# Future Energy Network Forum

CitiPower, Powercor and United Energy

Special Interest Group (SIG) Stakeholders

January 2024

CitiPower Powercor Australia united energy | Forethought Outcomes

# Introduction

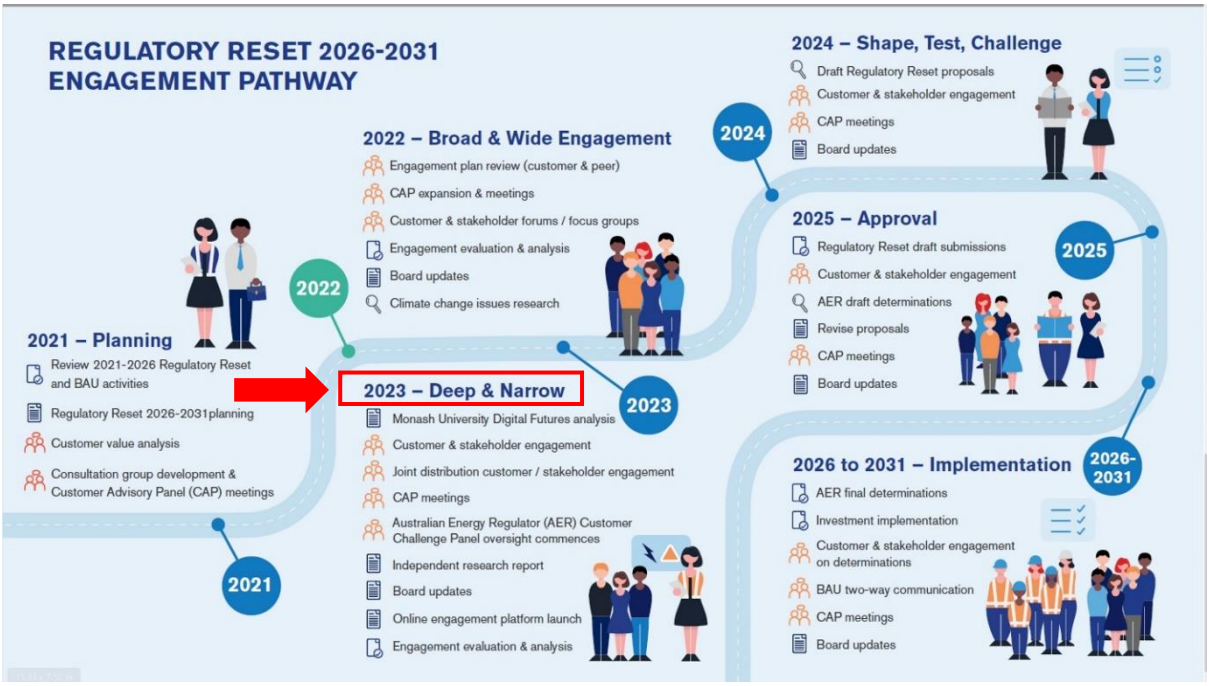
**Regulatory Reset Engagement Program (2026-2031)**

In support of the regulatory reset proposal development, a comprehensive community engagement initiative was conducted throughout 2022 and early 2023. This extensive program identified the primary needs and preferences of customers, categorising them into four themes:

- Affordability and equity
- Reliability and resilience
- Energy transformation
- Customer experience

Building upon this broad and wide research, the focused and in-depth engagement employs a targeted approach to explore, test and understand customer preferences and priorities. Refer to the accompanying graphic for a visual representation of the Regulatory Reset Engagement Pathway.

Upon a thorough examination of these customer outcomes, the insights garnered will inform subsequent phases of the 2026-2031 regulatory reset proposal development. This involves the formulation and evaluation of business cases aligned with the identified customer outcomes.




**Forethought's Involvement**

Forethought is an independent Marketing, Analytics and Strategy organisation with teams that specialise in Research and Engagement within multiple industries, including Utilities.

Forethought's experience in the energy industry involves conducting customer and stakeholder research and engagement with organisations across the full value chain including electricity generation, distribution, transmission and retail services. They partner with clients to provide an independent customer voice, ensuring that the customer is always at the forefront of organisational decision making.

