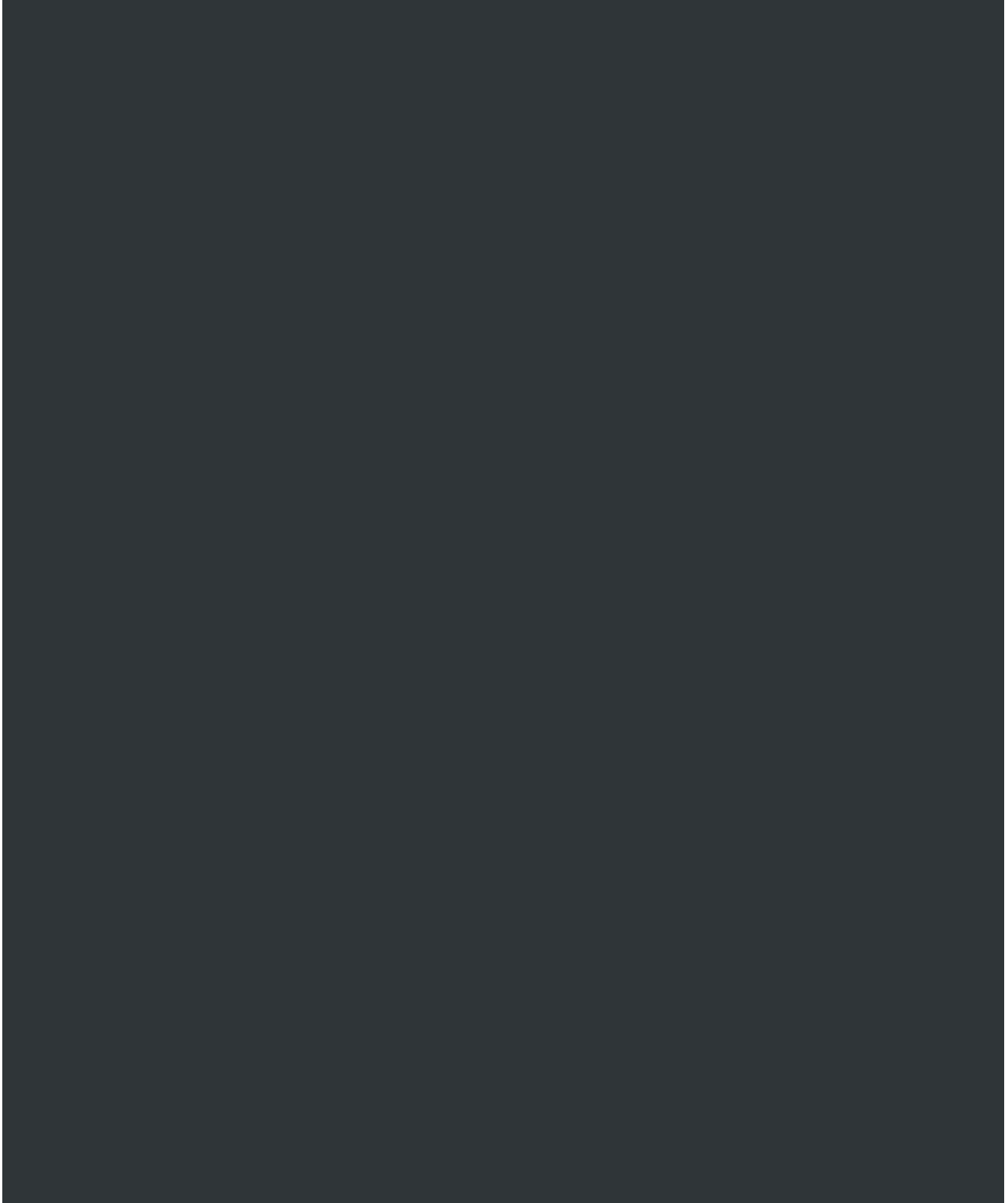
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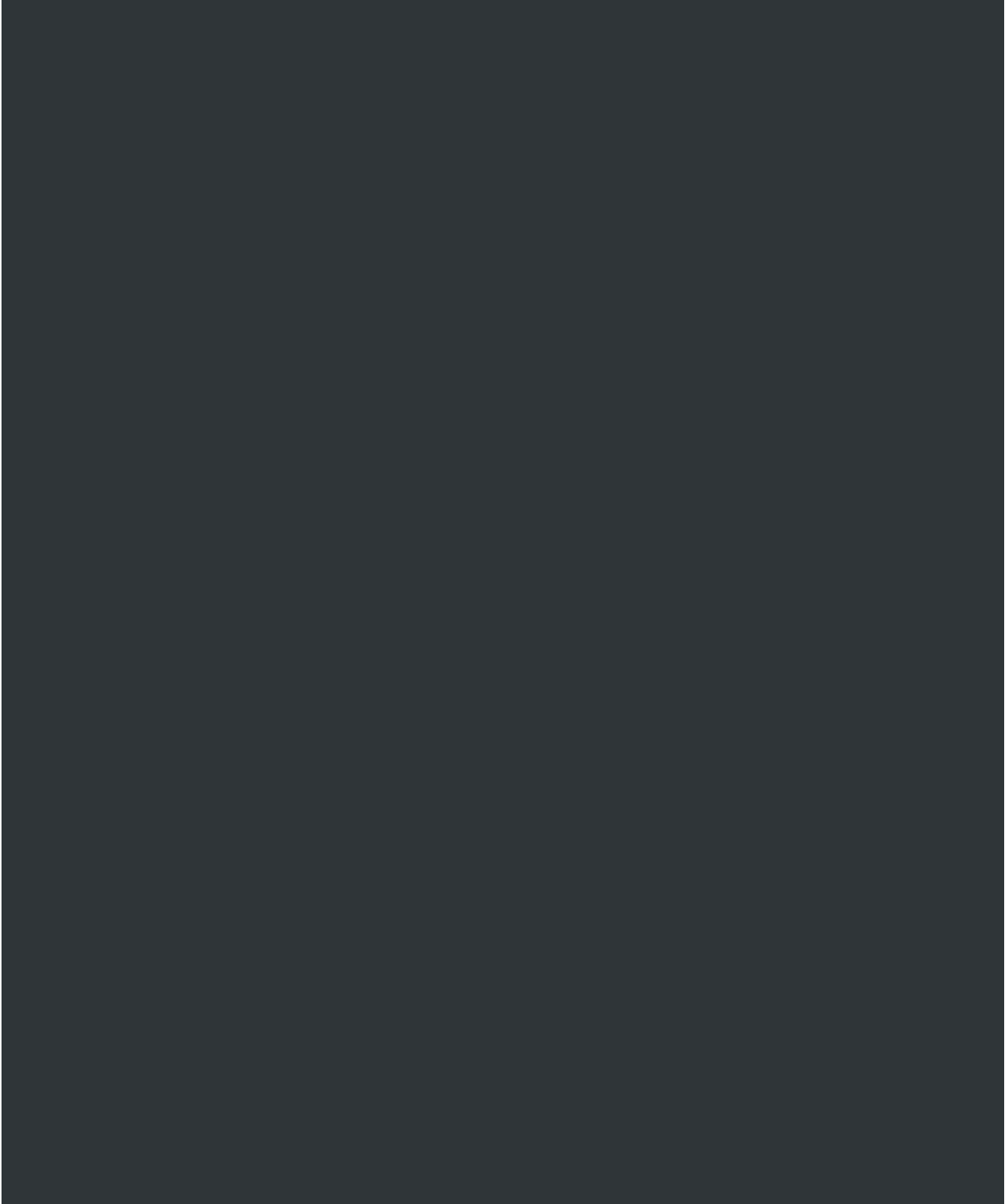
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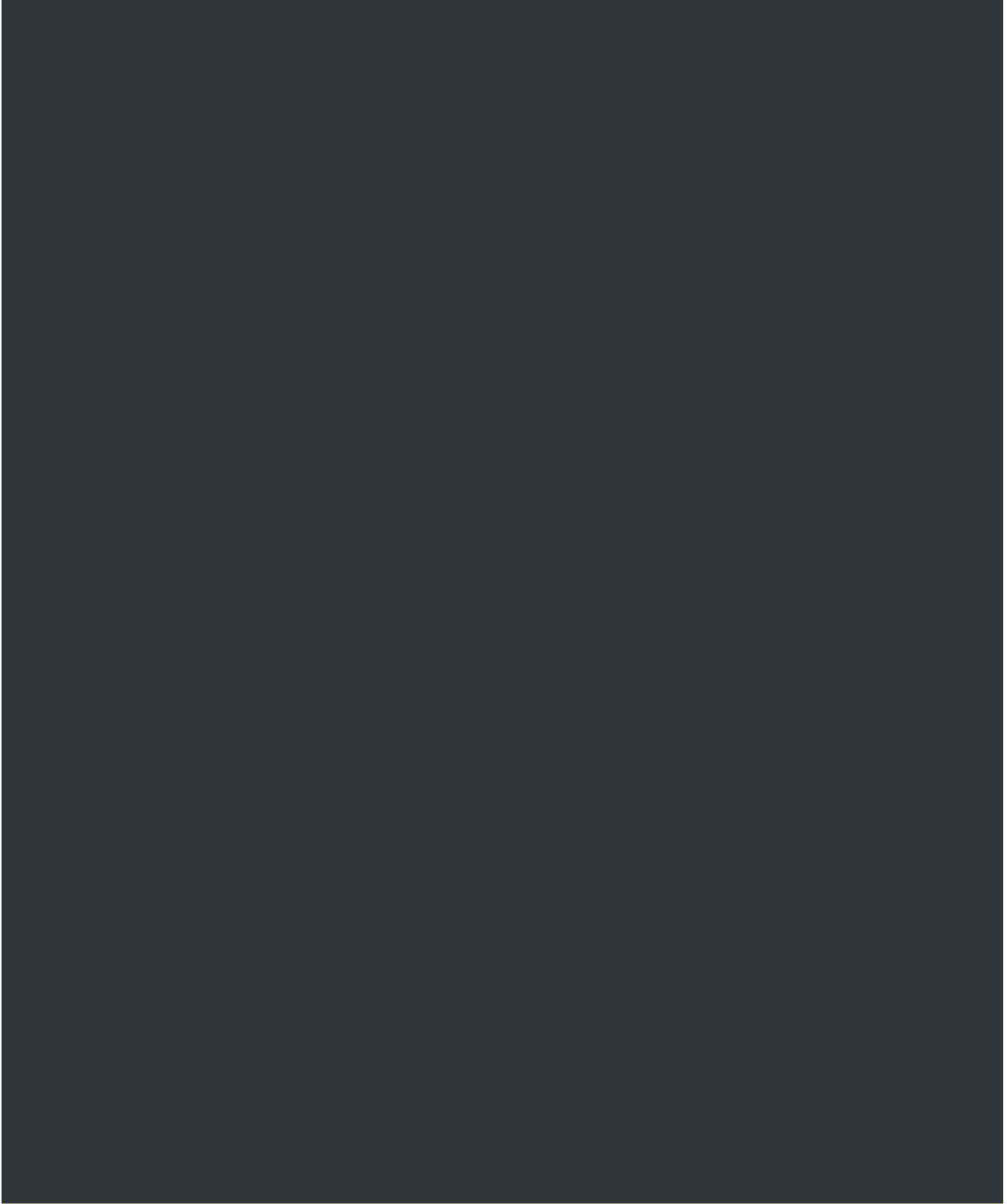
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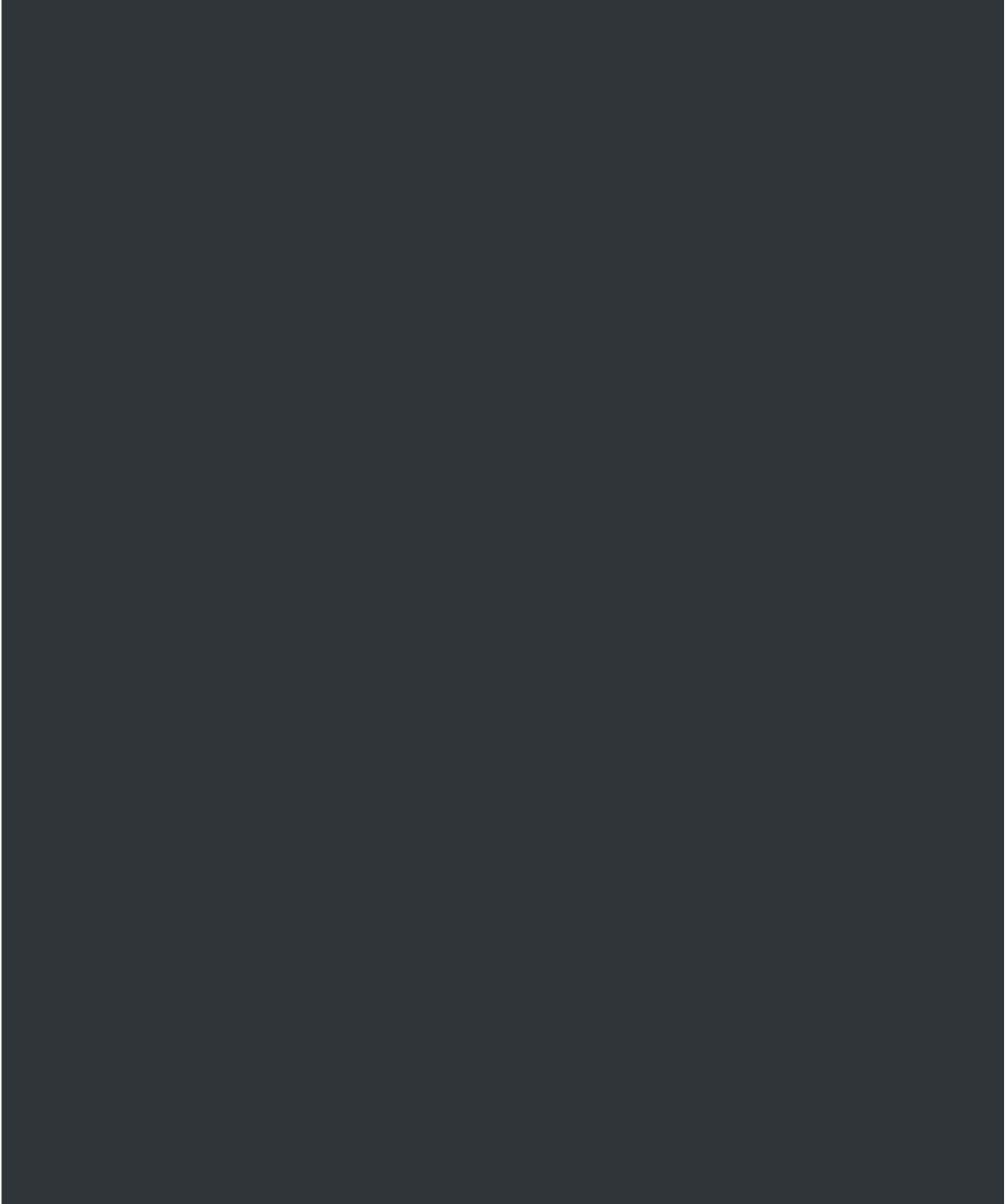
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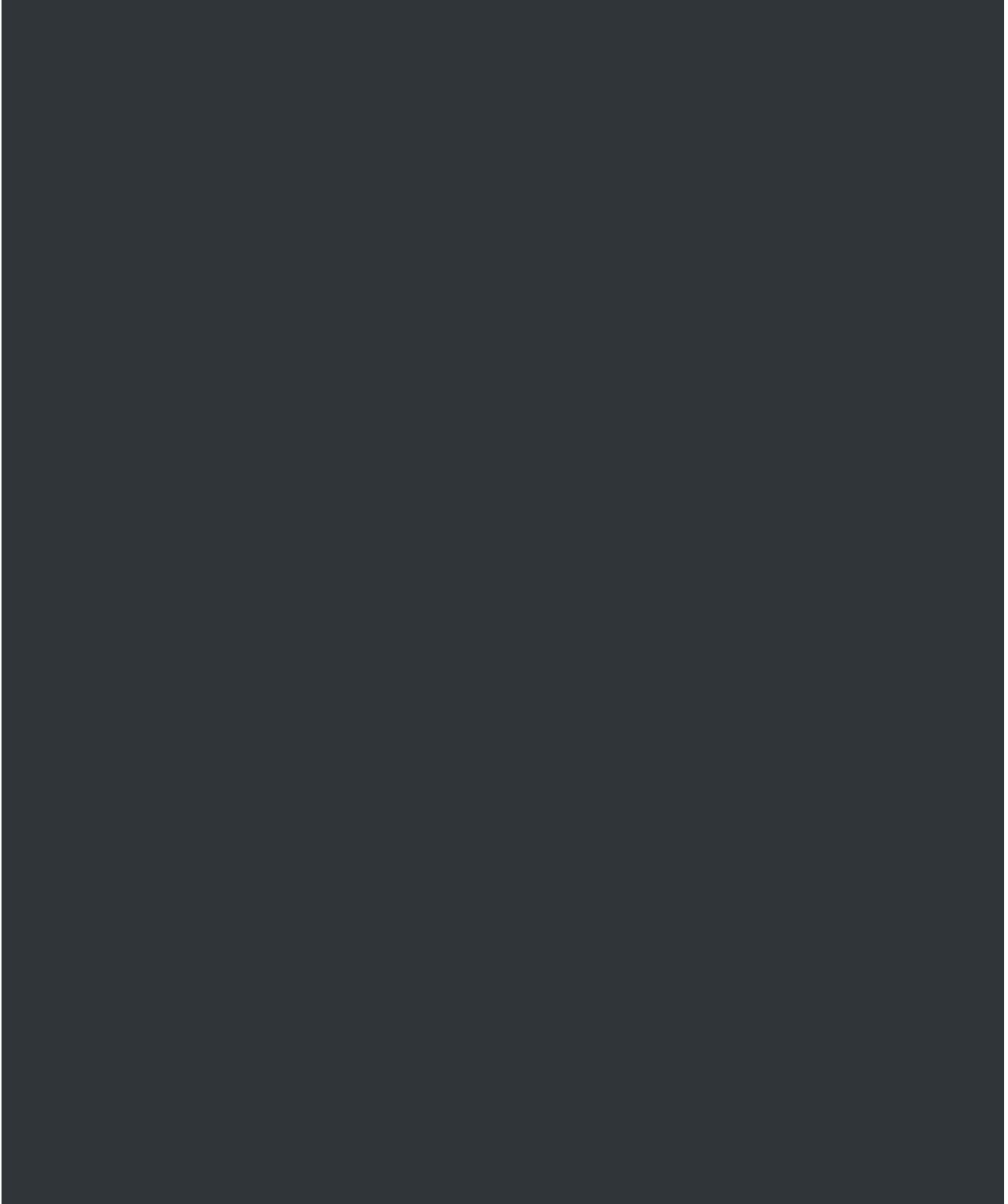
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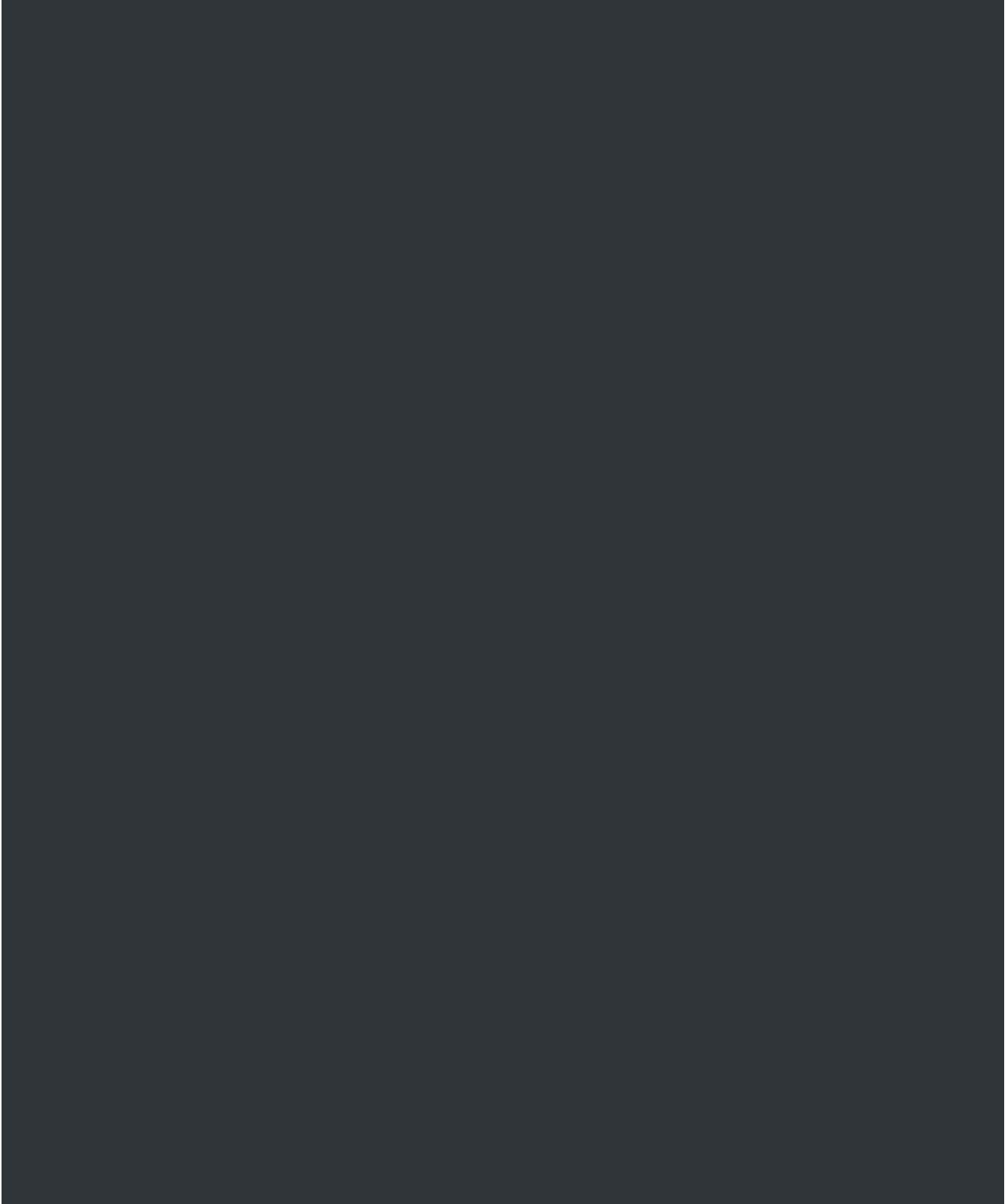
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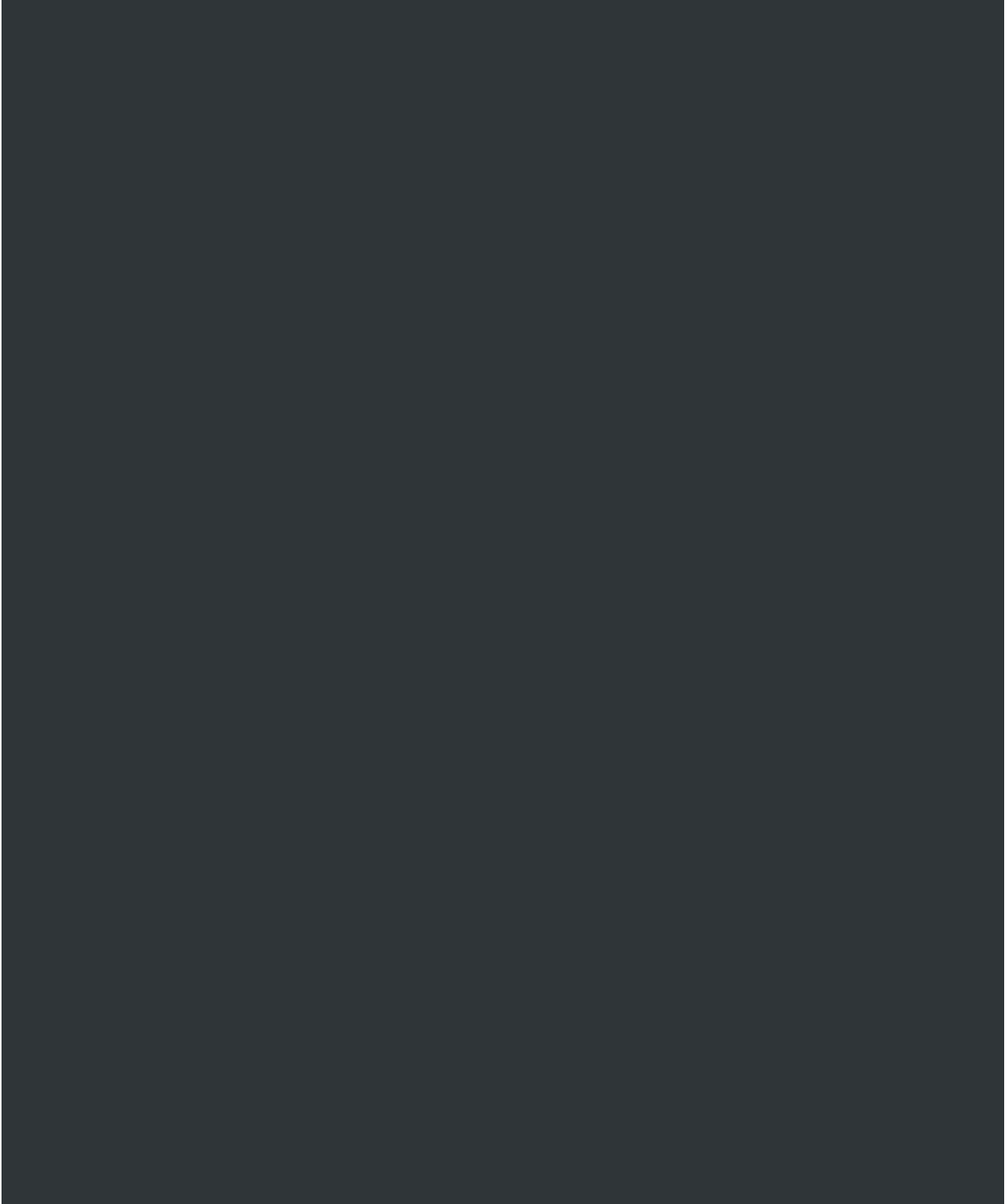
