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Dear Sir,

Please find following a submission on the regulatory proposal and associated attachments lodged by the Power and Water Corporation (PWC) covering the next regulatory period, which is due to start on 1 July 2019 with a five year duration.

1. Efficiency and Economies of Scale

1.1. The Board's Strategic Directions

The Regulator's attention is drawn to the document: *The Board's Strategic Directions 2016-2020*, published by PWC in May 2016. This document can be found on the PWC web-site at this address:

https://www.powerwater.com.au/data/assets/pdf_file/0018/129051/The_Boards_Strategic_Directions_2016-2020.pdf

1.2. Efficiency Impacts of Having Four Regions

Due to history and geography, the regulated PWC distribution network consists of the discrete parts. PWC implies that this geographical happenstance will give the appearance of inefficiency, especially when compared to the more compact urban distributors in the southern and eastern states. Distributors providing services only in high-customer density environments are in the minority. The non-CBD serving distributors must maintain multiple depots to ensure service quality and responsiveness, just as PWC must. That the PWC network is in three parts is, therefore, immaterial.

1.3. Efficiency Benefits of Being a Multi-utility

Notwithstanding the relatively small scale of the PWC network, its role as a multi-utility providing regulated and unregulated services should result in increased efficiency insofar as indirect administrative costs. Due to the efficiencies of scale increase, the incremental administrative burden for an increase in operations beyond the regulated distribution services should be minimal. This does not imply that the regulated business should bear the whole costs as "stand-alone costs". Rather, the administrative costs should be spread across each of the operational groups, thereby improving the efficiency of costs borne by the regulated distribution business. This concept appears to be supported by PWC:¹

Advantages of Power and Water's multi-utility nature include scale and scope economies across corporate and operational capabilities, which in turn can deliver improved returns and reduce risk.

¹ *The Board's Strategic Directions 2016-2020*, section 4.2.3.

1.4. Economies of Scale in Statutory and Administrative Roles

PWC is one of the smallest distributors in the National Electricity Market in terms of customer numbers, network size and network demand. In the context of Australian businesses, however, PWC is not a small company. PWC as a whole has about one thousand employees;² the replacement cost of PWC's regulated distribution business asset base is multiple billions of dollars;³ and the replacement cost of assets associated with its other lines of business (unregulated electricity, water and sewerage, and the subsidiary company) is many times more.⁴

Irrespective of size, there are a number of statutory roles that must be filled. The associated costs are (relatively) unavoidable. But the roles are common across the regulated distributors in the national electricity market, so the costs are common across PWC's peers.

There are also a number of administrative functions that should be filled for efficient business operation: finance, personnel, legal, and so on. There is threshold where these functions can be provided by a single person: below this threshold, economies of scale do not apply. PWC as a whole exceeds by far the size at which these administrative functions can be provided by a single person. Therefore, PWC can realise economies of scale in overhead costs: this is recognised in a recent PWC Board publication:⁵

Advantages of Power and Water's multi-utility nature include scale and scope economies across corporate ... capabilities ...

1.5. Economies of Scale in Procurement

As a relatively small distributor, PWC is potentially less able to realise economies of scale in respect to procurement of network infrastructure components than its larger peers. But there is no prohibition on distributors partnering to obtain benefits from suppliers in the national economic regulatory regime. It would seem prudent, therefore, for PWC to partner with one or more distributors so that its customers can see the benefit of efficient expenditure. It would seem appropriate for the regulator to make a commensurate adjustment to expenditure forecasts.

2. Climate Effects

2.1. The Climate of the PWC Regulated Electricity Service Area

The PWC regulated service area has two distinct climatic regions:

- The Darwin-Katherine region is tropical, with relatively stable temperature but seasonally variable humidity and rainfall: very similar in climate to Far North Queensland, but with fewer tropical cyclones.
- The Alice Springs and Tennant Creek regions, being further south, experience significant seasonal temperature variation and much lower rainfall: similar to inland regions in Queensland and New South Wales.

It is not clear, therefore, why there should be a unique cost premium in the Northern Territory due to climate.

² PWC Annual Report, page 16

³ Based on the asset values and remaining lives presented in the PWC Post-tax Revenue Model.

⁴ PWC Annual Report 2017, Financial Statements and Explanatory Statements.

⁵ *The Board's Strategic Directions 2016-2020*, section 4.2.3.

2.2. The Effect of Humidity on Productivity

Research indicates that high humidity in conjunction with high temperatures creates a significant safety risk for people working outdoors. Mitigation of these safety risks may result in a decrease in apparent productivity.