Forethought was selected for this program based on their expertise across both Utilities and Research/Engagement capability to independently design and facilitate engagement forums and objectively report back on the needs and preferences of customers across the network.

# Objectives and Methodology

**2026-2031 Regulatory Reset Objective**
Develop a Regulatory Reset Proposal that aligns with the needs and preferences of a diverse customer base.

**Engagement Objectives**
CPPALUE prepared a number of scenarios relating to future energy network requirements and sought engagement with a range of special interest group stakeholders across CitiPower, Powercor and United Energy:

- Explore, discuss and debate the differences across scenarios relating to scenario assumptions and uncertainties ("assumptions" refers to assumptions for customer usage e.g., EV profiles, battery charging/discharging profiles etc.)
- Identify nuances by network
- Share additional uncertainties by scenario and network for consideration
- Align on the most likely future energy scenarios, by network, for CPPALUE to feed into expenditure planning

**Approach**
To support the development of CitiPower, Powercor and United Energy's Regulatory Reset Proposal for the 2026-2031 period, a forum with special interest group stakeholders (SIGs) was conducted to provide a direct input into shaping expenditure plans. Participants were asked to:

- Review existing scenarios,
- Share feedback on uncertainties under each,
- Ideate additional elements that may have been missed, and
- Prioritise which energy future is most likely.

**Participation**
A total of n = 26 stakeholders participated in the forum, which was held on Friday the 8th of December, 9am-1pm at Collins Square Business & Events Centre. A broad range of stakeholder groups were present and represented all three networks.

Stakeholder groups included:

- Council representatives
- Community established sustainability / energy groups / EV council / Greenhouse alliance etc.
- Business associations / representatives
- Vulnerable group advocates
- Emergency services (i.e., Fire Authority, SES)

Forums were attended by CitiPower, Powercor and United Energy senior executives and supporting team to listen and help answer questions of customers without biasing or leading the conversation. The following staff attended the Energy Transition summit:

1. Renate Vogt – General Manager, Regulation
2. Jeff Anderson - Head of Regulatory Strategy
3. Brent Cleeve - Head of Regulatory Policy and Compliance
4. Chris Gilbert – Regulatory Manager
5. Kaitlin Pisani – Project Coordinator

Additionally, this forum was attended by interested members of the Customer Advisory Panel (CAP), the Australian Energy Regulator (AER) and Consumer Challenge Panel (CCP) who were invited to attend the forum for the purposes of directly viewing and understanding the context of the conversations and the feedback received.

**Recruitment**

There were two main channels used to recruit participants:

1. An invitation was extended to engage individuals, including council members and community organisations. Recipients were encouraged to extend the invitation to other interested parties if they desired. As a result, participants were primarily composed of council representatives, established sustainability and energy groups, EV councils, Greenhouse Gas alliances, emergency services (such as the Fire Authority and SES), and other related business representatives.
2. Social media was also used to share the consultation details and provide access to a link to sign up for this consultation.

Consideration was given to recruit participants with a strong interest in future energy technology and solutions across the three networks.

**Compensation**
As a thank you for the time given, a charity donation was made on behalf of participants valued at $2,000 to the Asylum Seeker Resource Centre.

**Methodology**
Throughout this forum, three key topics were the focus of discussions:

1. Electric Vehicles and Charging Profiles
2. Battery Storage
3. Residential and Commercial Gas

Participants were grouped for discussions according to their network and background/area of expertise:

- CitiPower
- Powercor
- United Energy
- CitiPower, Powercor and First Nations

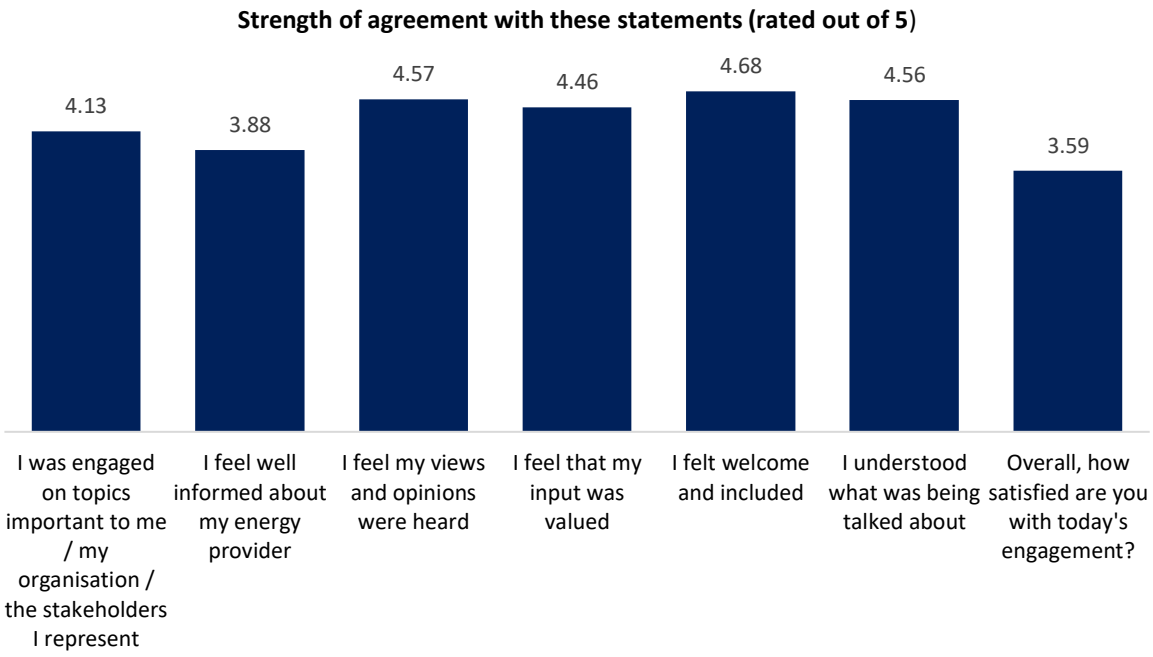
## IAP2 Spectrum

The level of customer participation in this program was intentional and is highlighted in our depiction of the IAP2 Spectrum shown below. This consultation falls within the 'involve' classification on the IAP2 Spectrum. SIG stakeholders were involved in shaping the direction of focus for the networks by discussing a wide range of issues, and then voting on the area they thought was most important.

IAP2 Spectrum of Public Participation[1]

| | Inform | Consult | Involve | Collaborate | Empower |
|---|---|---|---|---|---|
| **Public Participation Goal** | To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions. | To obtain public feedback on analysis, alternatives, and/or decisions. | To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered. | To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution. | To place final decision making in the hands of the public. |

## Evaluation




*Note: Results are based on small a total sample size of n=26. A minimum sample of n=30 is recommended for an indicative result.*

[1] IAP2, 2018, IAP2 Spectrum of Public Participation, accessed 22 November 2022, https://iap2.org.au/wp-content/uploads/2020/01/2018_IAP2_Spectrum.pdf

**Engagement Context**

During the consultation period, many events took place in Victoria impacting both the lives of customers and the broader electricity sector. We hypothesise these events impacted customers' needs and perceptions.

- Severe flooding and storms across Victoria from November 28, 2023.[2]
- Launch of the State Electricity Commission Strategic Plan 2023-2025.[3]
- Essential Services Commission Final Victoria Default Offer for 2023-2024 resulted in higher prices than 2022-2023.[4]
- Commonwealth Government delivery of $3B Bill Relief to eligible Australian Households.[5]
- Israeli-Palestinian conflict commenced in October 2023.[6]
- The first SEC battery project was forecasted to power 200,000 homes (November 2023).[7]
- United Nations Climate Change Conference (December 2023) saw nearly 200 countries agree to transition away from fossil fuels.[8]
- Rapid rises in electricity bills were predicted as Victoria transitions away from gas (December 2023).[9]