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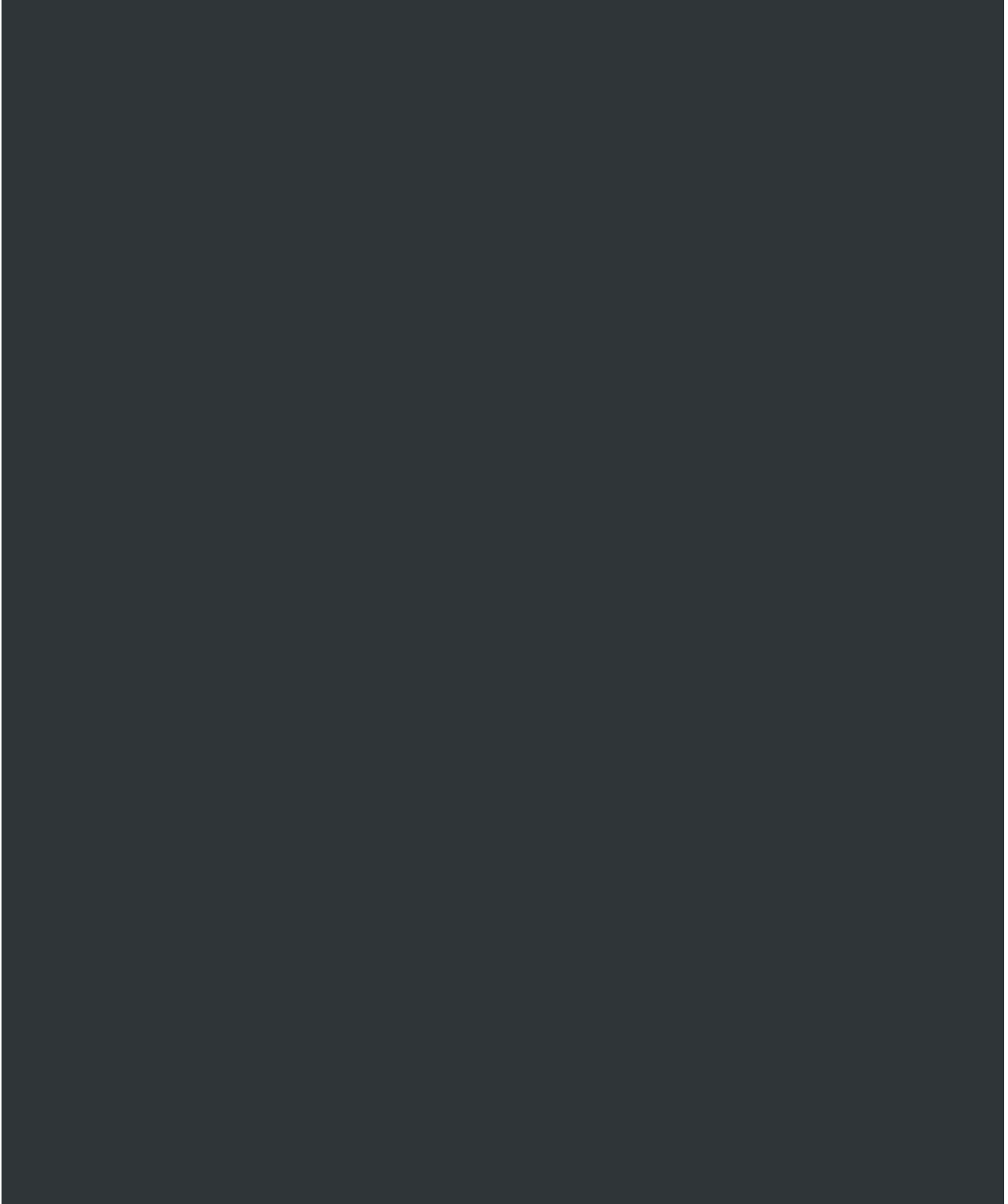
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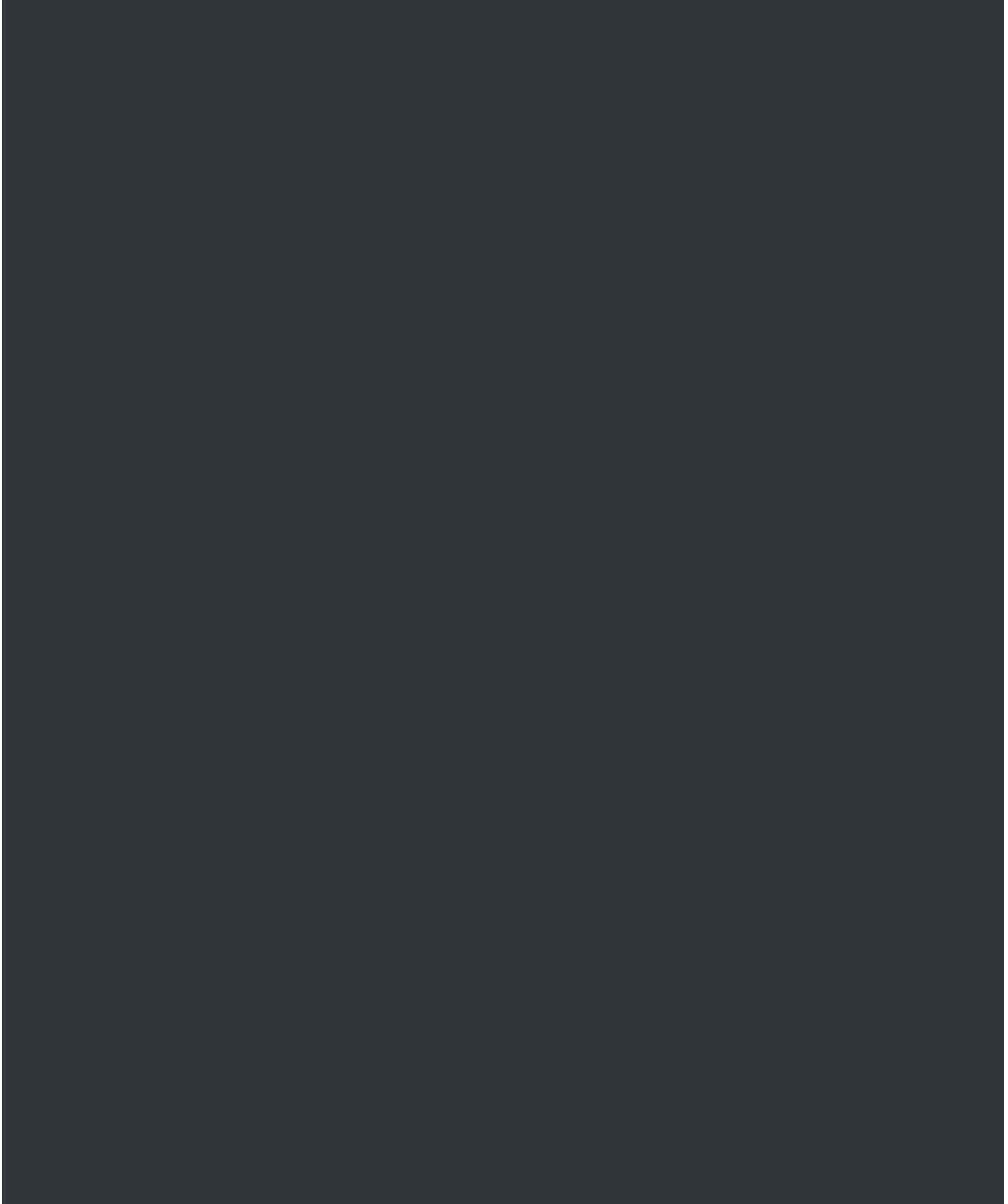
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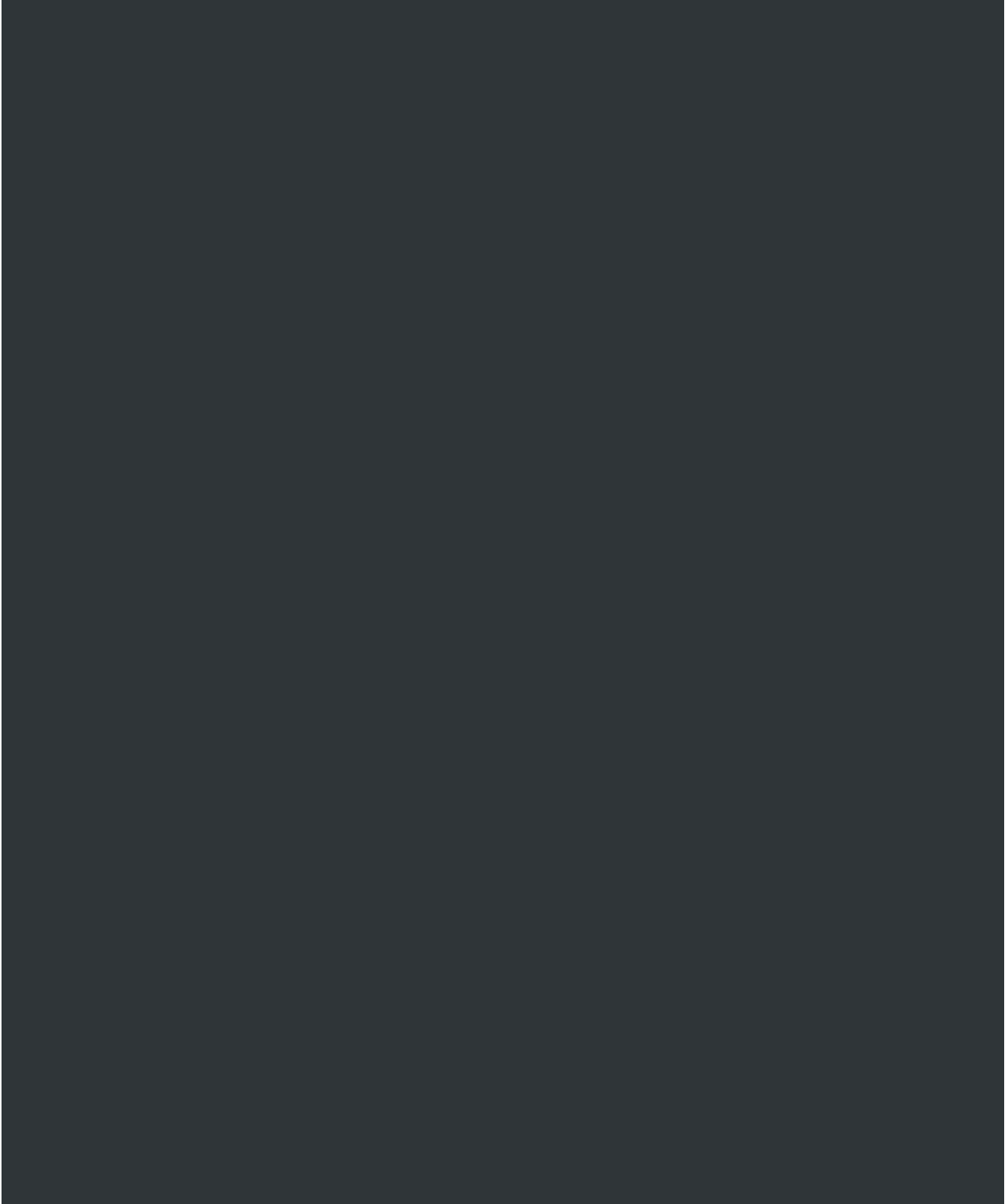
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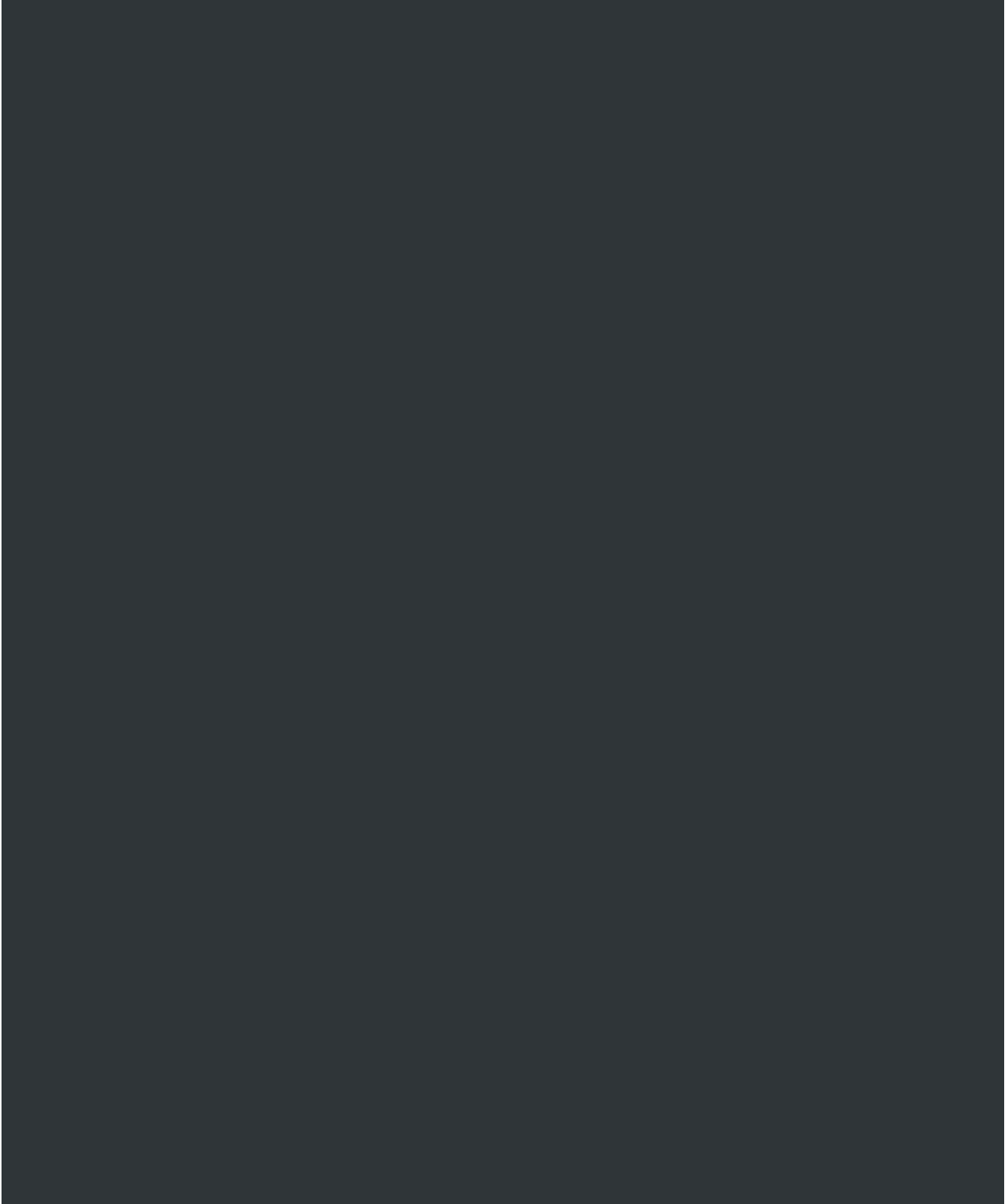
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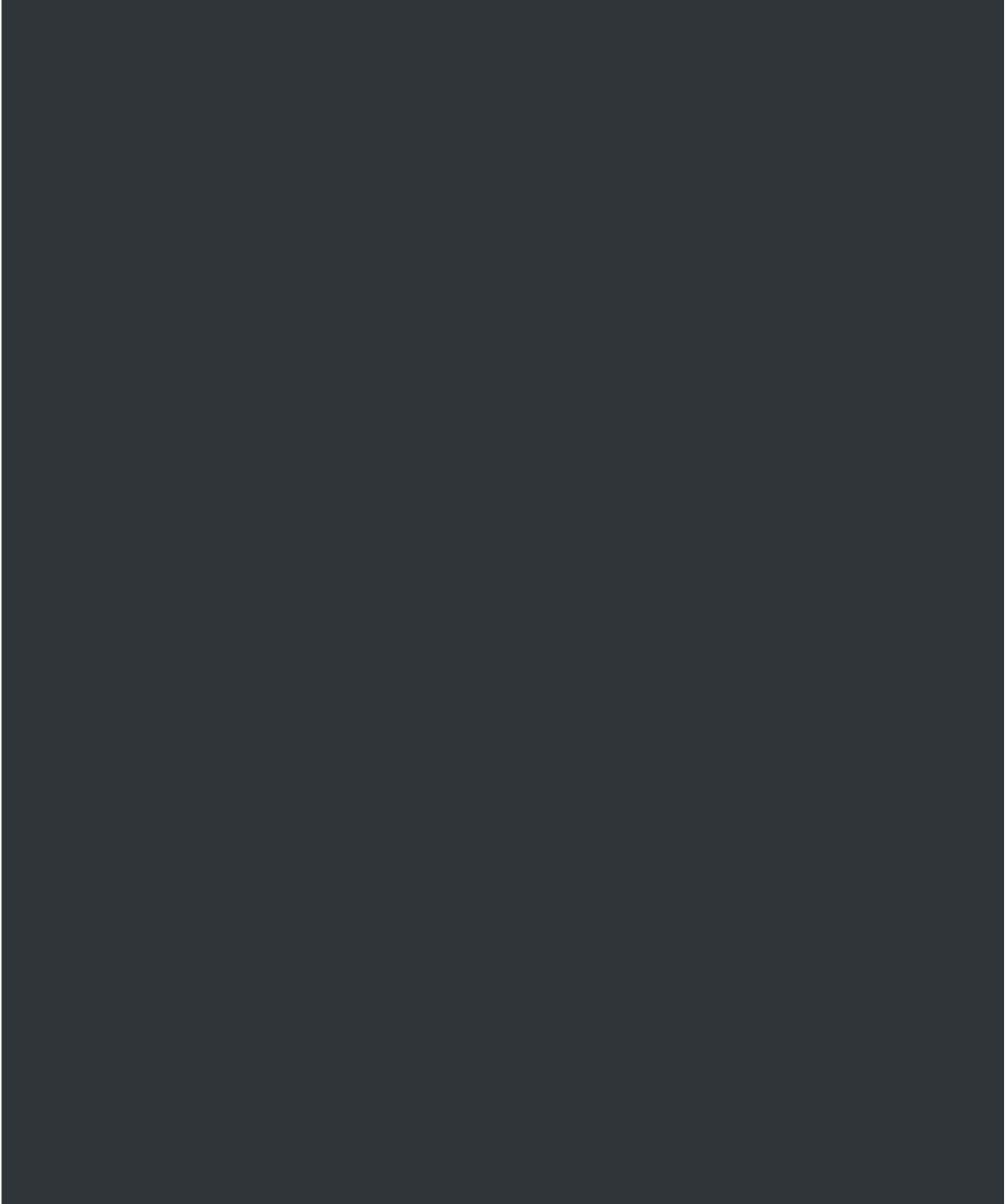
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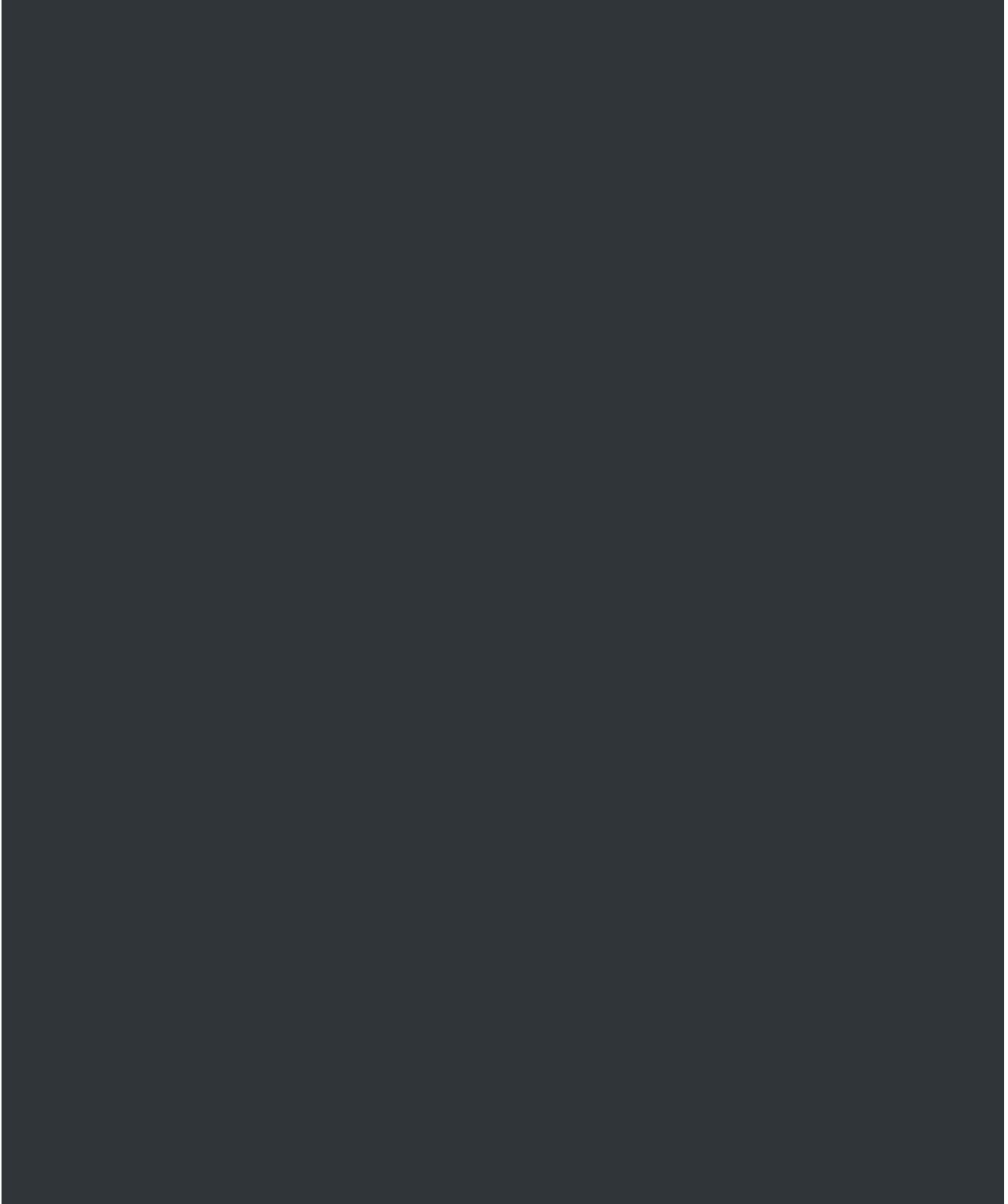