In the Darwin-Katherine region, the danger period is between October and April. Outside of these months the humidity drops considerably, reducing the risks. The Alice Springs and Tennant Creek regions do not experience the extremes of humidity suffered in the Darwin-Katherine regions, although the temperatures are higher, which introduces its own risks.

From this, it can be inferred that the humidity in the PWC regulated service area:

- may have an impact on the productivity of field crews between October and April, but only when they are working in the field;
- should have minimal impact on field crew productivity between May and September when they are working in the field;
- will have no effect on the productivity of field crews when they are not working in the field;
- will have no effect on the productivity of office-based staff.

3. Change to Accounting Standards

3.1. General Effect

The accounting standard relating to leases⁶ provides that, as of 1 July 2019, certain leases of duration greater than 12 months should be recognised as an asset. This provision means that expenditure associated with these leases is properly (in accounting terms) capital expenditure rather than operating expenditure as it has been previously.

While treating operating leases as capital expenditure is logical from an accounting point of view, it creates issues from a regulatory point of view. Capital expenditure is added to the regulatory asset base, and the regulated business then receives return on and return of investment. The return of investment should be conceptually equal to the lease costs, and so be equivalent to an equal value of opex. The return on investment, however, creates a new revenue stream for the regulated business, despite the fact that there is no capital investment, *per se*.

This new accounting approach also removes incentive to seek out efficient lease costs: the higher the lease costs, the more revenue results; the lower the lease costs, the lower the revenue.

In addressing this issue, it would seem appropriate to:

- consider the capitalised leases as a component of opex, to be tested for efficiency with the rest of the opex; and, subsequently,
- capitalise an amount of efficient lease opex such that the net present value is zero, having consideration for return on and of investment.

⁶ AASB 16, published by the Australian Accounting Standards Board.

3.2. PWC's Approach

As a consequence of the change to accounting standards, PWC has:

- treated lease costs in the next period, which starts on 1 July 2019, as capital expenditure; and
- included the residual value of existing leases as capital expenditure in the first year of the period. so that their value appears in the regulatory asset base.

As noted above, this will increase the revenue stream for PWC by an amount equal to the return on investment of those leases (and some borrowing costs). In the case of the existing leases, this seems to be a windfall gain.

It is suggested that the incremental revenue resulting from this change to accounting standards be treated so that customers do not see an increased revenue as a consequence of a regulatory change rather than an increase in service provided by the business.

4. Capitalisation of Overheads

In their forecasts of expenditure for the next period, PWC has implemented a new approach to the capitalisation of overhead expenses: a fraction of indirect costs are treated as capital and added to the regulatory asset base. This approach, while consistent with that used by other regulated network companies, does not provide a good incentive upon PWC to minimise its overhead costs. The capitalised overheads will be subject to the usual treatment in the regulatory asset base so that PWC will receive a return on and return of investment on expenses, a quantum of which may be considered inefficient were it to be treated as opex.

To counteract this, because the overheads are properly opex, it is suggested that the capitalised overheads should be added back into the PWC opex forecast, which is then subject to the usual assessment of prudence and efficiency by the AER. Only then, when satisfied that the expenditure is prudent, should the capitalisation amount be added to the regulatory asset base. In this way, only prudent and efficient overheads are capitalised, which is consistent with the economic regulatory framework.

5. Related Party Transactions

PWC is owned by, and obtains services from, the Government of the Northern Territory. As a user of these services, PWC must pay for them. It is expected that the majority of services are obtained from the Department of Corporate and Information Services (DCIS). Each year, DCIS publishes an Annual Report. The Annual Report for 2016-17 shows that DCIS made a significant profit in that financial year.⁷ PWC, as a user of DCIS services, will have contributed to this profit. Therefore PWC's customers will have contributed to this profit.

These payments have the appearance of "related party transactions", and should be dealt with according to regulatory precedent.

6. Confidentiality Effects

As a general comment, it is difficult to gain a good understanding of the proposals given PWC's proclivity to censor expected costs.

⁷ See http://www.nt.gov.au/dcis/annual_reports/index.shtml

7. Opex Forecast

This section contains brief comments on the PWC operating and maintenance expenditure forecast for the base year of the next period.

- The total amount of operating and maintenance expenditure is rather large for a small distributor. When the capitalised overhead costs are considered, the value grows considerably.
- The operational costs (vegetation management, emergency expenditure, and maintenance) appear reasonable.
- It is not clear that the efficiencies arising from ICT initiatives are recognised.
- It is not clear that the reductions in maintenance due to asset replacement and new asset construction activities are recognised.
- Service Level Agreement expenses are for the provision of distribution services by another division of PWC. It is not an arm's length arrangement.