[2] Department of Home Affairs, 2023, Victorian Floods and Storms commencing 28 November 2023, accessed 16 January 2023, https://www.disasterassist.gov.au/Pages/disasters/current-disasters/Victoria/victorian-floods-and-storms-commencing-28-november-2023.aspx
[3] Premier of Victoria, 2023, The SEC Is Back: Accelerating Victoria's Renewable Future, accessed 16 January 2024, https://www.premier.vic.gov.au/sec-back-accelerating-victorias-renewable-future
[4] Essential Services Commission, 2023, Victorian Default Offer 2023-24, accessed 16 January 2024, https://www.esc.vic.gov.au
[5] DEECA, 2023, Help paying your bills, accessed 16 January 2023, https://www.energy.vic.gov.au/
[6] Council of Foreign Nations, Israeli-Palestinian Conflict, accessed 16 January 2024, https://www.cfr.org/global-conflict-tracker/conflict/israeli-palestinian-conflict
[7] The Age, 2023, The SEC's first project will be a battery big enough to power 200,000 homes, accessed 16 January 2024, https://www.theage.com.au/politics/victoria/the-sec-s-first-project-will-be-a-battery-big-enough-to-power-200-000-homes-20231129-p5enu3.html
[8] United Nations Climate Change, 2023, UN Climate Change Conference – United Arab Emirates, accessed 16 January 2023, https://unfccc.int/cop28
[9] The Age, 2023, Bills to soar as Victoria moves away from gas, accessed 16 January 2024, https://www.theage.com.au/politics/victoria/bills-to-soar-as-victoria-moves-away-from-gas-20231214-p5erjv.html

# Executive Summary

Throughout discussions with stakeholders, four key areas of concern emerged consistently:

- Affordability – discussed in the context of upfront investment for consumers, required for the adoption of new technologies.
- Functionality – the degree to which consumers feel new technologies have the potential to replace traditional infrastructure reliably.
- Demand management – the inevitability of heightened peaks placing more pressure on the grid and potential impacts on power quality.
- Government intervention – the need for government endorsement to incentivise stakeholders / consumers who currently have no reason to transition.

Outside of the above, other concerns were expressed in isolation to specific topics. For example, low comprehension and inequitable trading as it related to battery storage, as well as insufficient human labour as it related to electrification.

Above all topics discussed during the Future Energy Network Forum, affordability and government intervention were consistently raised as key areas for improvement. These were thought to go hand in hand, with a desire for government intervention to reduce the upfront investment associated with adopting new energy efficient technologies.

SIG stakeholders agreed that acquiring an EV, battery and switching from gas to electric, were all cost prohibitive activities. In the absence of government incentivisation, it was felt that only those living in higher socioeconomic areas would have access to new energy efficient technologies. This created equity concerns at both an individual and community level.

Beyond incentivisation, it was felt that the government could play a more active role in supporting the transition. Customers in electricity industry are generally characterised by 'low engagement'. Even those who exhibited higher engagement levels were expected to invest minimal time in comprehending the potential applications of new technologies. The expectation was that the introduction of a new policy mandating a gradual transition would be the most effective means of hastening adoption.

# Detailed findings across key topic areas

## Customer perspective on Electric Vehicle Uptake and Charging Profiles

Whilst EVs were considered economical due to rising fuel prices, SIG stakeholders regarded upfront investment an unresolved barrier to adoption, and therefore felt that government incentivisation for uptake was a key input into future demand.

In particular, council representatives of the CitiPower network commented that consumers did not have the capital (est. $40-50k) required to progress adoption. Current incentivisation initiatives, such as novated leases, were not considered adequate, calling for more government support. SIG stakeholders spoke to initiatives they had observed in other countries, with hope Australia may follow suit. For example, tax incentives in Europe such as Ireland, offering €5,000 relief for EVs costing up to €40,000.[10] In addition to tax breaks, one stakeholder made mention of BYD, a Chinese automotive company that released an EV with a retail price of ¥73,000, forecasted to be one of the top five car brands in the next five years.