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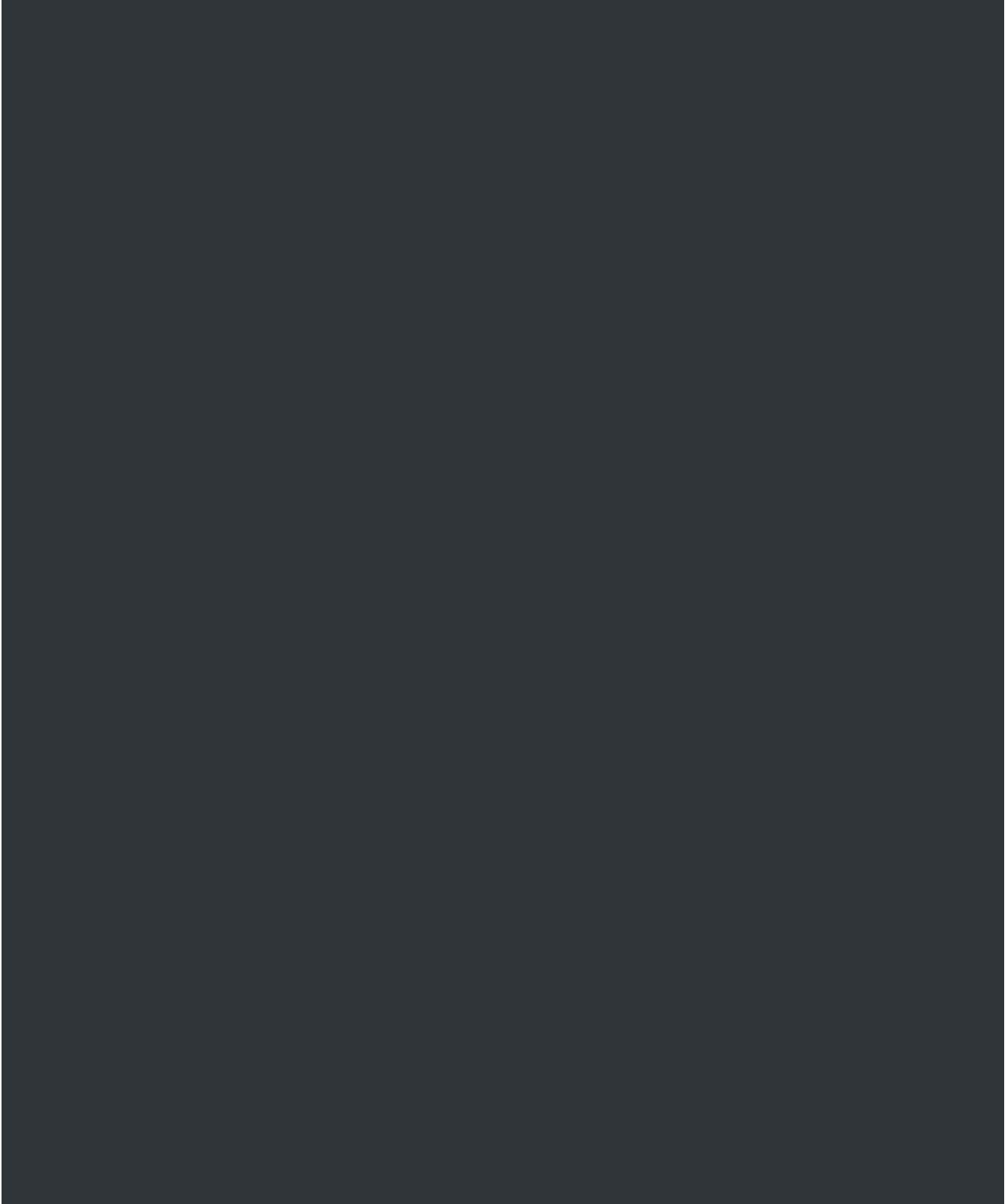
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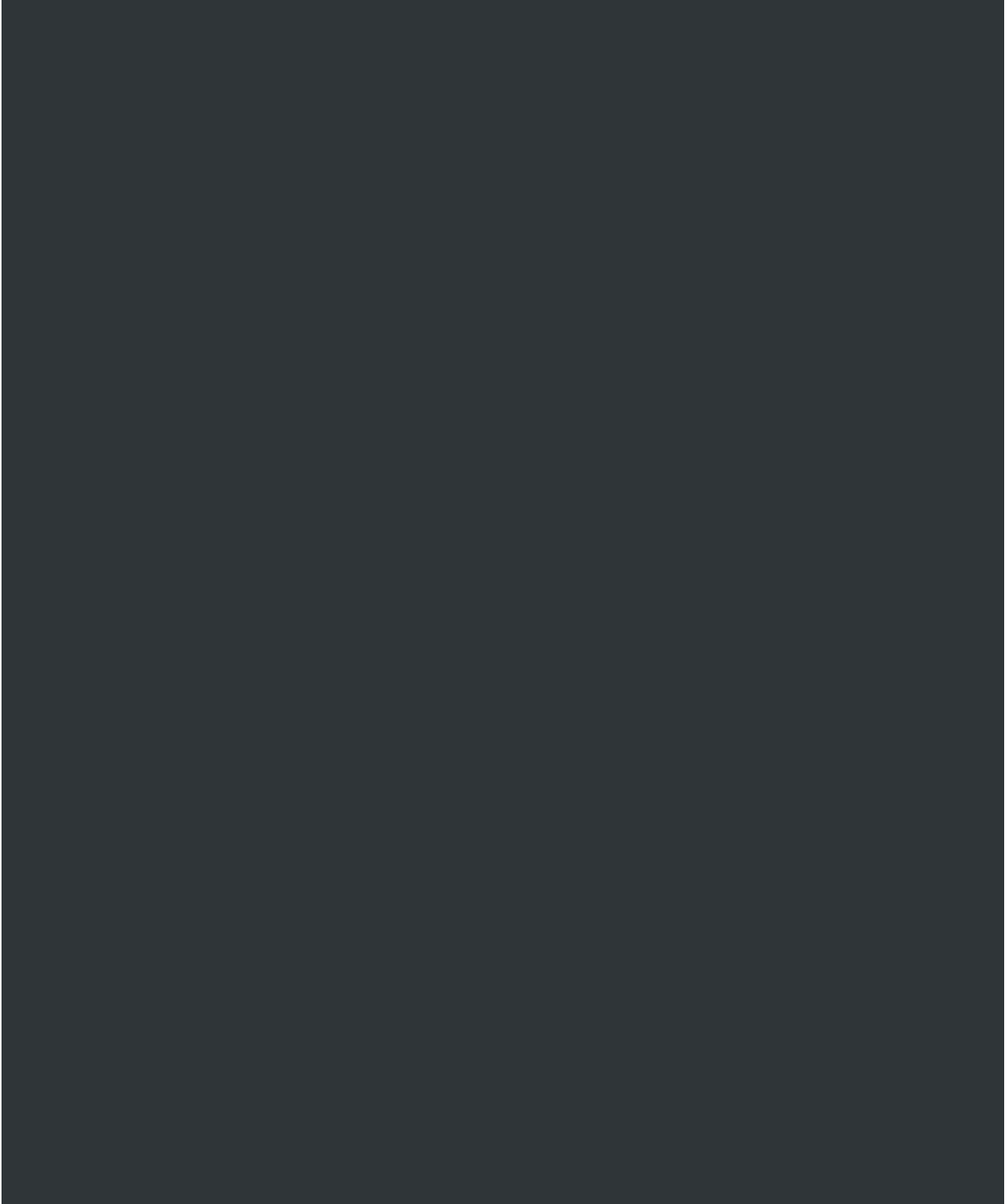
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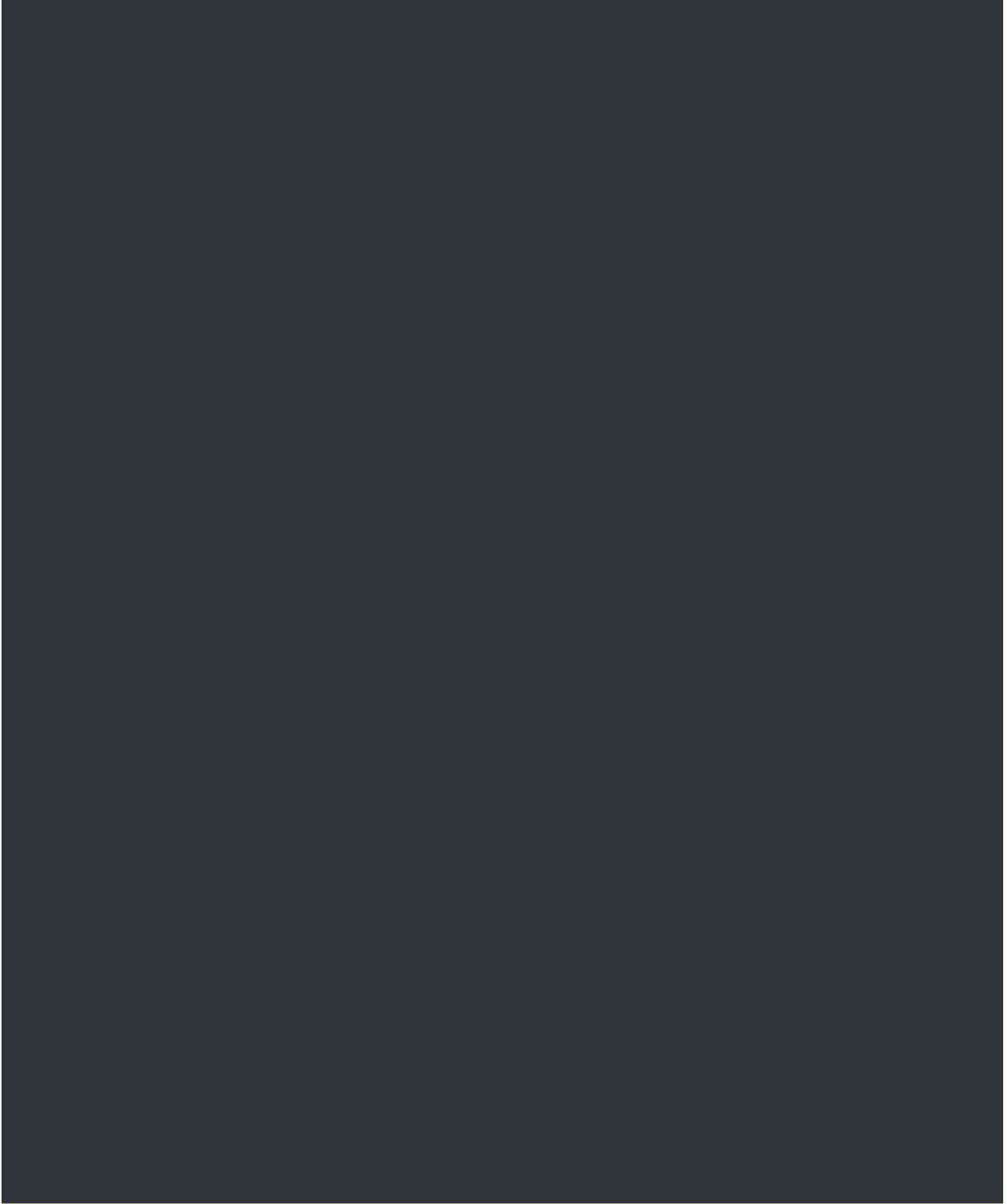
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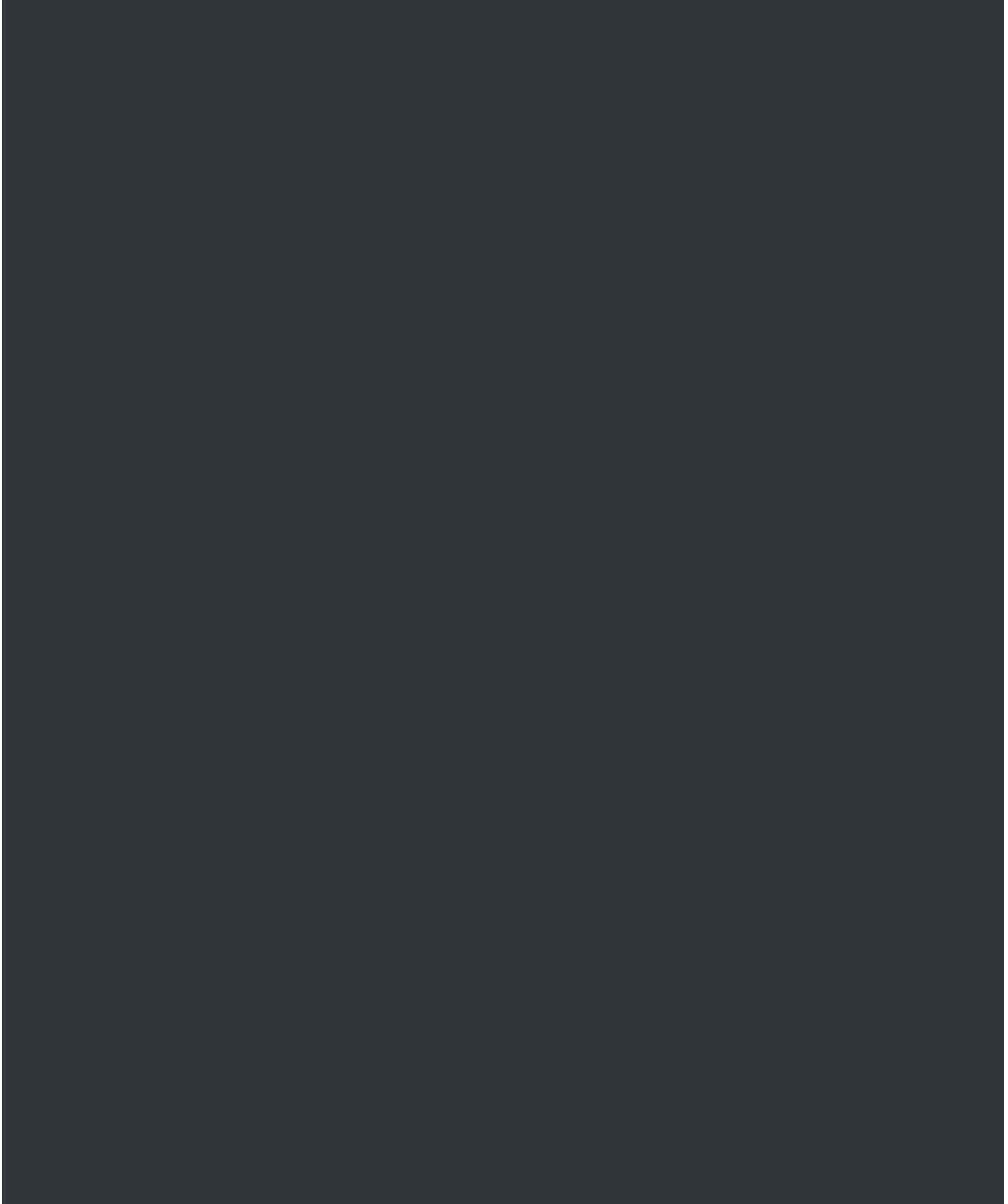
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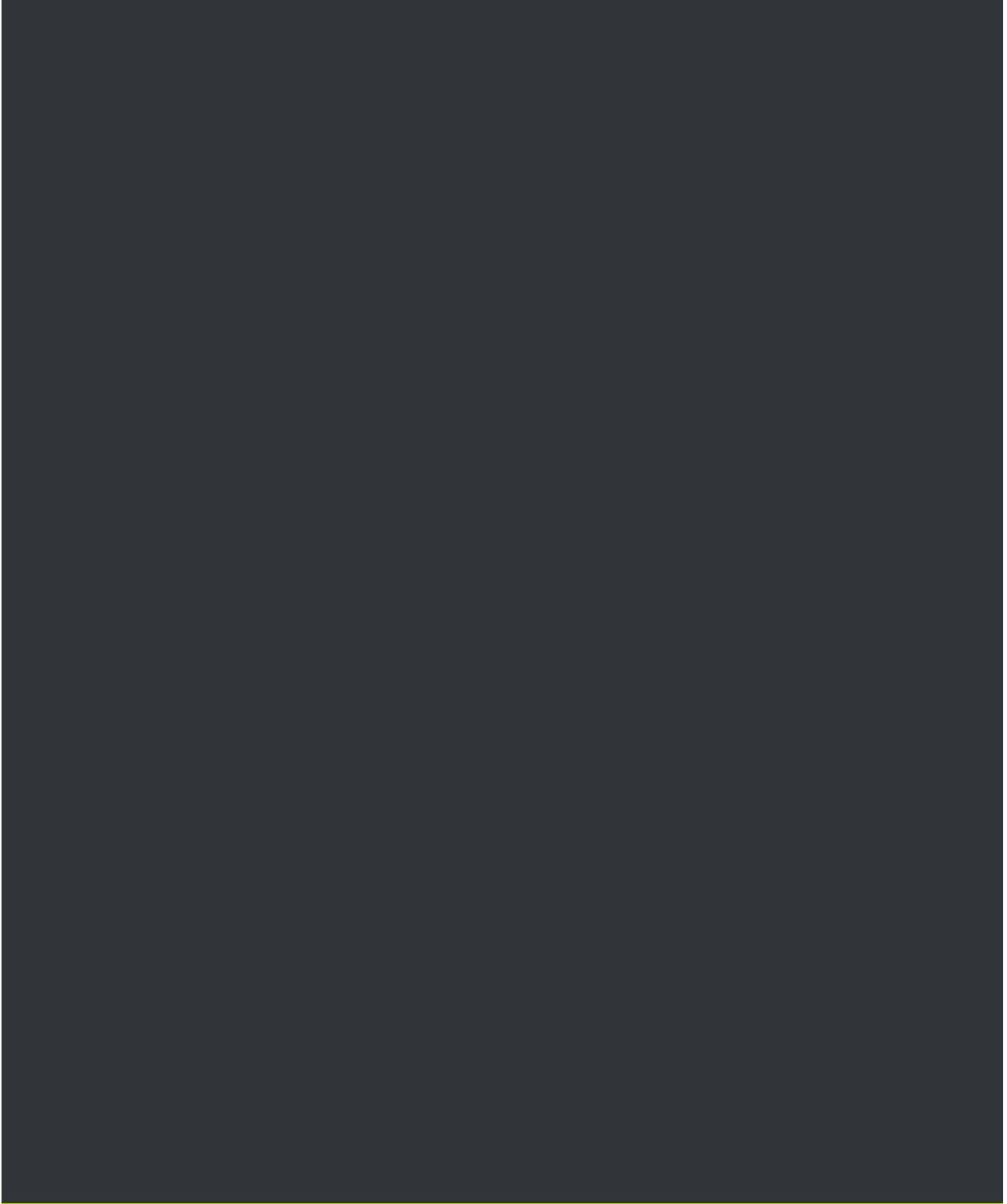
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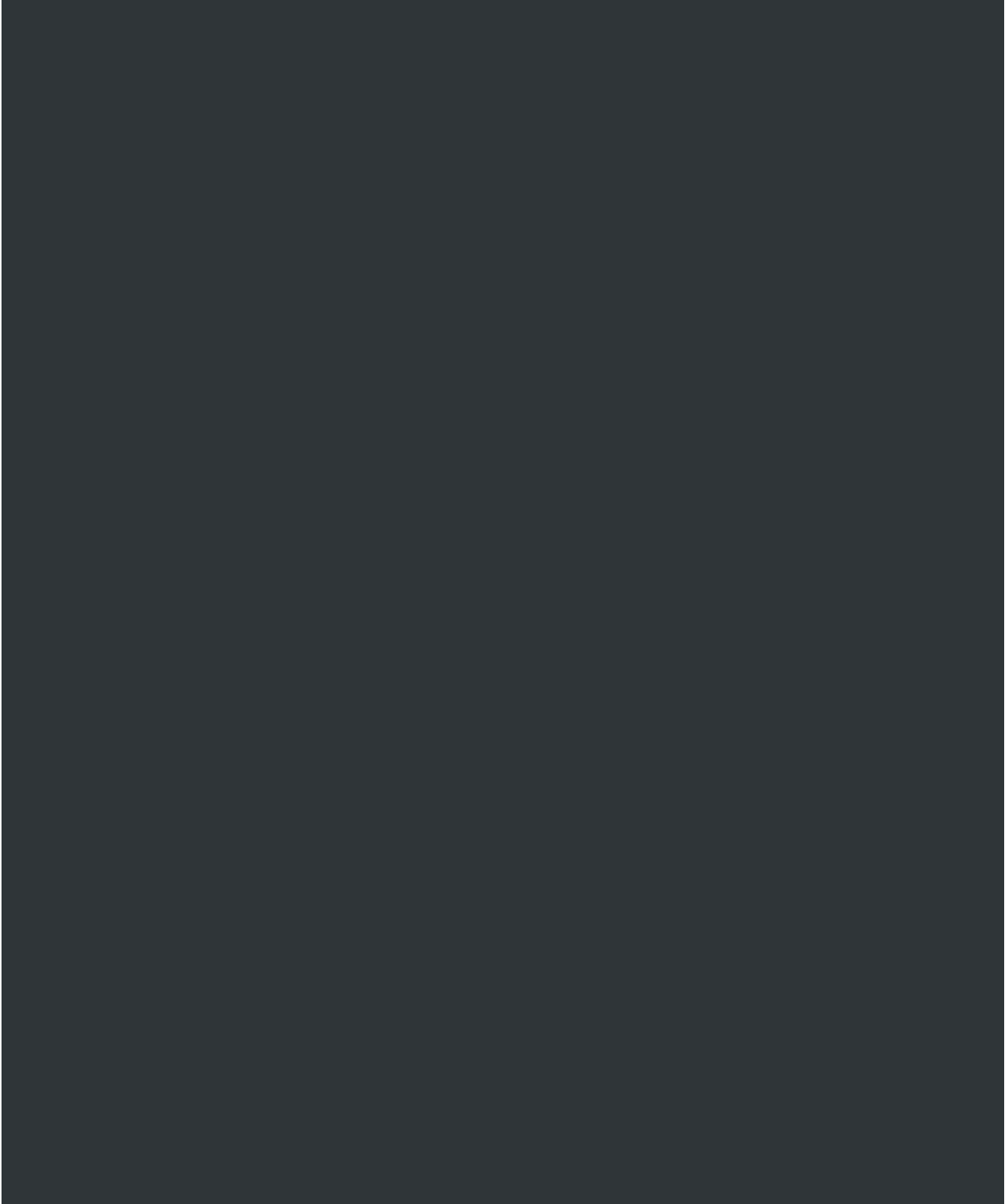