8. The Relative Impact of Short Service-Life Assets on Customer Pricing

The acquisition of short service-life assets has a much higher relative impact on end-use customer prices than the acquisition of long service-life assets. Therefore, proposed (and actual) capital expenditure on short service-life assets (such as vehicle fleet and information technology) should be subject to a higher degree of scrutiny to ensure that the impact on customer pricing is optimised and the National Electricity Objective is met.

Suppose that a long service-life asset has an expected service life of 40 years, and a short service-life asset has an expected service life of 5 years. Then, over the service life of the long service-life asset, the short service-life asset would be replaced eight times.

Suppose further that the value of each asset is \$1 million. Ignoring the effects of inflation, over the service life of the long service-life asset:

- the capital investment in the long service-life asset would be \$1 million;
- the capital investment in the short service life asset would be \$8 million.

This investment is recovered by the distributor through the following revenue components:

- depreciation;
- rate of return; and
- borrowing costs.

Despite an equal initial investment,

- over the life of the *short service-life assets*, the revenue components due to the acquisition of short service-life assets will be larger than those due to the acquisition of long service-life assets:
 - the depreciation component will be significantly larger because the whole of the initial investment of the short service-life assets will be recovered, while only a portion of that of the long service-life assets will be recovered;
 - the rate of return component will be identical;

- the borrowing costs may be larger, although this depends business' approach to debt financing.
- over the life of the *long service-life assets*, the revenue components due to the acquisition of short service-life assets will be larger than those due to the acquisition of long service-life assets:
 - the depreciation component will be significantly larger because more costs must be recovered;
 - the rate of return component will be larger due to the periodic "resetting" of the asset value;
 - the borrowing costs will be larger because more money must be borrowed;

It can be seen that the acquisition by a distributor of short service-life assets has a much higher relative impact on revenue than acquisition of long service-life assets. Therefore, the acquisition of short service-life assets has a much higher relative impact on end-use customer prices than the acquisition of long service-life assets.

9. Demand and Consumption Forecast

PWC engaged the Australian Energy Market Operator to produce the forecasts of demand and consumption for the next period. The forecast method⁸ considers the forecast number of new connections to the PWC networks. Apart from some known large load movements, the underlying assumption appears to be that the existing connections continue their consumption and demand patterns. This assumption may lead to over-estimation of the forecasts because it does not take into account the vacancy rates in rental properties, which are likely to increase significantly with the end of a significant construction project in Darwin in 2017/18. These rental properties are unlikely to be filled and, as investment properties, unlikely to be sold for permanent accommodation. Consequently, the consumption and demand of these vacant properties will fall to zero. It is expected that new residential connection will continue unabated.

10. Network Technical Code and Planning Criteria

PWC uses compliance obligations created in the *Network Technical Code and Network Planning Criteria*⁹ to justify many expenditure forecasts. This document is created by PWC and approved by the Utilities Commission under the Electricity Reform Act (NT). Despite regulatory endorsement, it is not clear that the obligations within have been developed using economic principles or with a local equivalent to the National Electricity Objective in mind. Accordingly, "blind compliance" may lead to an inefficient outcome, especially given that,¹⁰

If the Network Operator fails to arrange or control any act, matter or thing or the acts of any other person notwithstanding the use of the Network Operator's reasonable endeavours, the Network Operator will not be taken to have breached such obligation.

⁸ PWC Regulatory Proposal Attachment 04.5

⁹ PWC Regulatory Proposal Attachment 04.2

¹⁰ Network Technical Code and Planning Criteria, 4.3.2(c)

11. Capex Projects

11.1. PWC Regulatory Proposal Attachment 13.1P: Construct Wishart Zone Substation PWC Regulatory Proposal Attachment 13.3P: Archer Zone Substation Augmentation PWC Regulatory Proposal Attachment 13.10P: Replace Zone Substation

These attachments relate to the construction of a new zone substation at Wishart, the augmentation of Archer zone substation, and the replacement of the Berrimah zone substation.

- These three projects appear to be closely related to each other.
- It is not clear that an attempt has been made to optimise a combined solution for these three.