[10] ACEA, 2023, Tax Benefits and Purchase Incentives, accessed 17 January 2024, https://www.acea.auto/files/Electric_cars-Tax_benefits__purchase_incentives_2023.pdf

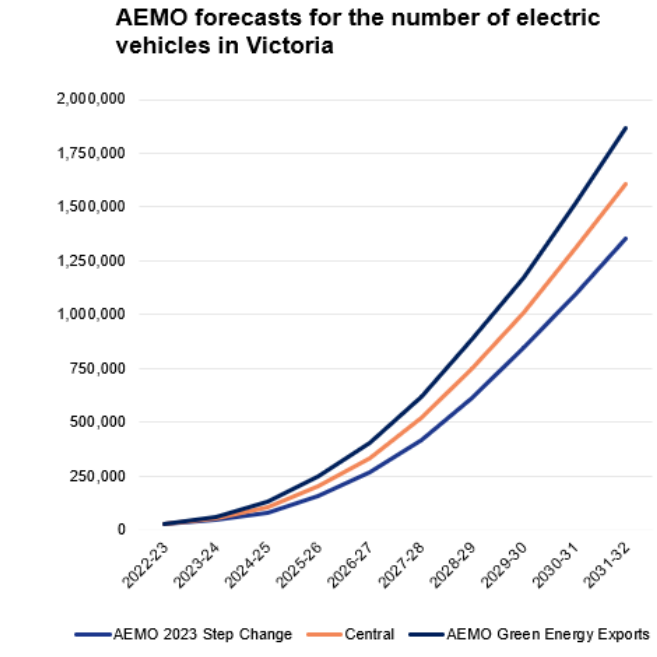
***"Most people [are] guessing 80 to 90%, would rather keep driving their current vehicle than switching to an EV. So, unless there is legislation that forces people to switch, or petrol goes through the roof. We are nowhere near that."*** (SIG Powercor Representative)

Beyond price, the use of EVs for certain jobs and / or activities were perceived a barrier to mass uptake, with a particular focus on those who require towing capacity.

Current EVs do not account for groups such as tradespeople or those who use light trucks outside of their employment. Tesla was mentioned as the only EV that had a 750kg towing capacity, which was deemed not suitable for tradespeople. Should this barrier be overcome through increased towing capacity of new EVs, it was still anticipated that the phasing out of traditional gasoline powered towing vehicles would be slow due to heavy investment in trucks during 2020. Due to the tax breaks provided at this time, it was unlikely those who capitalised on this opportunity would be ready to repurchase.

During the roundtable engagements, the information below was shown to SIG stakeholders, to gather their feedback in relation to different EV uptake scenarios (Exhibit 1).

**Exhibit 1: AEMO EV Uptake Forecast**




SIG Powercor stakeholders found it difficult to reach consensus on which of the above scenarios were most likely. One school of thought centred around social impetus – noting that we are yet to progress through the heavier stages of the adoption curve, with associated initiatives forecast to bring 'majority adoption' into full effect. It was expected that as more variability entered the EV market, at a more affordable price tag, desire would only grow. Community influence by way of conversations between neighbours, friends and family, was also anticipated to support uptake.

Generally, SIG stakeholders were hopeful – the majority of representatives, across all three networks, skewed toward the AEMO Green Energy Exports trendline. They did, however, grapple with their desire for strong uptake in contrast to what could be a harsh reality, some pointing to the slow uptake of solar with fear EV may follow suit. One stakeholder in particular suggested that when predicting the numbers of EVs, assumptions should be based on the success of the state government in achieving 50% new vehicle sales by 2030, implying ~12% of the light vehicle fleet transitioned by 2030; thus, this stakeholder suggested AEMO's forecast of 1.5 million was misguided[11].

The second school of thought discussed was more pragmatic, considering the functionality and logistics of progressing EV adoption.

<u>The functionality of EVs as it related to range and facilitating infrastructure (access to charging points) was a large factor causing hesitation to uptake.</u>

Range anxiety was expected to limit the uptake of EVs, particularly in areas where the footprint of charging stations was limited. SIG Powercor stakeholders commented that a more accurate view of uptake would be split by metro and rural areas, anticipating a marked difference, and weighted toward the former. Hydrogen cars (not included in the forecast) were considered a potential alternative where range was concerned, being easier to 're-fuel'.