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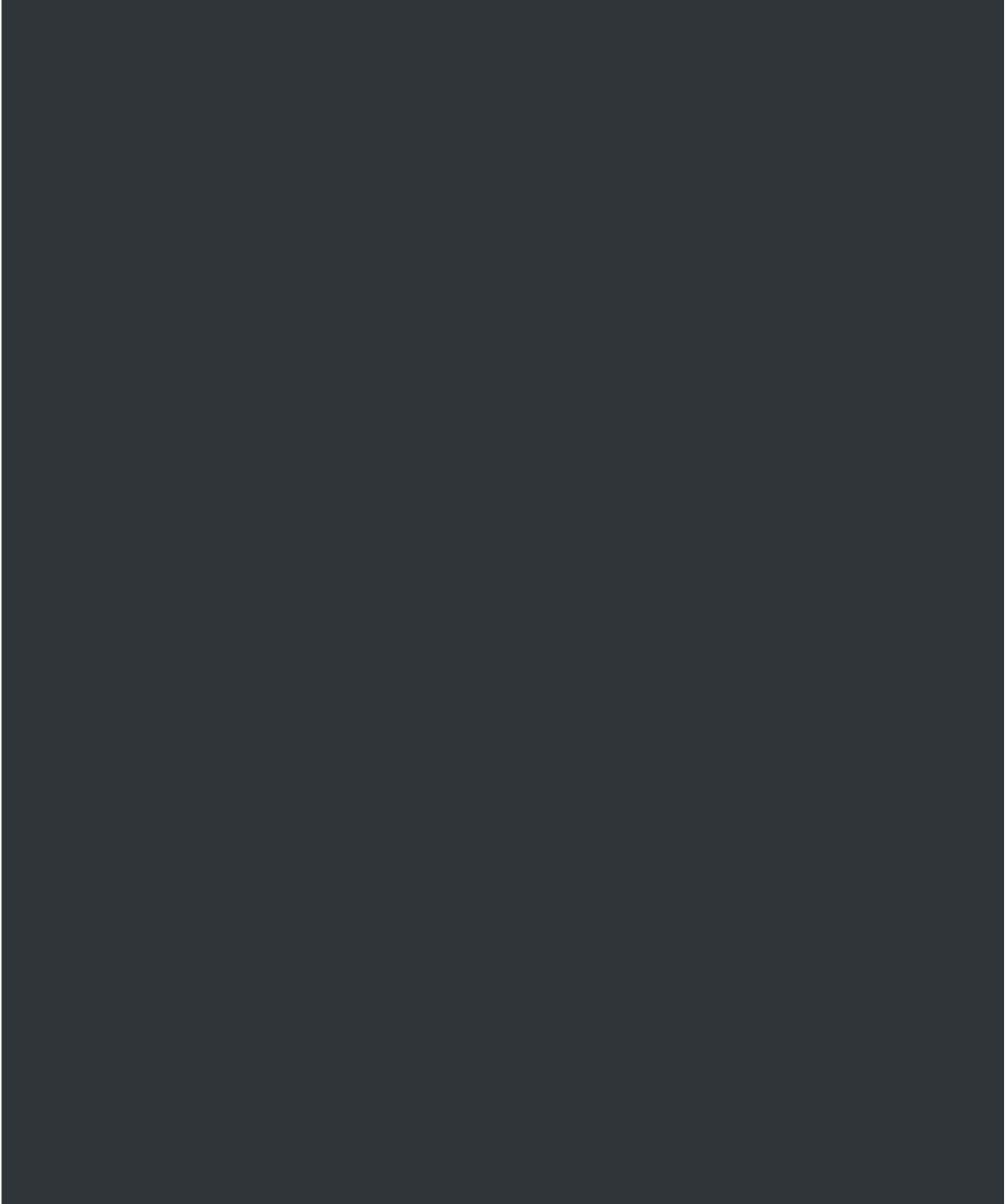
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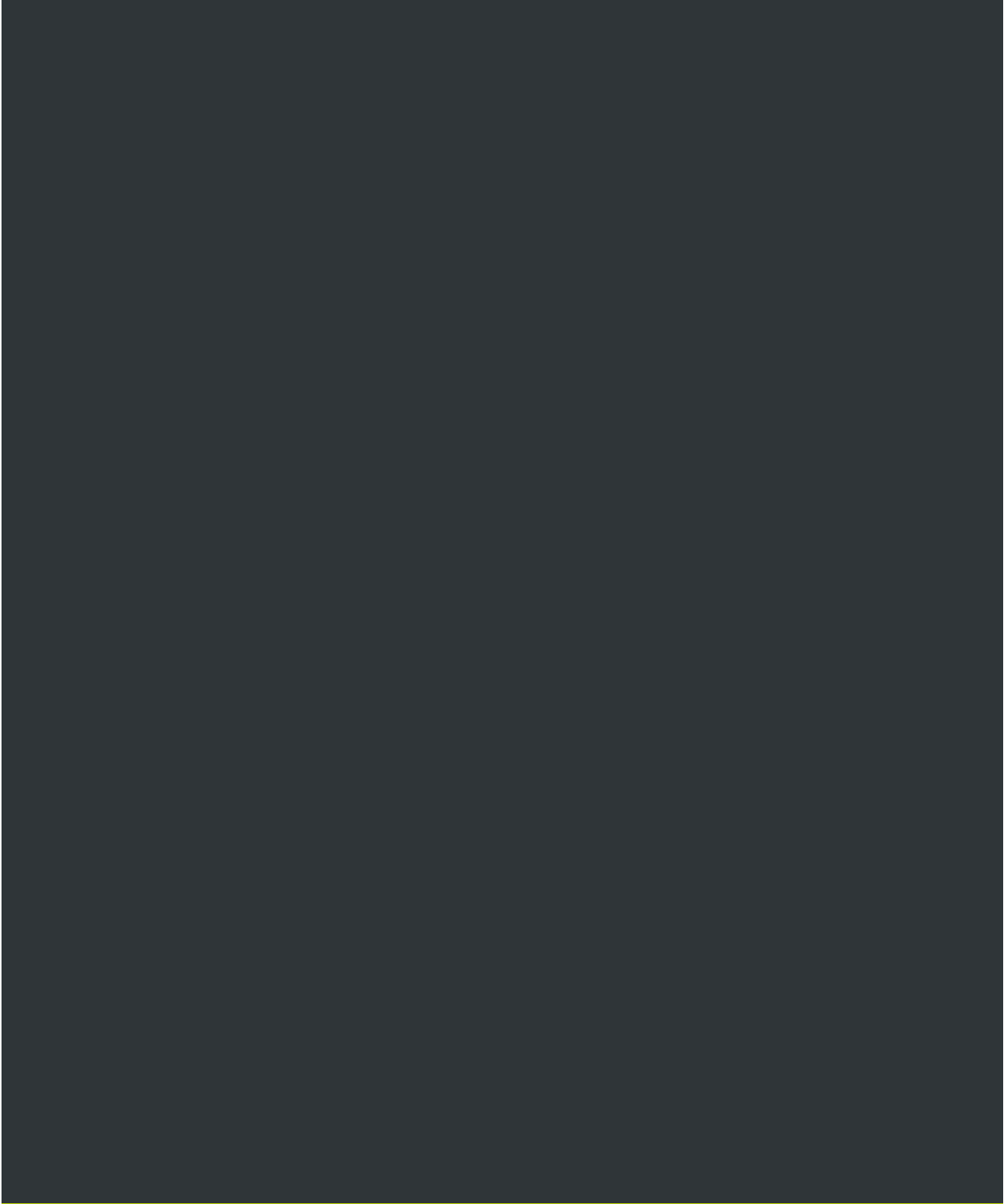
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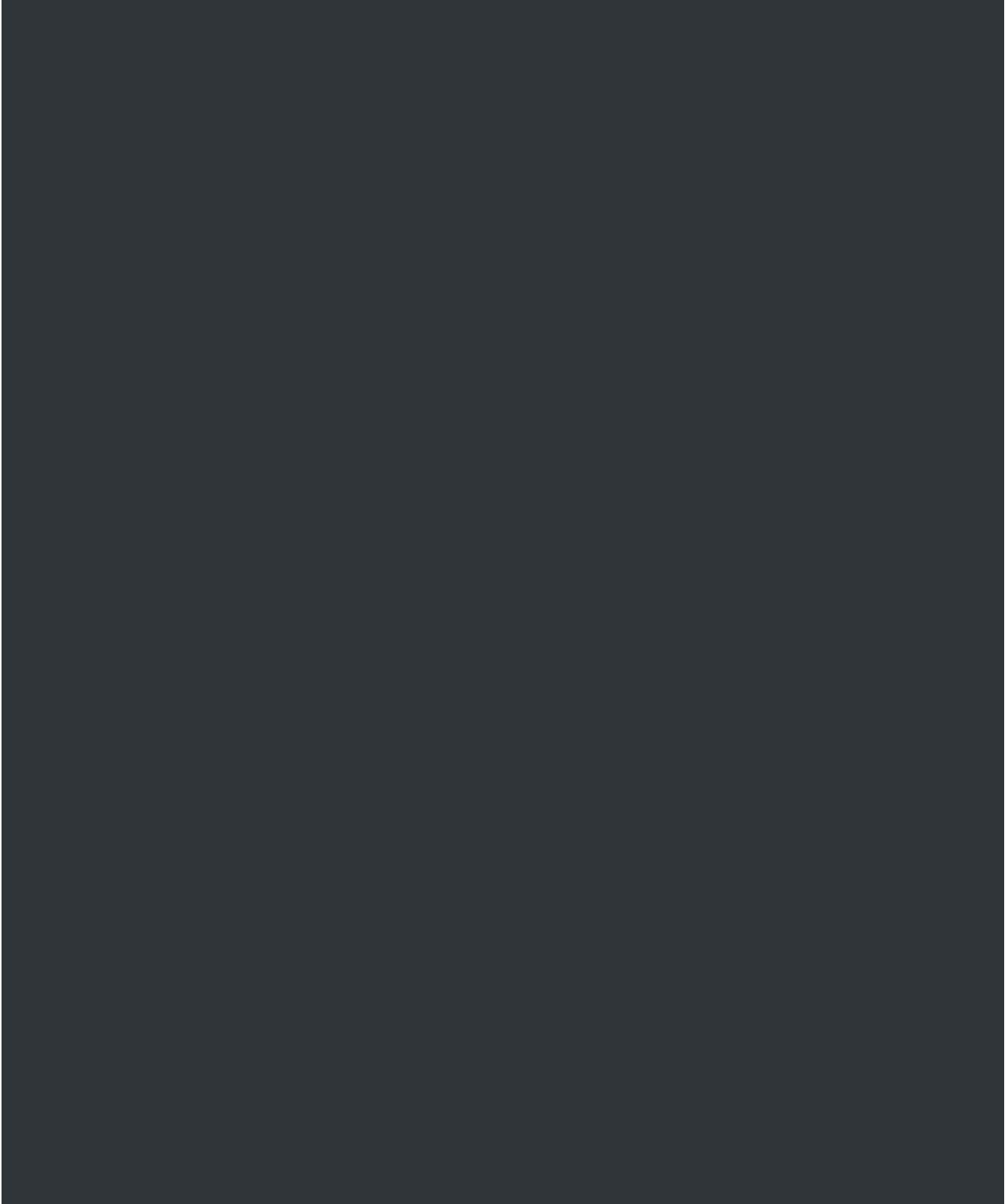
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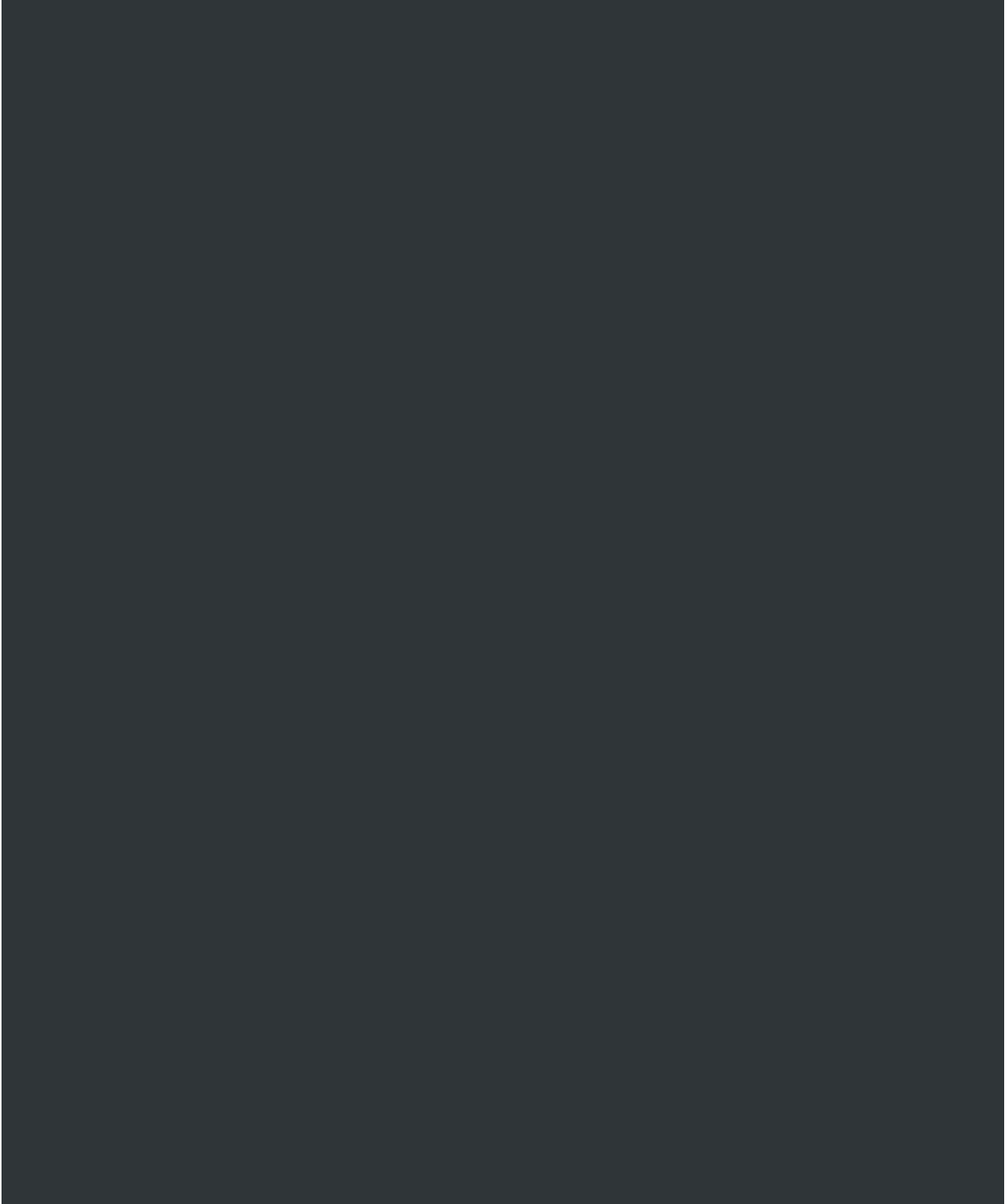
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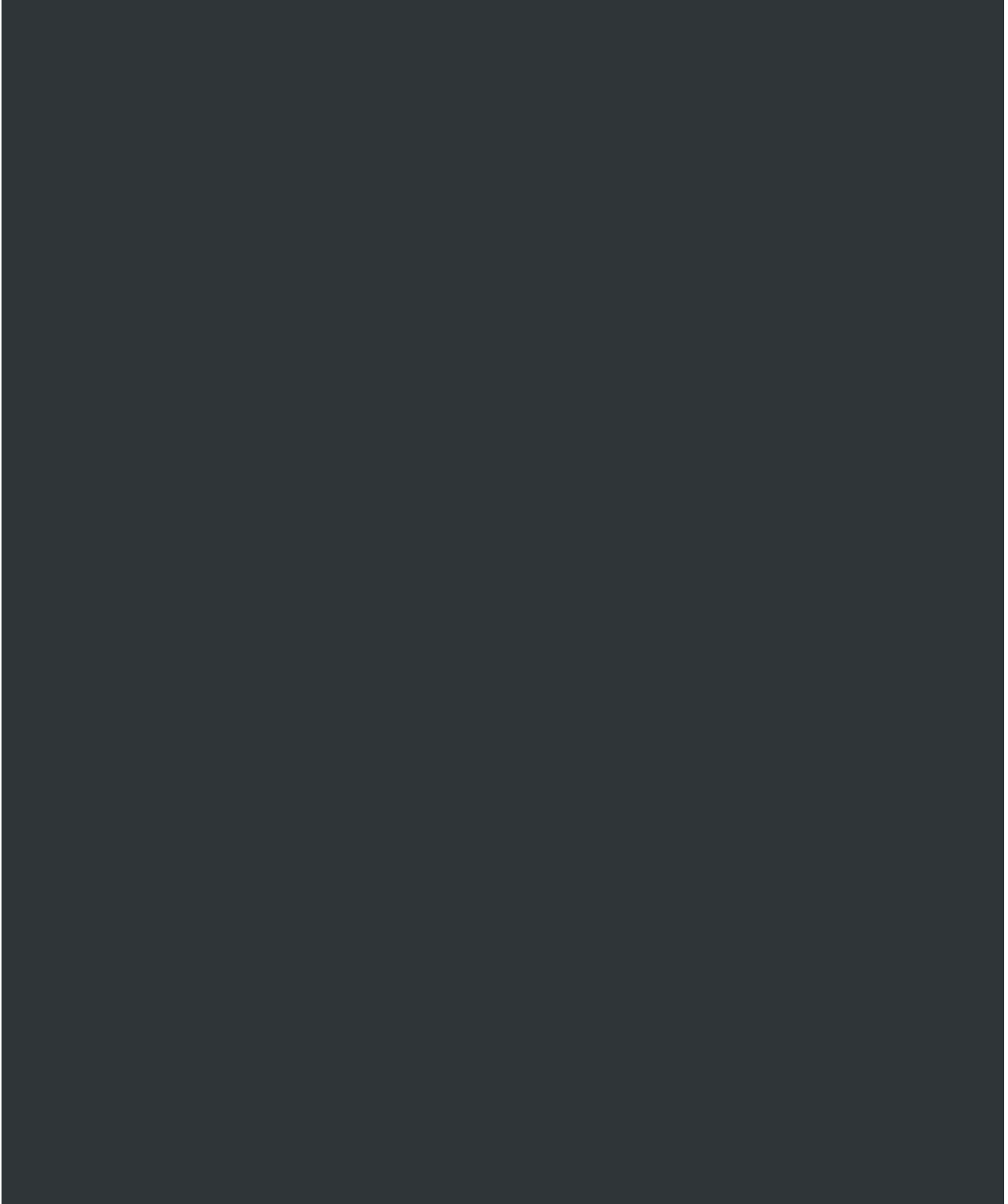
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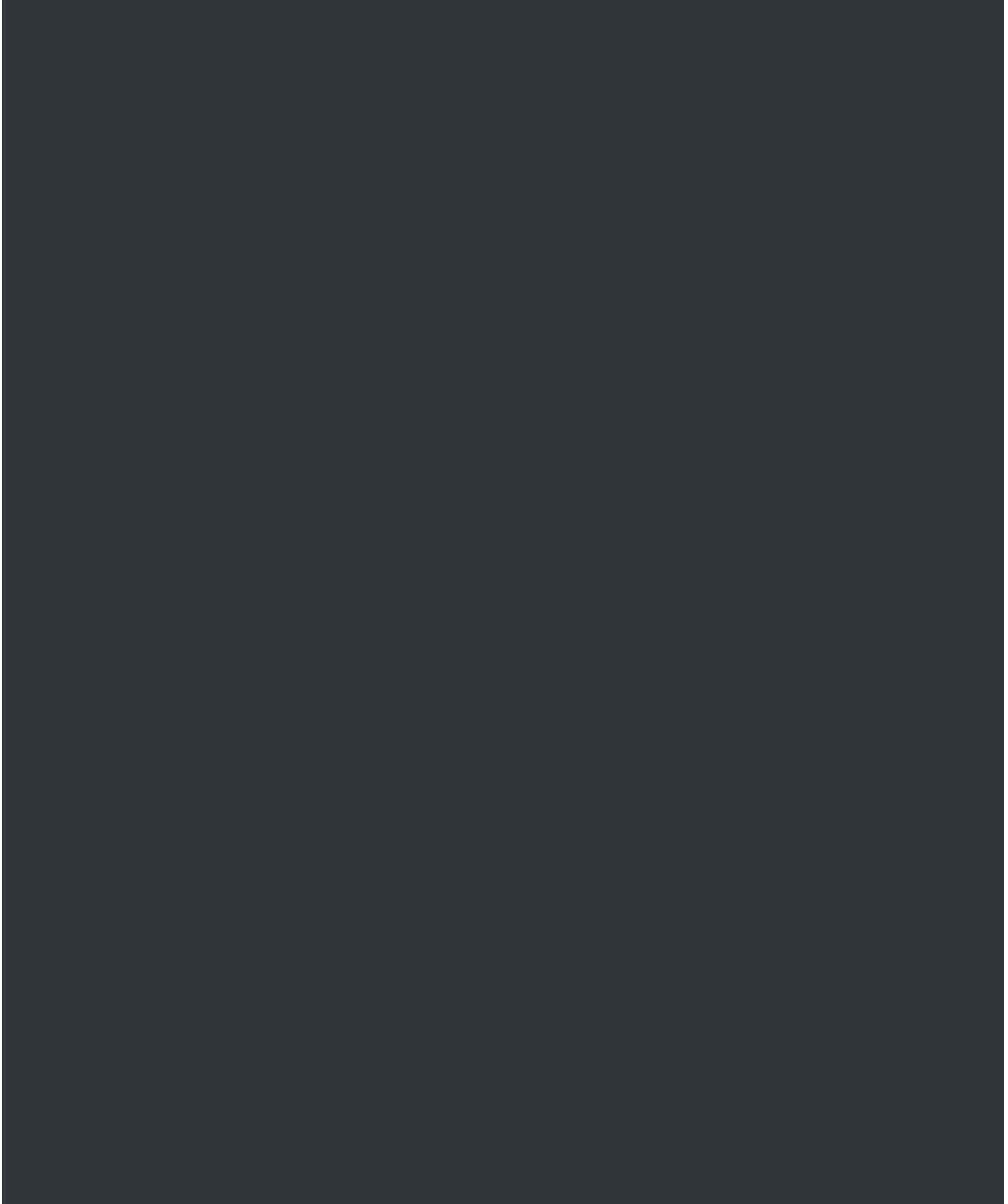