11.2. PWC Regulatory Proposal Attachment 13.4P: Darwin Transmission Line Upgrading

This attachment relates to a project to “uprate” the Darwin transmission lines:

- The forecast expenditure is to address a safety issue: inadequate clearance due to increased line sag when operating at the designed and contingency conductor ratings.
- There is no indication that the transmission lines are being operated at their design rating or that they will ever be operated at their current rating.
- The original survey was completed in 2007, with additional modelling performed since then.¹¹ Despite this being a known, on-going safety issue, work is not expected to commence until at least 2019.¹²

11.3. PWC Regulatory Proposal Attachment 13.5: Power Quality Compliance Program

This attachment relates to works to address power quality issues, predominantly voltage-related, in the distribution network:

- This project appears to duplicate the Network Planning project in the ICT Capital Expenditure plan.¹³

11.4. PWC Regulatory Proposal Attachment 13.6: Darwin 132/66kV Transformer Capacity Upgrade

This attachment relates to capital expenditure to acquire a spare transformer to be held at Hudson Creek to mitigate the concurrent failure of two transformers at that site.

- Although concurrent failure of two transformers at Hudson Creek is extremely unlikely, given the criticality of Hudson Creek to the supply of Darwin-Palmerston, mitigation is sensible.
- Acquisition of a spare transformer and storage at Hudson Creek seems to be an efficient approach.

¹¹ PWC Regulatory Proposal Attachment 13.4P, Section 3.2

¹² PWC Regulatory Proposal Attachment 13.4P, Section 9.4, 11.1.1

¹³ PWC Regulatory Proposal Attachment 13.43P, Section 6.2.3

11.5. PWC Regulatory Proposal Attachment 13.7: Overloaded Feeders / Distribution Augmentation Program

This attachment relates to a project mitigate future excessive loading of feeders from the Archer, Berrimah and Alice Springs zone substations.

- The Archer and Berrimah feeder work seems to be associated with other PWC forecast capital work:
 - 13.1P: Construct Wishart Zone Substation
 - 13.3P: Archer Zone Substation Augmentation
 - 13.10P: Replace Zone Substation
- It would seem reasonable to include consideration of this project in a combined, optimised solution.

11.6. PWC Regulatory Proposal Attachment 13.9P: Energy Management System

This attachment relates to works to upgrade or replace the Energy Management System.

- It is rather difficult to draw conclusions due to the amount of censorship in the document.
- It is not clear whether PWC as the regulated distributor is the only user of this system.¹⁴ If not, costs should be shared amongst users.

11.7. PWC Regulatory Proposal Attachment 13.13P: Replace Port Feeder

This attachment relates to the project to replace the aged feeder supplying the East Arm port area from Berrimah zone substation.

- This seems to be associated with other PWC forecast capital work:
 - 13.1P: Construct Wishart Zone Substation
 - 13.3P: Archer Zone Substation Augmentation
 - 13.7: Overloaded Feeders / Distribution Augmentation Program
 - 13.10P: Replace Zone Substation
- It would seem reasonable to include consideration of this project in a combined, optimised solution.

11.8. PWC Regulatory Proposal Attachment 13.15P: Katherine Voltage Rectification

This set of attachments relates to an approach to control voltages on the Katherine sub-network.

- In section 3.3 of the attachment, the issue is described:
 - At time of light loading, especially overnight, there will be high voltages seen at the Katherine 132kV substation.
 - These high voltages seen at the Katherine 132kV substation result in high voltages in the 22kV and 415V networks in Katherine.

¹⁴ It appears that System Control in its market operator role may be able to use the information for dispatch and control of the power system.

- Amongst other things, these over-voltage events “reduce the ability for customers to operate rooftop solar systems”.
- It is relatively unusual for photo-voltaic systems to generate at night.
- It is also more common for localised high voltage caused by adjacent photo-voltaic systems generators to limit operation of a given photo-voltaic system.
- The proposed solution will not address this latter issue, but will lower the overall Katherine system voltage.
- Lowering the Katherine system voltage may have other, adverse effects, and may cause breaches of the lower limits of system voltage resulting in the need for further expenditure, which is not considered in the attachment.
- There is a contradiction in the attachment:
 - The preferred option used in the forecast (option 2) is to install “switched reactive compensation”.
 - Appendix D to the attachment (in part 2 of 4) states that option 4, “contract Katherine Power Station to provide voltage control services” is the preferred option.

11.9. PWC Regulatory Proposal Attachment 13.16P: Alice Springs Corroded Poles

This attachment relates to works to inspect and treat corroded steel poles in the Alice Springs area.

- The forecast is \$17.4M (\$15.5M in the next period) to inspect 2,175 poles and treat 936 poles. This seems expensive.
- Inspection of poles is generally operating and maintenance expenditure.
- It is not clear why safety risk mitigation is spread over the five years of the next period.