Without incentive for landlords and developers to invest in charging infrastructure, uptake was forecast to be constrained. Apartment buildings also suffered from the added barrier that solar power was less common, meaning their ability to charge an EV at an affordable cost was inaccessible. An SIG United Energy stakeholder also mentioned that future plans regarding EV charging in apartment complexes would be constrained by automatic charging during off peak periods, that is, the inability to charge at an EV owner's discretion.

The future state of facilitating infrastructure, such as vehicle to grid (V2G) was also a point of contention. Whilst there was a consensus that this technology was far from fruition, it shed a light on what was currently missing with views that EV adoption may be delayed until technology has progressed. For example, California recently introduced a bill that requires all EVs to have bidirectional charging from 2027 to lower electricity costs and maximise reliability of the grid.[12] SIG CitiPower stakeholders contended that oil companies were endorsing this message, communicating that EVs should not be invested in until they become a 'battery on wheels' providing security during an outage and / or bill relief when electricity prices are high.

<u>Due to hesitations regarding uptake, it was anticipated the transition from fuel to electric would be phased and may conflict with council net-zero aspirations / objectives.</u>

Given hesitations regarding range anxiety and charging infrastructure, it was anticipated that within any given household, it is likely they will own one EV and keep one traditional gasoline powered car. Therefore, if complications present with the EV, the other vehicle will serve as a backup.

Whilst it was unclear whether the adoption of EVs would lead to an increased number of cars on the road, council representatives saw potential for this to occur and therefore, conflict with their objectives. Council representatives were currently working toward reducing road congestion through advocating green transport options, raising the price of parking and toll expenses.

[11] "There's about 4 million cars in Victoria, about 500,000 will probably be electric (BEV or PHEV) by the end of 2030. High-side estimates from AEMO's IASR that the number of EVs on Victorian roads in 2030 could credibly be 1.5 million are a fantasy- we'd love to see that, but it's not going to happen that quick" (SIG EV council representative).

[12] The Driven, 2023, Batteries on wheels: California to mandate bidirectional charging on EVS from 2027, accessed 17 January 2024, https://thedriven.io/2023/05/05/batteries-on-wheels-california-to-mandate-bidirectional-charging-on-evs-from-2027

Provided with the below stimulus, SIG stakeholders discussed expected charging behaviours (Exhibit 2).

**Exhibit 2: AEMO Charging Behaviour Forecast**

| AEMO customer EV charging behaviour | 2022-23 | 2030-31 |
|---|---|---|
| Step change convenience % | 66% | 56% |
| Step change night % | 21% | 27% |
| Step change day % | 14% | 18% |
| Central convenience % | 66% | 53% |
| Central night % | 21% | 30% |
| Central day % | 14% | 18% |
| Green energy exports convenience % | 66% | 50% |
| Green energy exports night % | 21% | 33% |
| Green energy exports day % | 13% | 17% |

Note AEMO also has highway charging, V2X and V2H forecast profiles – Highway charging profiles were removed and V2X / V2H profiles were incorporated into our daytime profile using weighted averages. AEMO forecasts 1% of residential vehicles charge with V2X and V2H in 2031.

SIG stakeholders discussed how the uptake of EVs may impact demand on the grid, identifying a need to advocate for EV adoption in a controlled manner.

SIG Powercor stakeholders expected charging behaviours would reflect current re-fuelling patterns, that is, re-fuelling based on either low price or convenience (for example, charging triggered by commutes to work). Collectively between SIG Powercor, United Energy, and CitiPower stakeholders, it was agreed that demand management was critical. There was a clear desire for distributers to direct and control usage as opposed to planning for all users to have complete convenience. For example, it was suggested that distributers may seek to replicate petrol station price signalling within the new charging environment. 'Trickle charging' was of particular concern and it was observed, there had been lower than expected uptake of the most evident solution – fast charging. As the early adoption phase of EVs was passing, it was anticipated that implementation of this infrastructure may be slow. Barriers to fast charging were identified in the connection point required and associated upfront investment. Additionally, stakeholders consistently emphasised the importance of utilising robust data sources when predicting the timing of EV charging. One stakeholder cited a study by C4NET as a credible source, that claims the impact per EV at peak time from home charging is ~250W/EV, across a sample of 3000 drivers[13]. This same stakeholder noted that "sharpened Time-of-Use (ToU) offers from retailers (such as Simply Energy and AGL's super-off-peak EV plans) will likely drive this down" (SIG EV Council representative).