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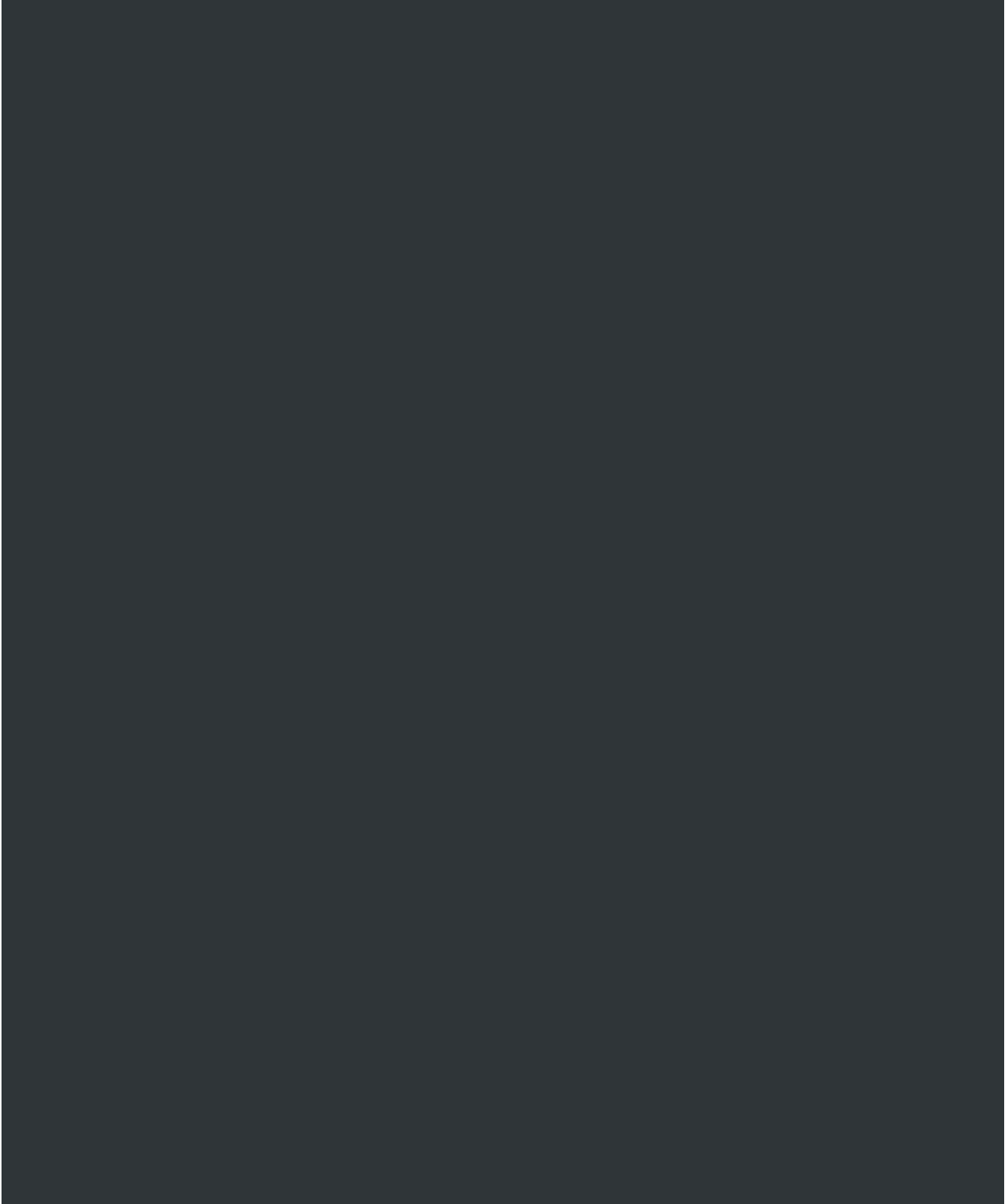
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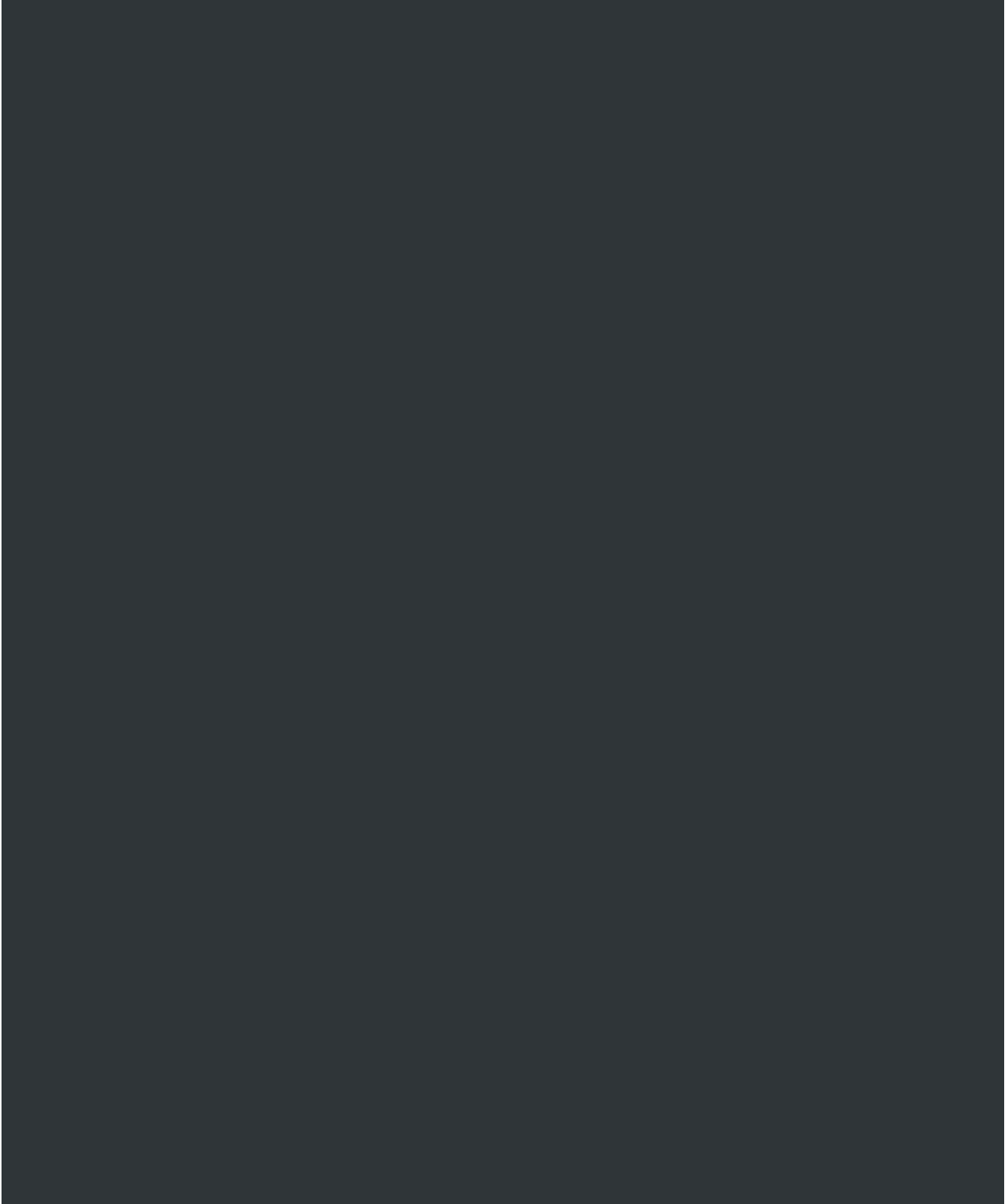
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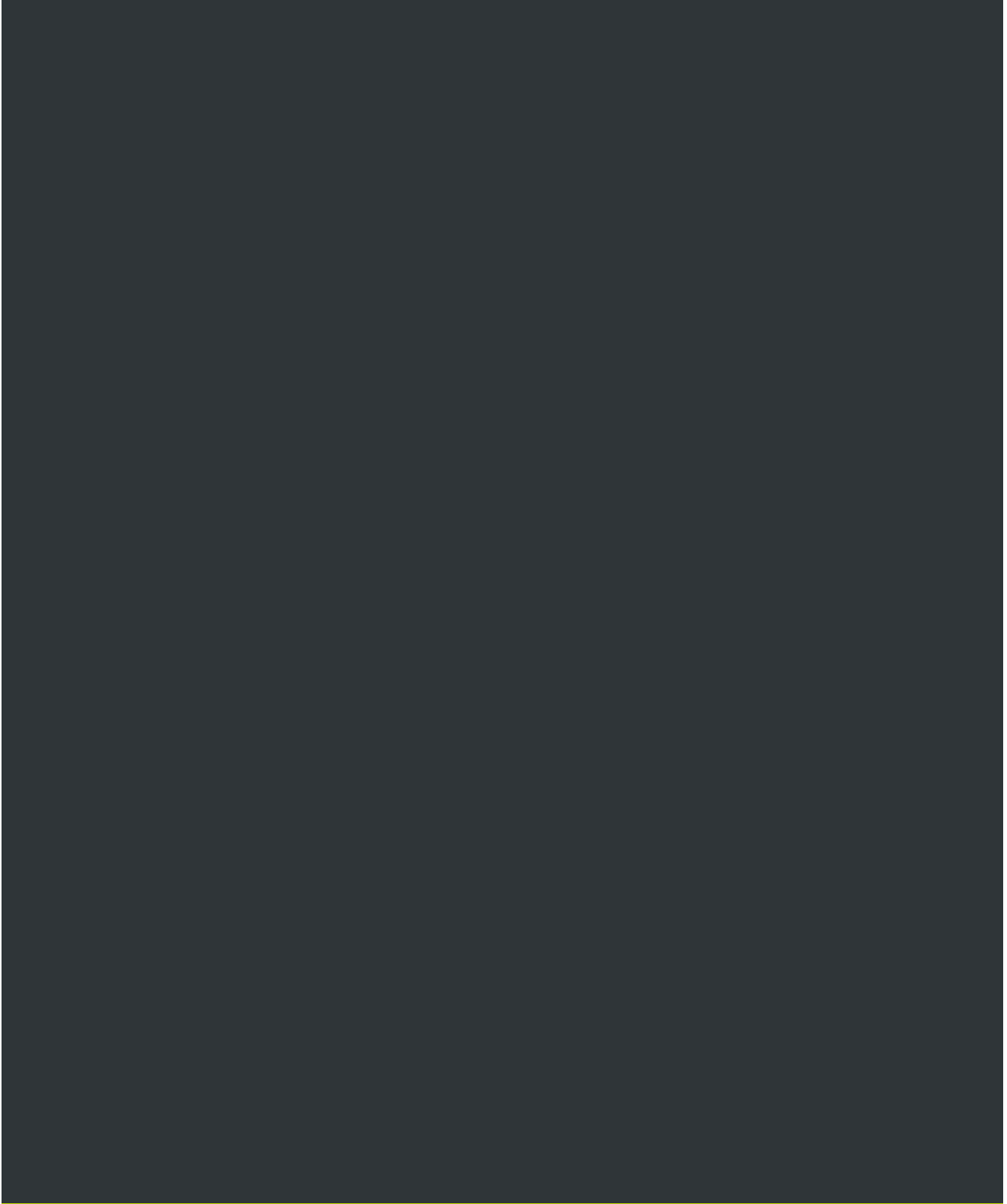
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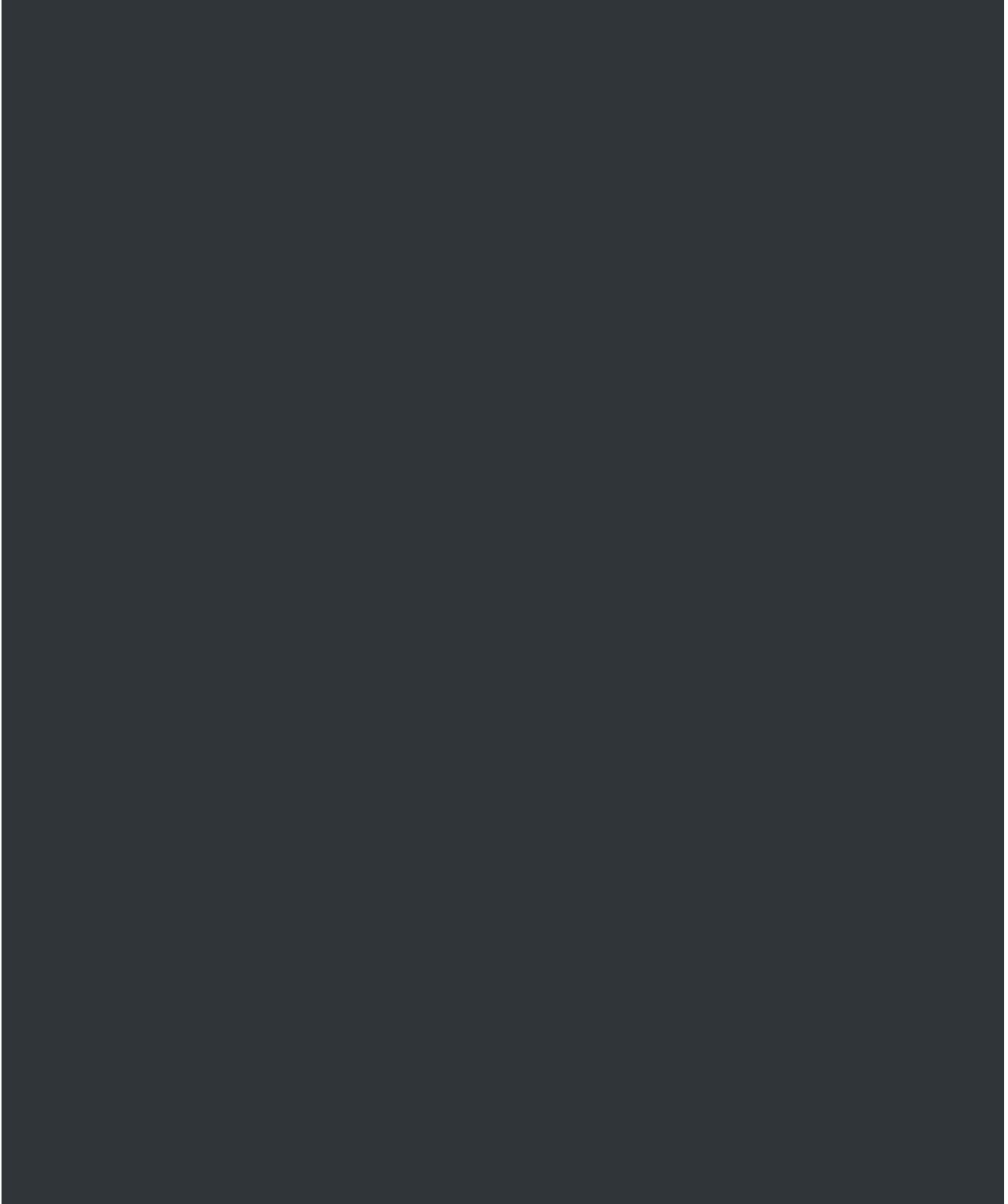
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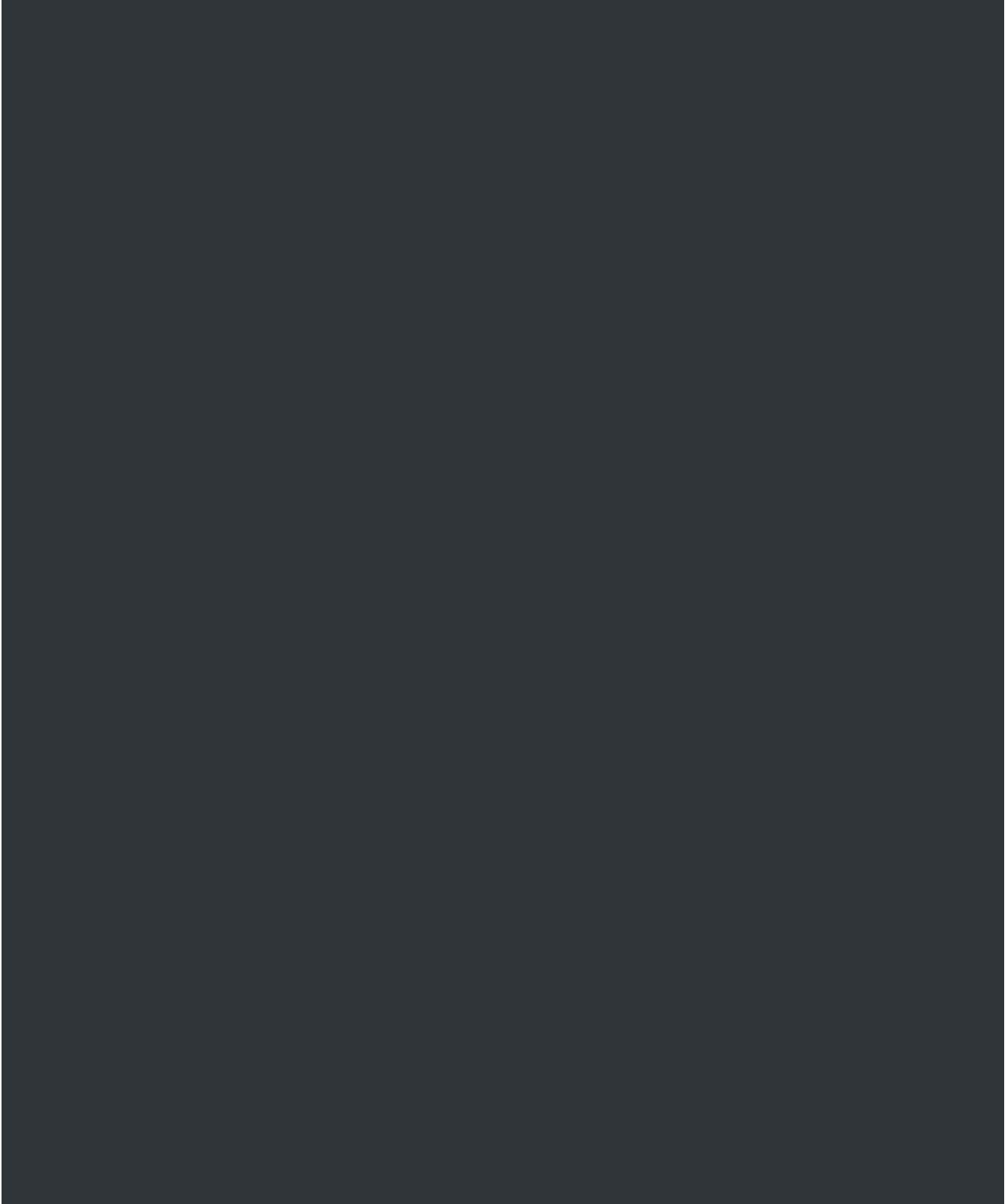
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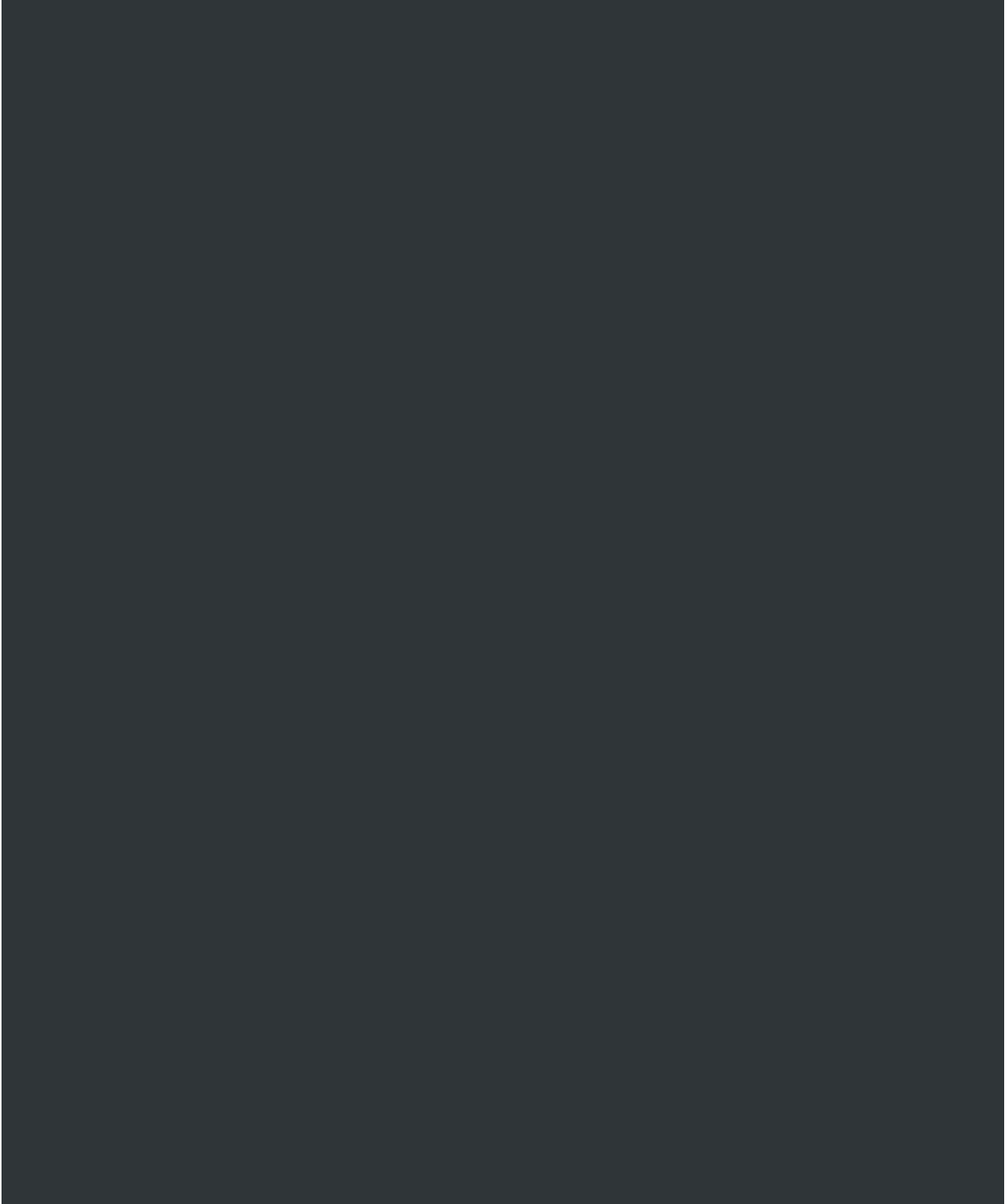