11.10. PWC Regulatory Proposal Attachment 13.24P: Darwin Northern Suburbs HV Cable Replacement PWC Regulatory Proposal Attachment 13.25: LV Cable Replacement Cullen Bay and Bayview

These attachments relate to the replacement of existing cables that are failing prematurely in the Darwin region.

- Since these cables are failing and being replaced well before the end of service life, the value of the replaced cables should be removed from the regulatory asset base. It would be inappropriate for PWC to continue to receive return on and of investment, which translates to revenue, for prematurely failed assets.

11.11. PWC Regulatory Proposal Attachment 13.26: Lake Bennett Feeder Clearance Rectification

This attachment relates the project to remediate the Lake Bennett feeder, which has multiple issues.

- Some of these assets are being replaced well before the end of their service life – the value of these should be removed from the regulatory asset base. It would be inappropriate for PWC to continue to receive return on and of investment, which translates to revenue, for a prematurely failed asset.
- “Asset removal and disposal” are listed as project costs in Options 2 and 3.¹⁵
 - These are direct opex. They should not be considered as capital expenditure for regulatory purposes – no asset is being built, so there should be no return on and of investment.
 - There should be some residual scrap value for the steel poles and metallic conductor.

11.12. PWC Regulatory Proposal Attachment 13.27: Darwin Distribution Substation Fault Level Replacement Program

This attachment relates to the project to replace a type of switchgear that is being operated beyond its design capacity, thereby introducing a safety risk.

- It is not clear why safety risk mitigation is spread over the five years of the next period.

11.13. PWC Regulatory Proposal Attachment 13.28: Single Phase Substation Refurbishment Program

This attachment relates to the project to refurbish single-phase underground distribution substations in the Darwin urban area, the population of which is exhibiting premature failure.

- It is not clear why refurbishment of these devices, with an expected life extension of 10 years (which actually brings it close to its expected service life) is preferred over complete replacement of these devices with an alternate mounting option. It would seem that the refurbished devices will suffer the same weaknesses as the original installations.
- Expenditure for refurbishment should be treated as opex. It would qualify as capex if it significantly extended the service life of the asset, but the assumption is that the asset will actually reach its service life unaided.

11.14. PWC Regulatory Proposal Attachment 13.32: All Regions Poorly Performing Feeder Improvement Program

This attachment relates to works to address the reliability of the most poorly performing feeders to ensure compliance with jurisdictional reliability targets.

- The regulator traditionally does not provide funding for reliability expenditure. This excellent precedent should continue.

¹⁵ PWC Regulatory Proposal Attachment 13.26P, Section 4

11.15. PWC Regulatory Proposal Attachment 13.43P: ICT Capital Expenditure

This attachment relates to the capital expenditure associated with Information and Communications Technology, but not that associated directly with control of the power network.

- ICT is a short service-life asset. Section 8 of this document is relevant.
- PWC has a number of Tier 1 IT products, which have an associated cost premium for installations and upgrades. Given the small size of the PWC customer-base, the “price” aspect of the National Electricity Objective takes on a greater significance. PWC has not demonstrated that upgrading the Tier 1 systems is more efficient than replacement with systems that are scaled more appropriately to a business of the size of PWC.
- The Outage Management System (section 6.2.5 of the attachment) seems to duplicate parts of the Energy Management System.¹⁶
- It is not clear that PWC has an obligation to perform the System Operation functions noted in section 6.2.7 of the attachment. The functions are not standard distribution services, and do not seem to be in the Framework and Approach for PWC.
- Remediate the Core (section 6.3 of the attachment). The name implies that the initial implementation of the systems was less efficient than it could have been. It is not clear why the customers of PWC should have to finance a major correction.
- It is not clear how a Customer Relationship Management system of the type described in section 6.5.3 of the attachment meets any of the National Electricity Objectives.

11.16. PWC Regulatory Proposal Attachment 13.44: Vehicle Fleet Program

This attachment relates to the capital expenditure associated with the vehicle fleet.

- The majority of the fleet is leased from NT Fleet, which is part of the NT Government. Section 5 of this document is relevant.
- There is a large expenditure in the first year of the period associated with the capitalisation of leases. Section 2 of this document is relevant.

11.17. PWC Regulatory Proposal Attachment 13.45: Property Leases

This attachment relates to the capital expenditure associated with leasing property.

- There is a large expenditure in the first year of the period associated with the capitalisation of leases. Section 2 of this document is relevant.

¹⁶ PWC Regulatory Proposal Attachment 13.9P