Individual charging profiles were thought to be inherently linked to uptake, determined by access to charging infrastructure.

[13] C4NET, October 2023, Profiling Residential EV load Using Smart Meter Data, accessed 2 February 2023, https://www.bing.com/ck/a?!&&p=54eb937c7ea36c40JmltdHM9MTcwNjc0NTYwMCZpZ3VpZD0wZDQ3ZDg1Yi1lNjdmLTZmNzItMjk3MC1jYmQwZTc3MDZlYTUmaW5zaWQ9NTE4Nw&ptn=3&ver=2&hsh=3&fclid=0d47d85b-e67f-6f72-2970-cbd0e7706ea5&psq=c4net+Profiling+Residential+EV+Load+Using+Smart+Meter+Data&u=a1aHR0cHM6Ly93d3cuYWxsLWVuZXJneS5jb20uYXUvY29udGVudC9kYW0vc2l0ZWJ1aWxkZXIvcnhhdS9hbGwtZW5lcmd5LWF1c3RyYWxpYS9zcGVha2VyLXBkZi0yMDIyL3BwdC9TYW5heiUyMFRhYmFzaV9XZWQlMjAyNiUyME9jdF9SbSUyMDIxM18xMTIwLnBkZi5jb3JlZG93bmxvYWQuNjg0ODAwODIzLnBkZg&ntb=1.

Those with a garage were the most likely candidates for EV adoption given the space held to implement charging infrastructure. In the absence of a garage, the introduction of public charging infrastructure was suggested as a favourable solution. Mention was made of a trial in New South Wales, whereby the City of Sydney was working with AusGrid to better understand on-street EV charging needs and demand at suitable locations. It has also been designed with EV owners that do not have access to charging at home in mind.[14]

## Customer perspective on Battery Storage

In contrast to EVs, SIG stakeholders were less engaged in the topic of battery storage, which in some instances, attributed to lower comprehension of this technology.

There was a common misconception that batteries provided only two key benefits: saving money and combatting climate change. Whilst they believed that both were potentially true, SIG stakeholders contended there needed to be more education regarding reasons to adopt. The primary reason being the ability to improve reliability of electricity supply.

As it stood currently, batteries were still very much considered in an individual investment context with little purview over how this could be beneficial from a community perspective. Reference was made to a community battery implemented in Fitzroy North (the Yarra Community Battery Project) to test grounds for Melbourne's first inner urban community battery.[15] Whilst this was recognised as progress, it was argued that the benefits of this project could have been better socialised as an initiative to endorse ongoing adoption.

SIG United Energy stakeholders also raised the Australian Renewable Energy Agency (ARENA) Community Battery Funding Scheme, which sought to support the deployment of community batteries.[16] Once again regarded as a positive initiative, however, SIG stakeholders were not convinced that community batteries passed the economic 'sniff test' given their existence was only made possible through ARENA funding.

**Case Study: Protecting First Nations Assets**

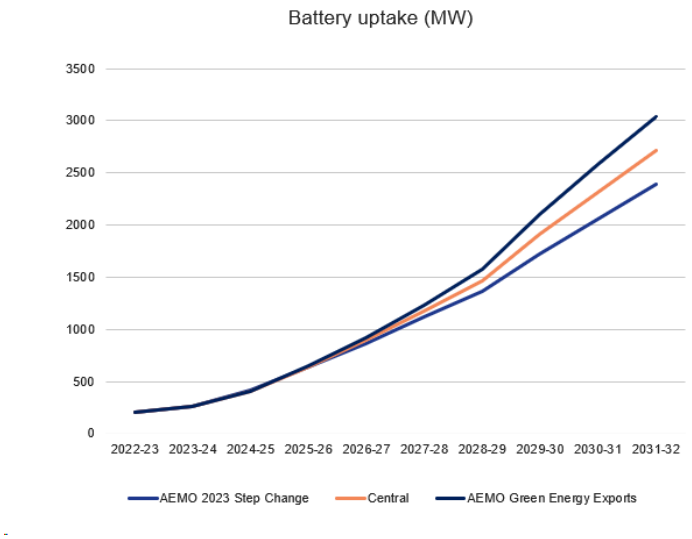
A First Nations representative expressed a desire to learn more about batteries as a tool to support their community. In particular, this representative wished they had known more about batteries when being offered land as part of the Native Title.