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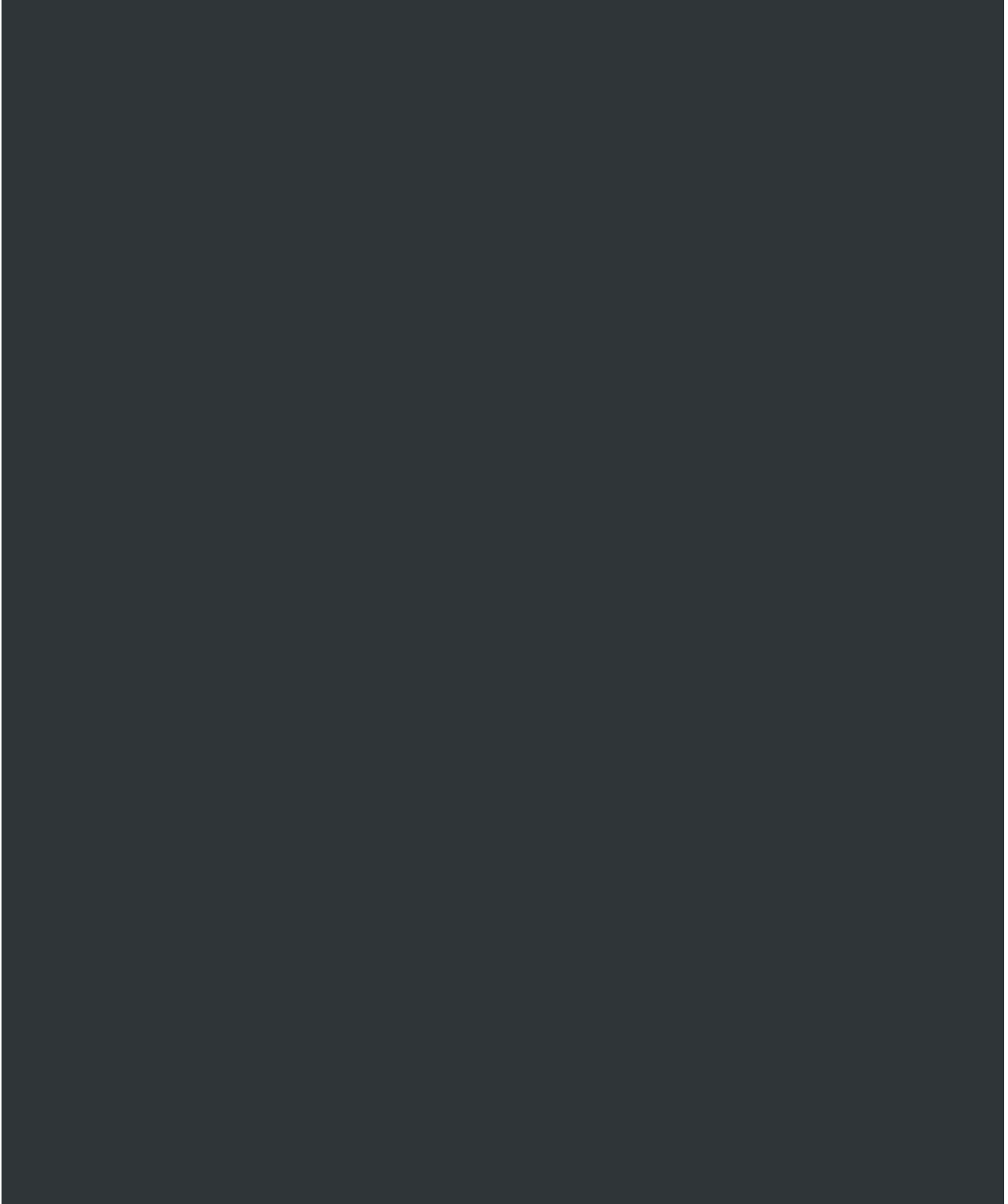
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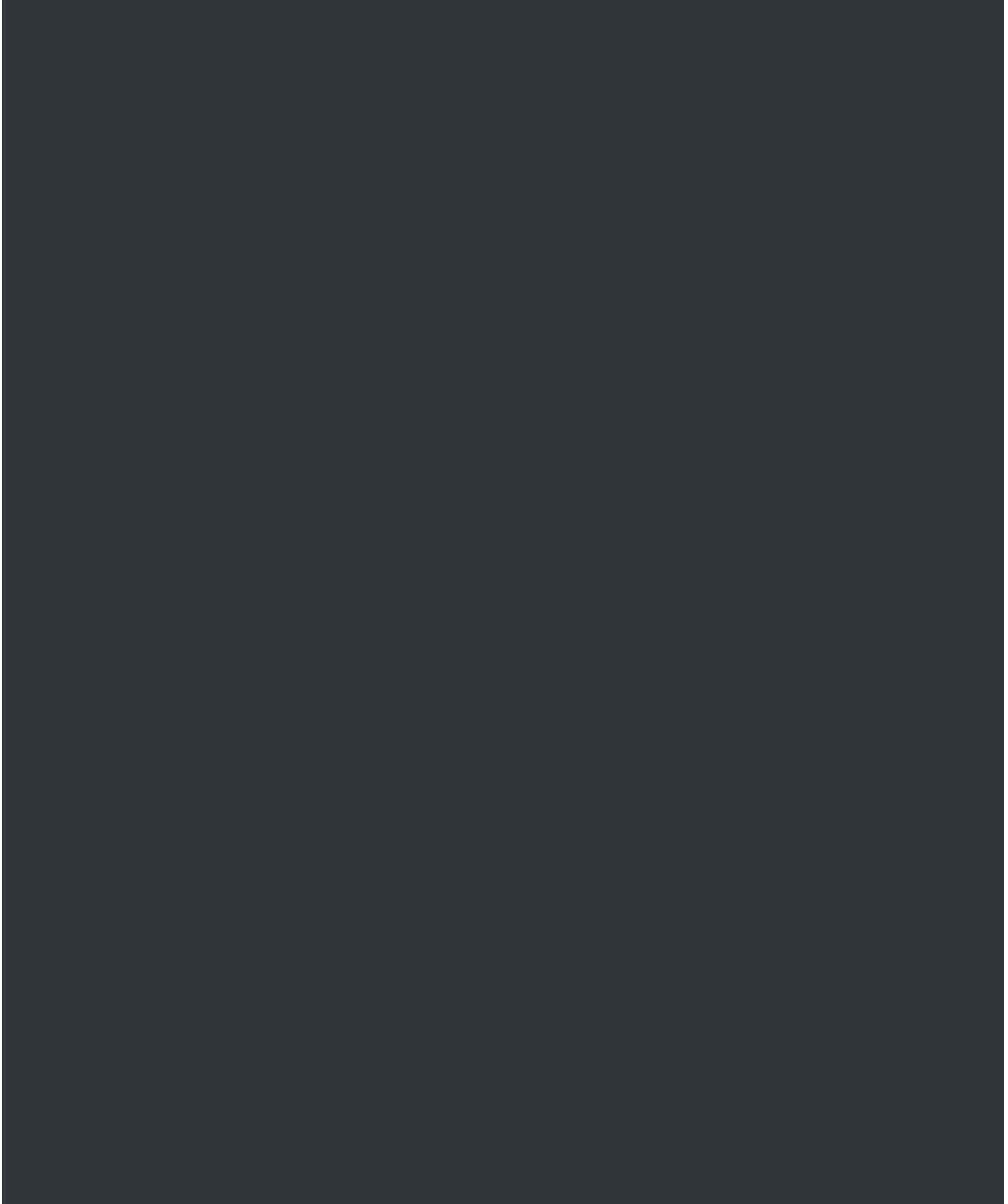
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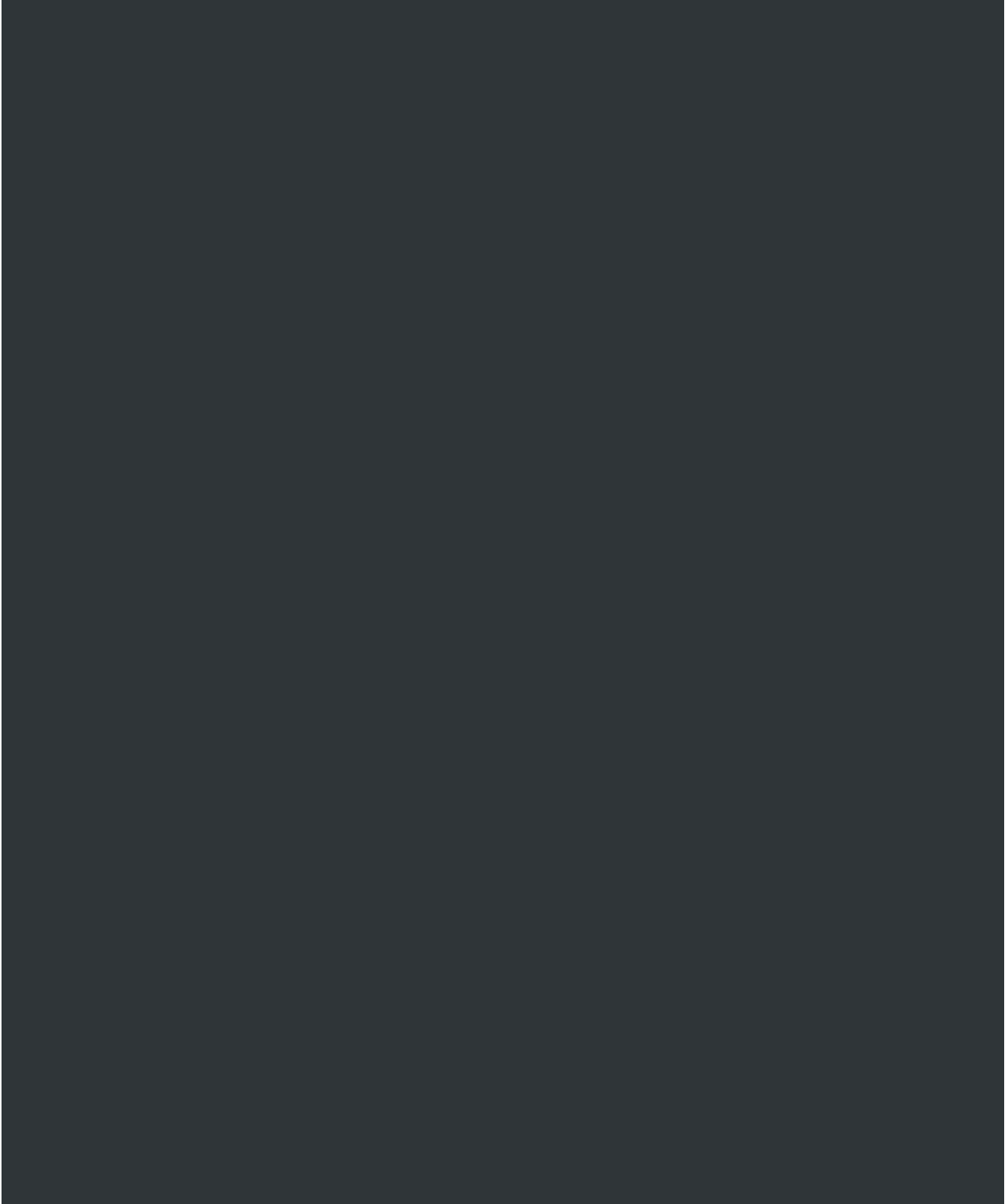
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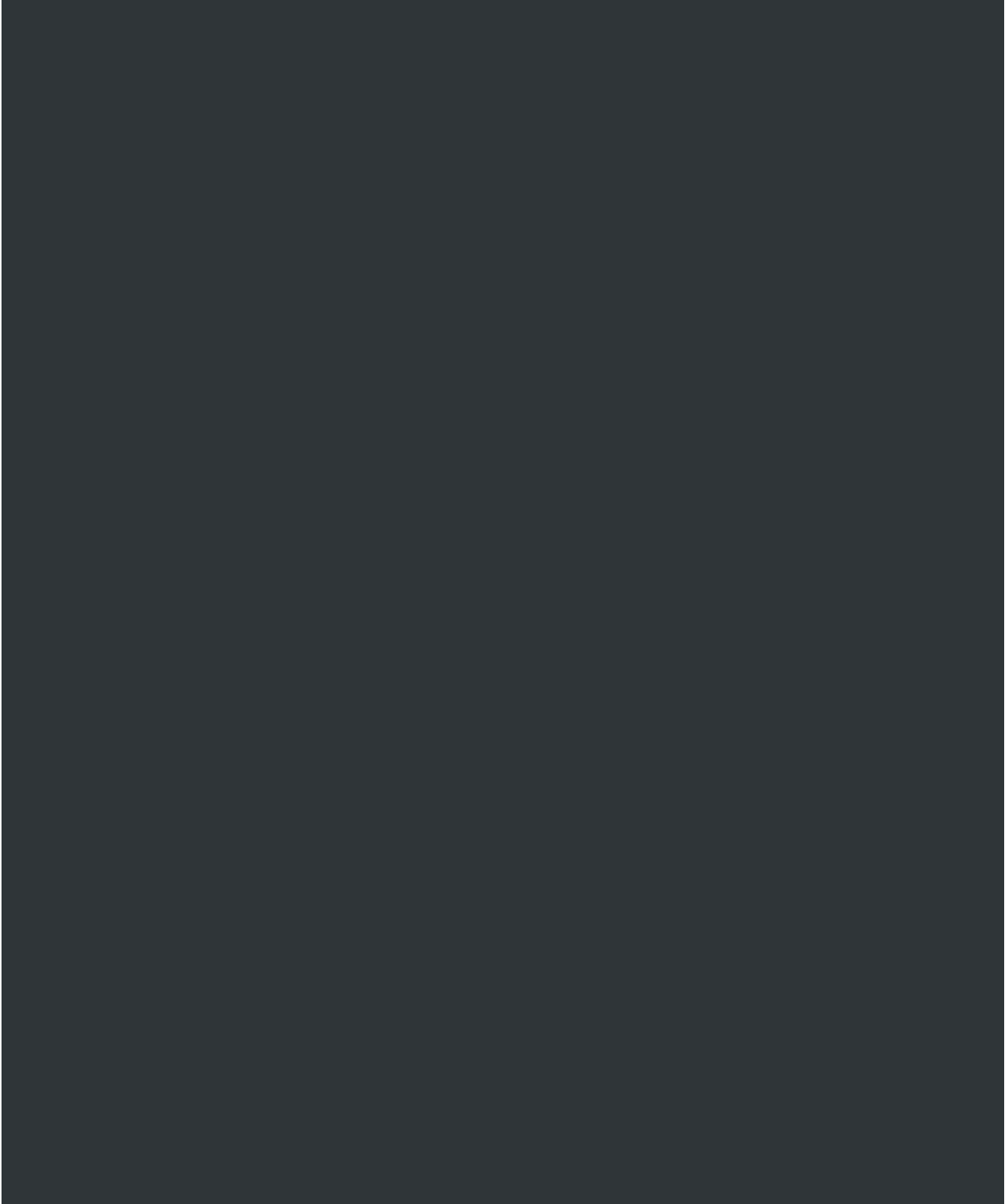
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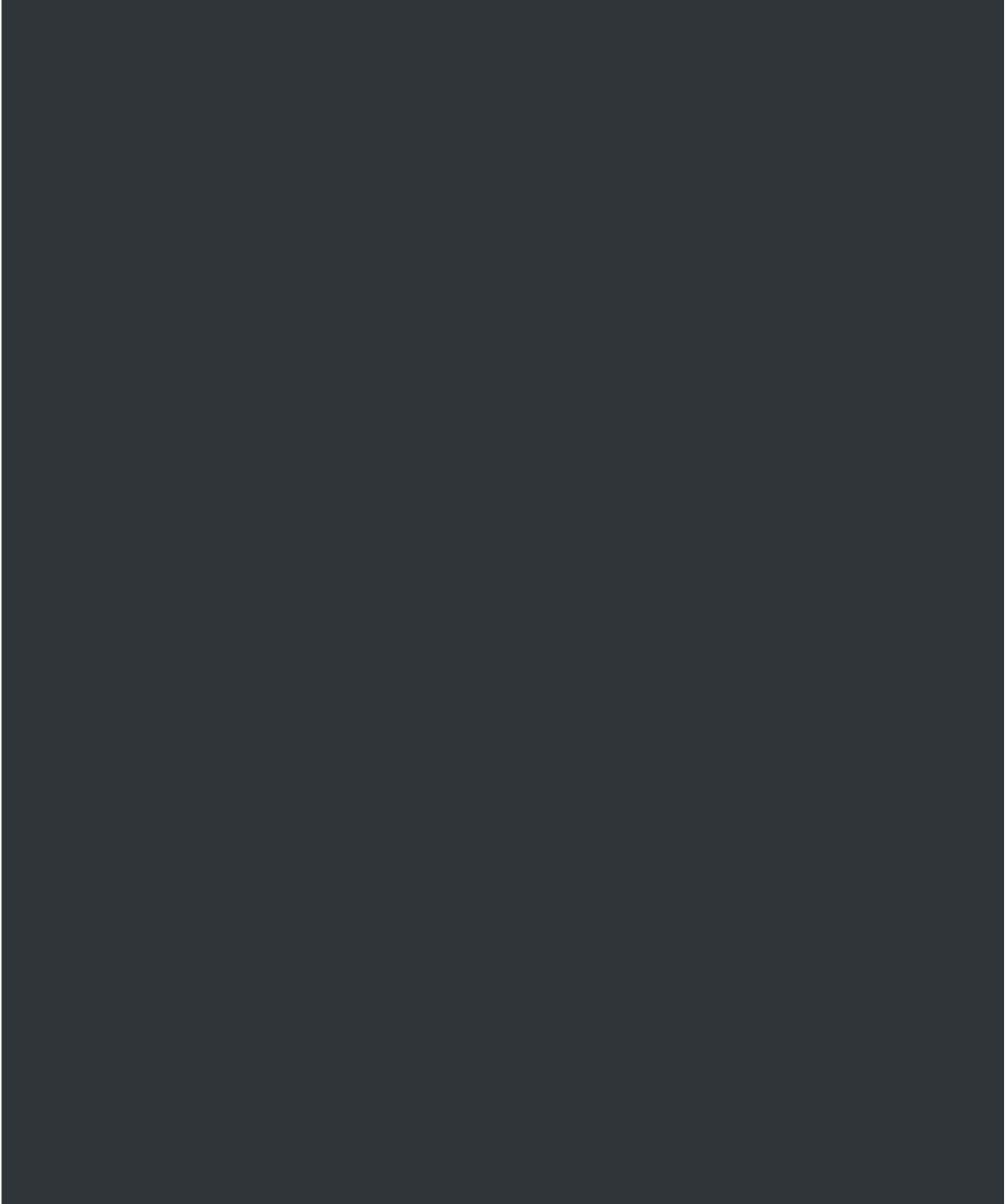
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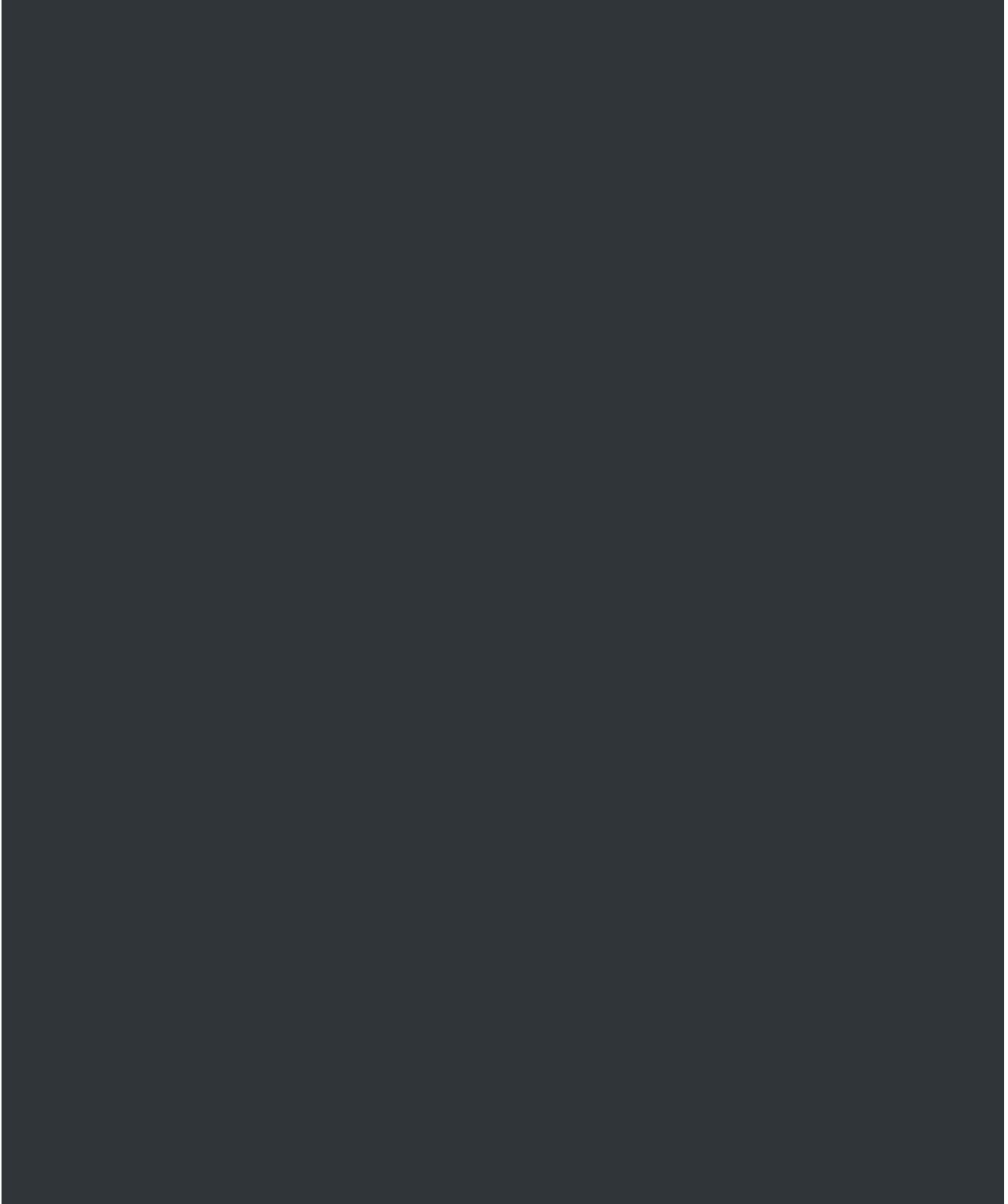
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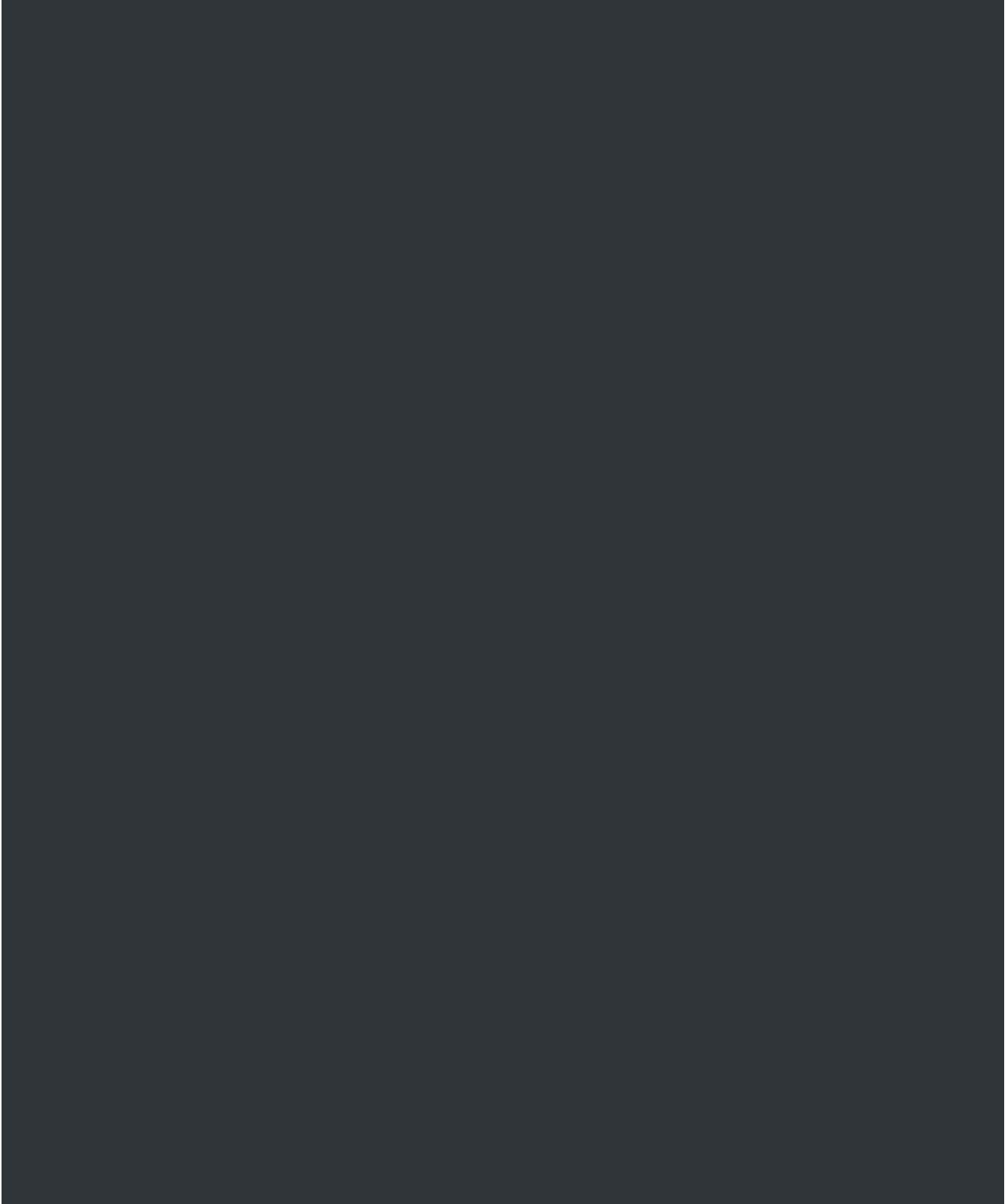
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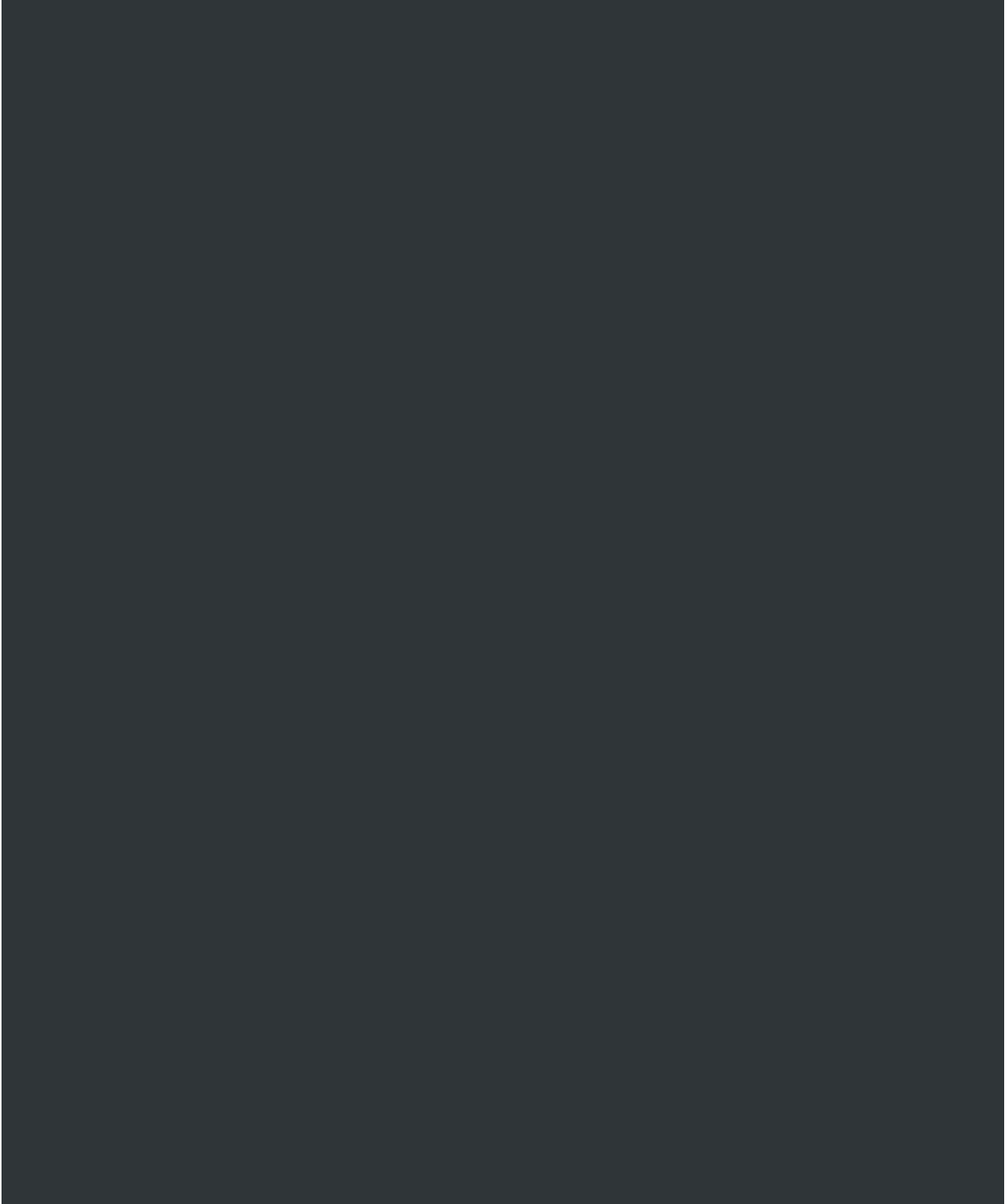
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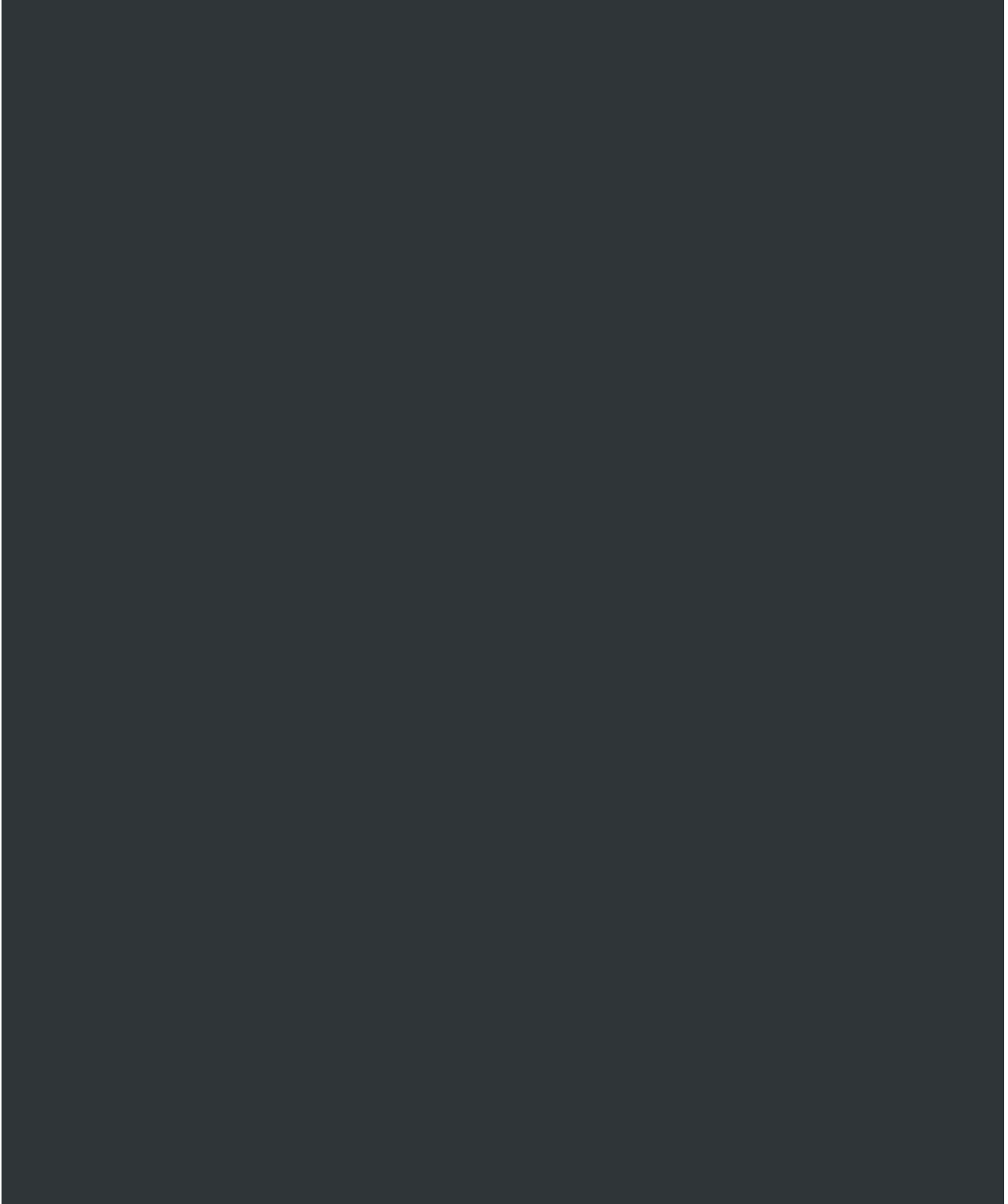
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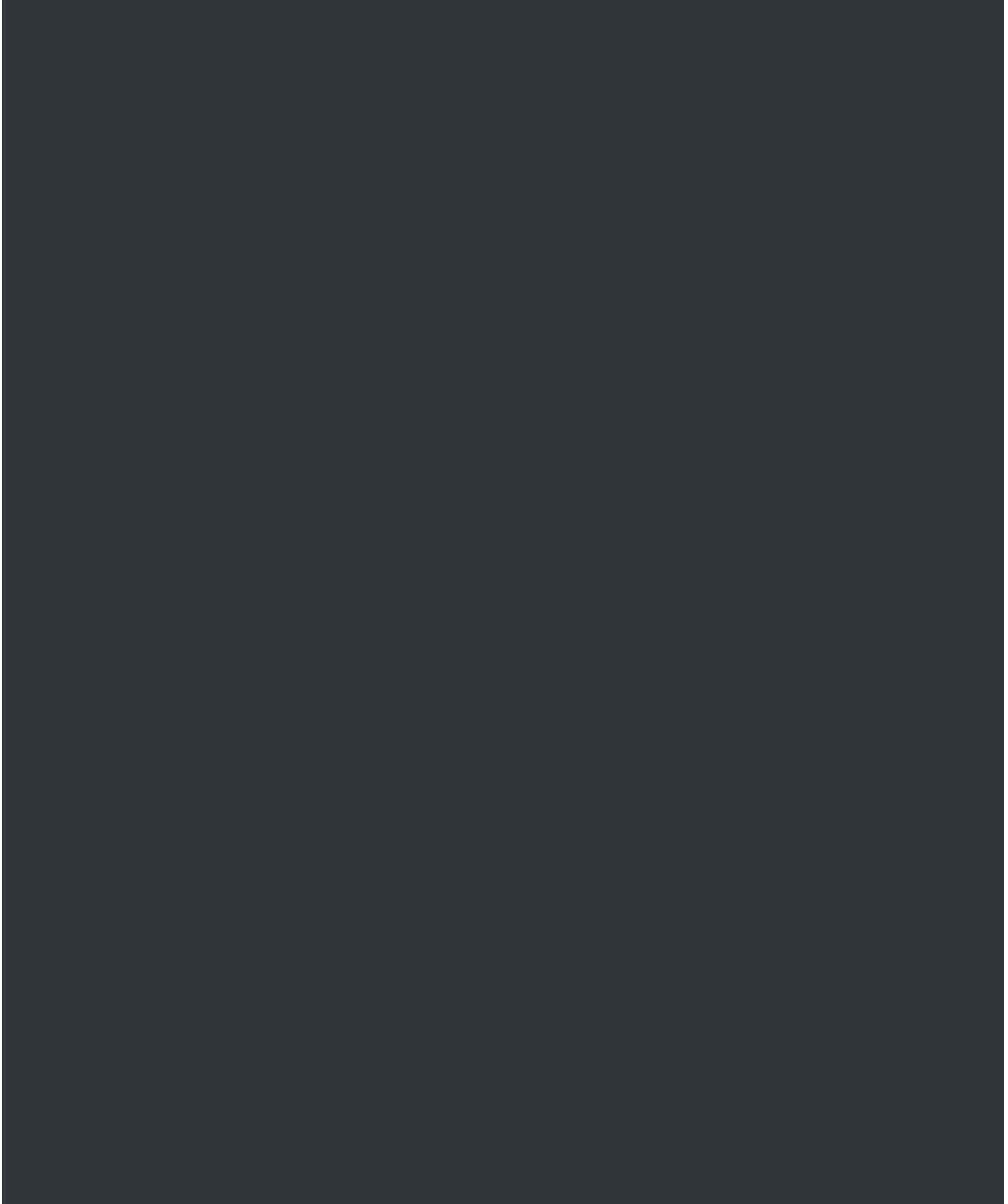
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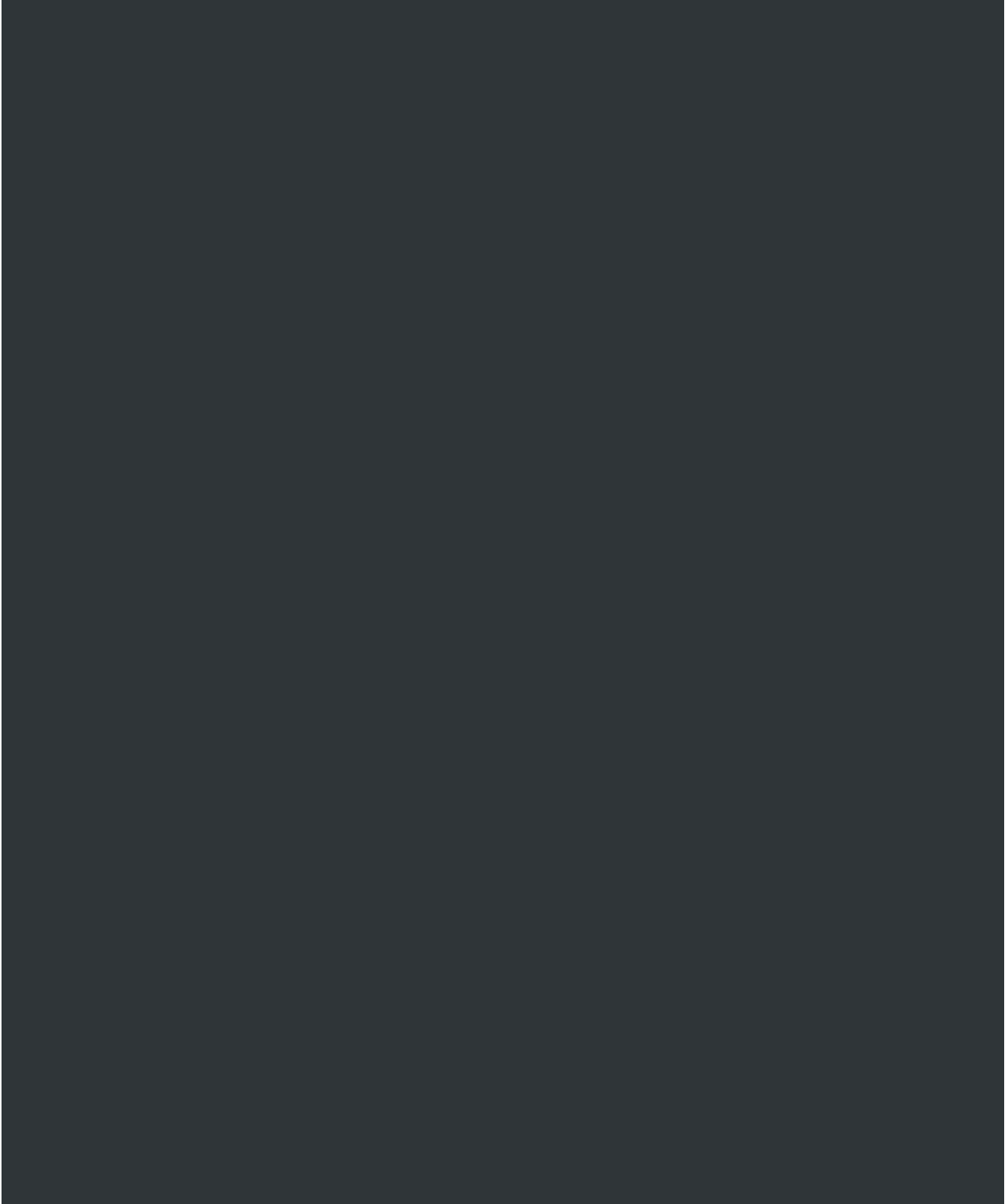
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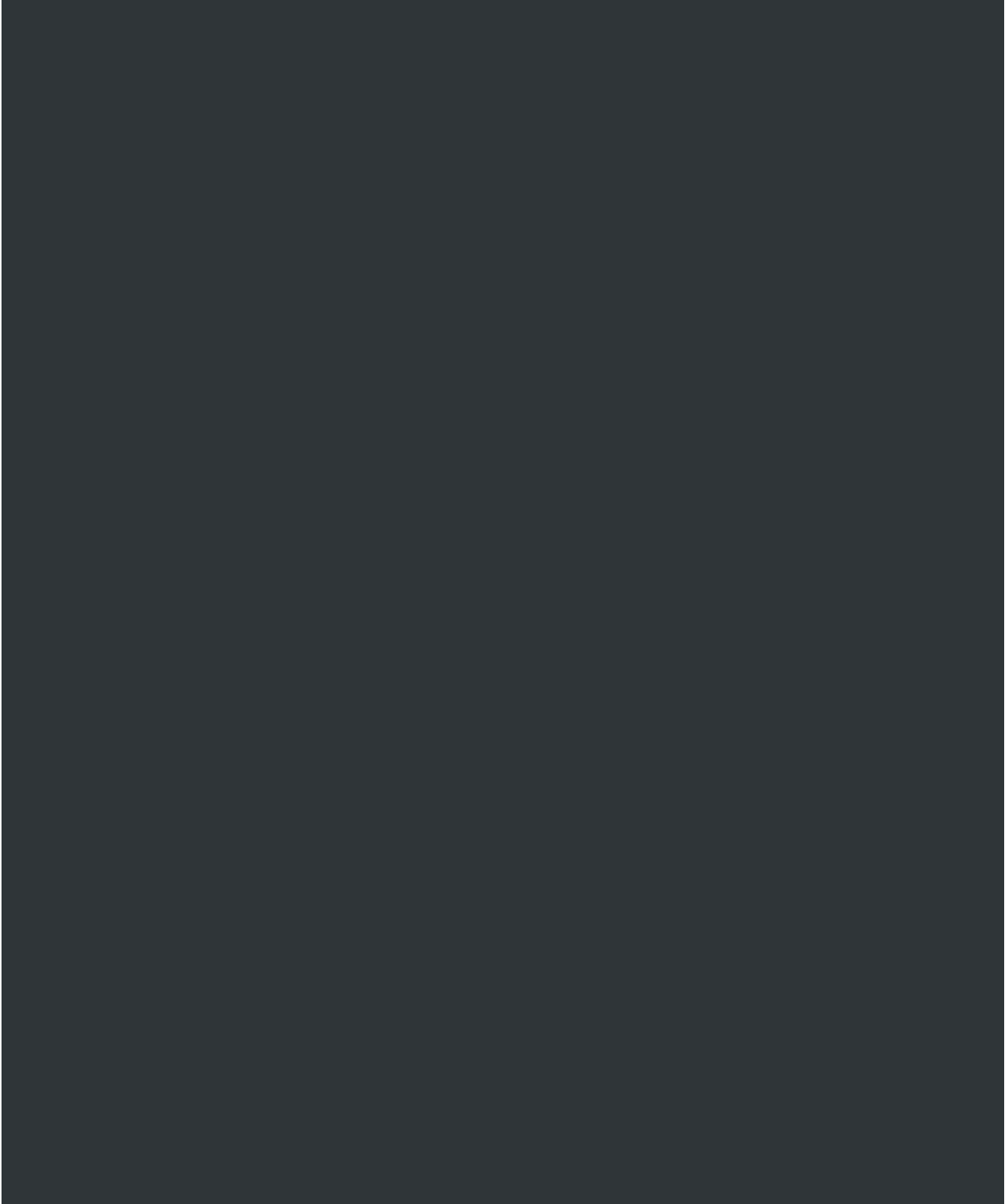
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APPENDICES



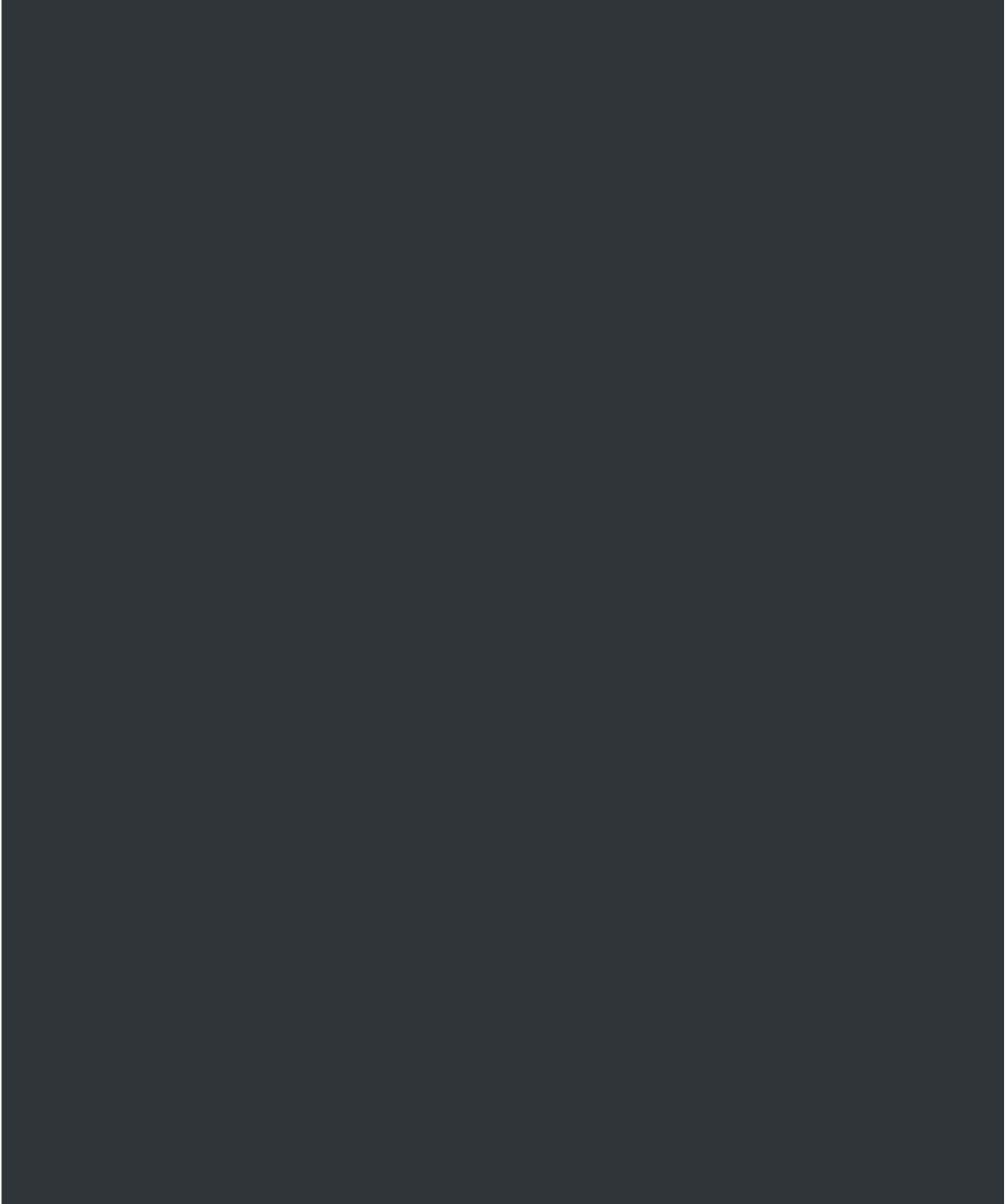
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APPENDICES



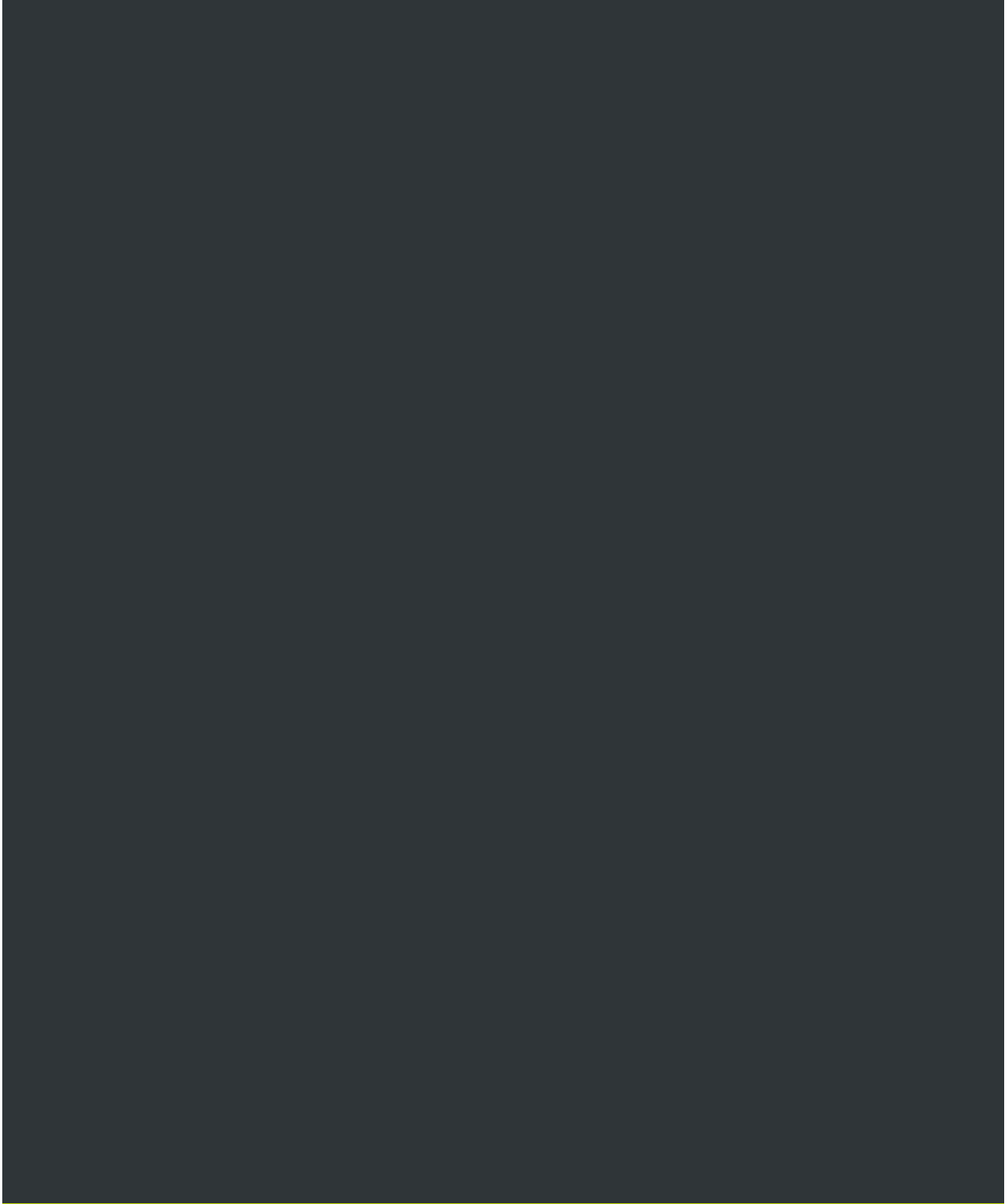
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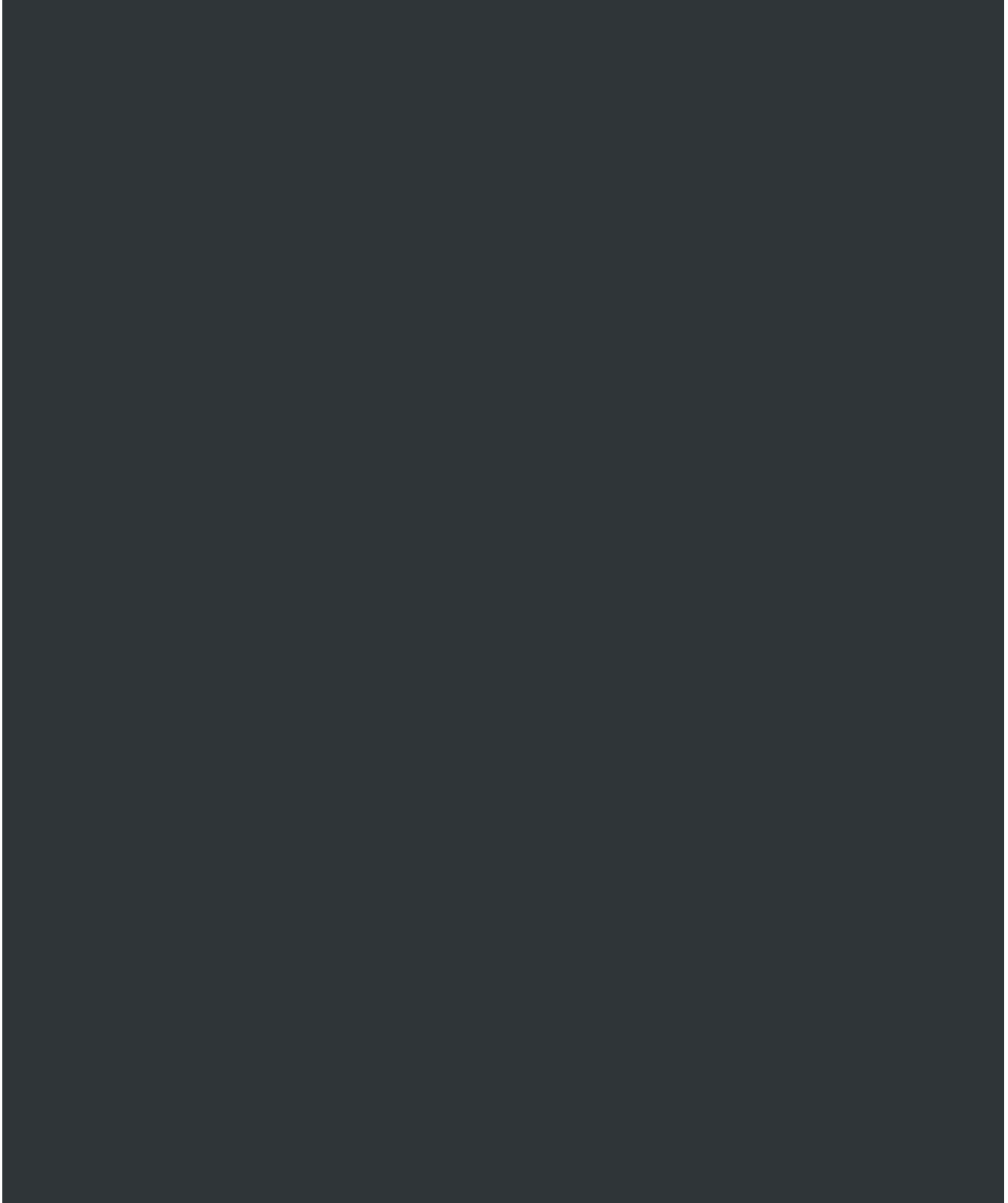
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APPENDICES



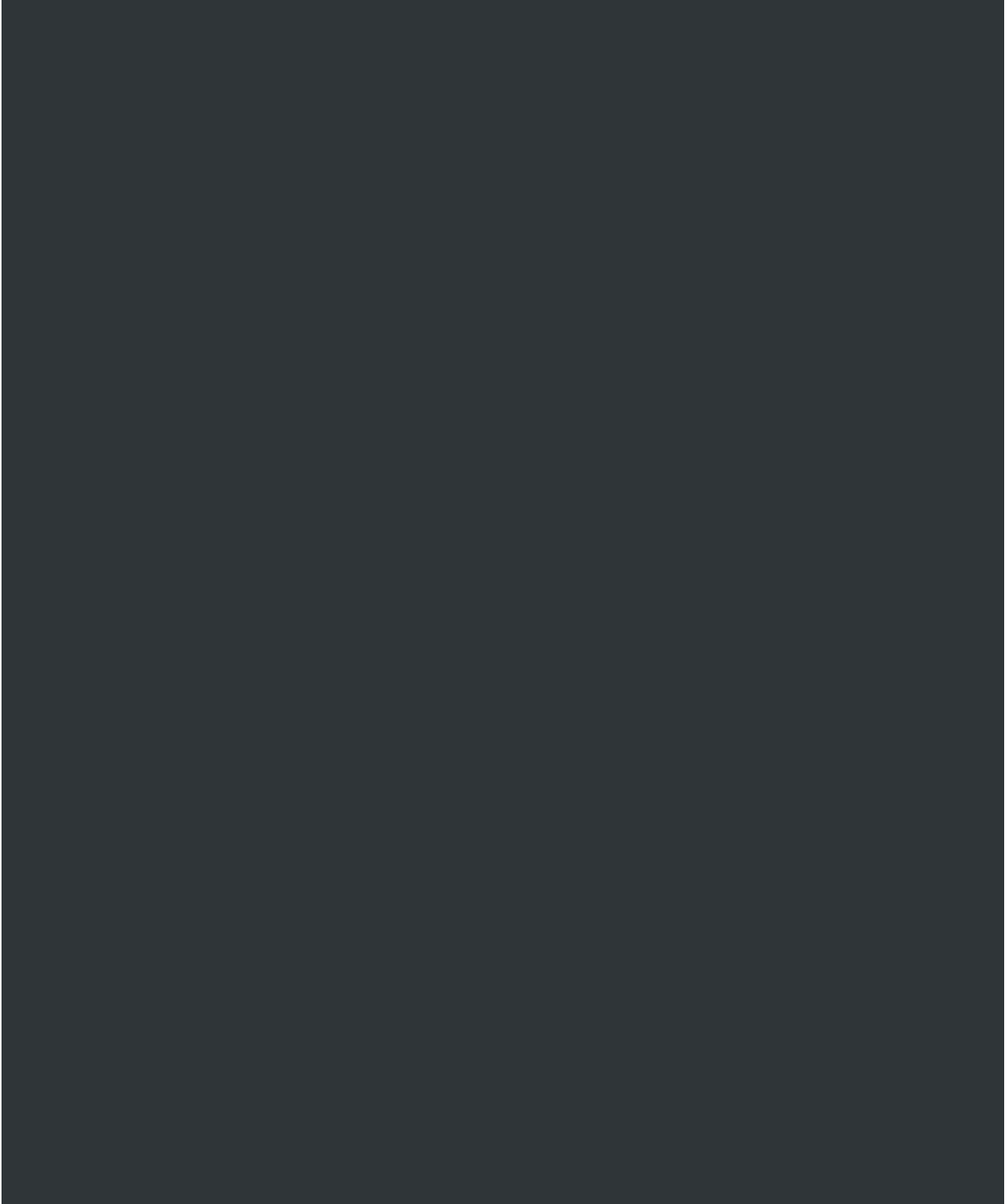
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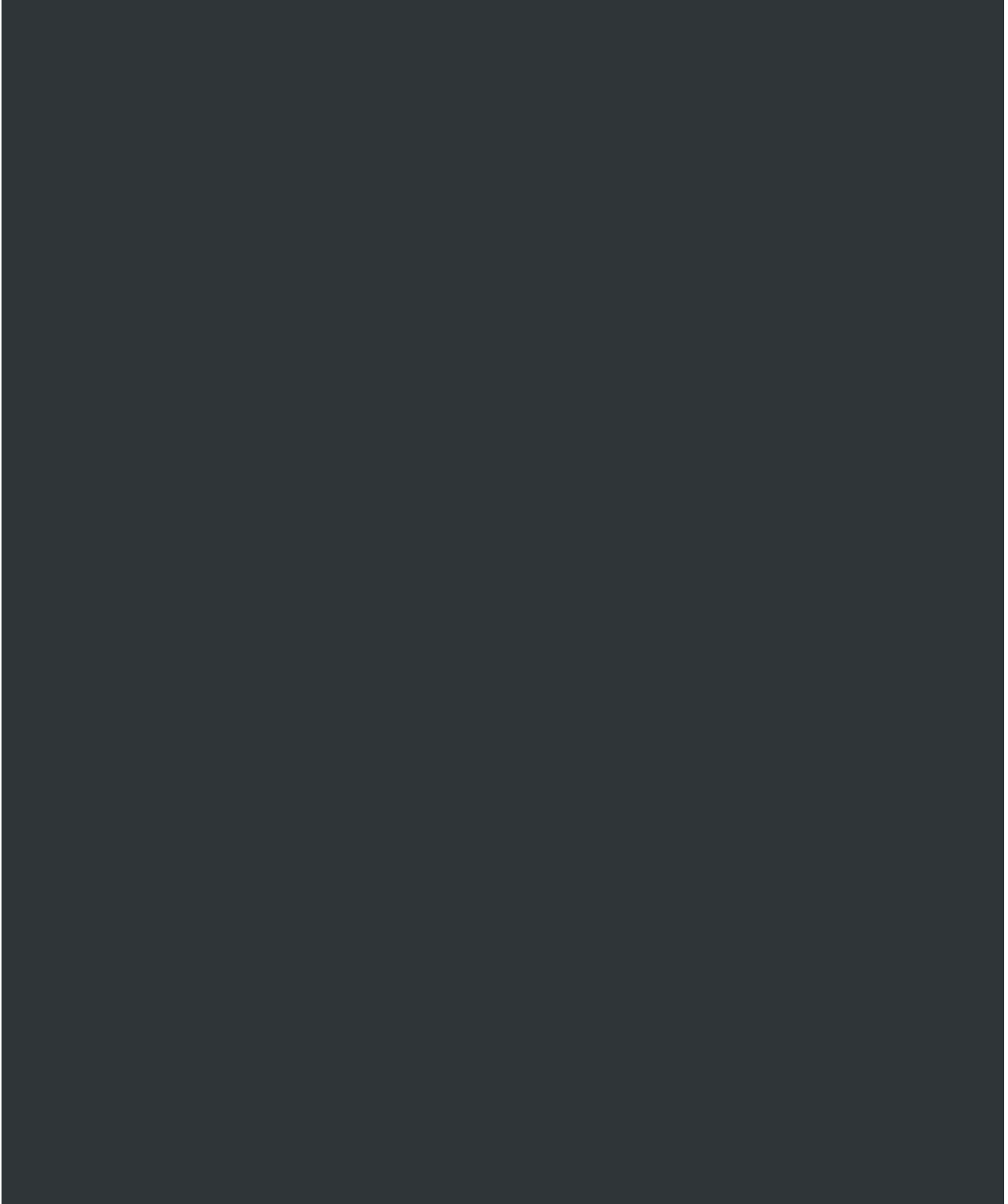
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