The First Nations people must ensure they are protecting culturally important assets. For example, should there be a bushfire, contingencies must be in place to prevent assets from being compromised. The First Nations representative specifically mentioned the Yorta Yorta cloak, an asset they sought to bring back to the community. It was considered that a community battery may strengthen the representative's argument to bring the Yorta Yorta cloak back to its keeping place, providing means of protection in the instance of a natural disaster and power interruptions.

[14] City of Sydney, 2023, On-street electric vehicle charger trial, accessed 17 January 2024, https://www.cityofsydney.nsw.gov.au/environmental-support-funding/on-street-electric-vehicle-charger-trial
[15] YEF, 2023, Yarra Community Battery Project, accessed 17 January 2024, https://www.yef.org.au/community-batteries/yarra-community-battery-trial/
[16] ARENA, 2023, Community Batteries Round 1, accessed 17 January 2024, https://arena.gov.au/funding/community-batteries-round-1/

The information below was shown to SIG stakeholders, to gather their feedback in relation to different battery uptake scenarios (Exhibit 3).

**Exhibit 3: AEMO Battery Uptake Forecast**




SIG United Energy stakeholders contended that investing in batteries and having access to battery storage lacked a compelling value proposition.

From a consumer perspective, the presumed benefits of battery storage were not compelling enough to encourage quick adoption. To take full advantage of the cost benefit equation, owners would require the ability to charge their batteries cost effectively. Therefore, it was forecasted that adoption of batteries would be led by solar users, a very limiting pre-requisite for adoption. SIG CitiPower stakeholders concurred, stating their pool of solar consumers made up approximately 10% of its network. As a result, SIG CitiPower stakeholders were more conservative in their prediction of battery uptake skewing to the AEMO Step Change / Central trendlines.

SIG stakeholders contended that non-solar users were typically less engaged in the energy category. It was felt that the average consumer was unlikely to spend time understanding this technology, the associated benefits and time required for organising installation.

***"People only spend an average of 12 minutes per year thinking about their energy usage."***
(SIG United Energy stakeholder)

SIG stakeholders argued that the average 12 minutes spent thinking about energy usage per year, was more likely attributed to paying household electricity bills, rather than adoption of battery storage. They also reflected on the likely advocacy of this technology through other parties. As there was no clarity over who should be responsible for implementing, owning and maintaining batteries, there was uncertainty regarding who advocacy should come from. For example, council representatives did not want to take responsibility for the maintenance of batteries as they viewed this as a financial liability. Whilst not necessarily an opinion held by the wider group, council representatives held strongly that networks should be responsible for maintenance, including the ongoing costs associated with this.

Ultimately, it was felt that until policy endorsing battery uptake was implemented, adoption would be limited. Out of desire, as opposed to the thinking behind what reality may present, SIG United Energy and Powercor stakeholders skewed toward the AEMO Green Energy Exports trendline. This desire was born out of the positive impact SIG stakeholders felt batteries could have on the environment. However, there was some scepticism over whether the benefits produced during the life of a battery outweighed the damage caused during its end-of-life discarding.

Beyond low engagement and a lacking value proposition, batteries were considered potential contributors to inequity.

SIG Powercor stakeholders raised the dangers of market fluctuation and consequential stock arbitrage. That is, battery owners may have the ability to buy large amounts of energy at an inexpensive price, store it and sell it at a more expensive price once demand has increased (for example, during an extreme weather event).

It was anticipated that those who could afford batteries were more likely to partake in trading behaviour, with fear this could become a common practice. SIG stakeholders wanted to understand how this type of activity would be regulated to protect the network from overvoltage. Having a third party / retailer manage consumers' batteries seemed unlikely, given this would present yet another barrier to adoption. It appeared that solving for smoothing demand and combatting the cost barrier to battery uptake were two obstacles at odds with each other.

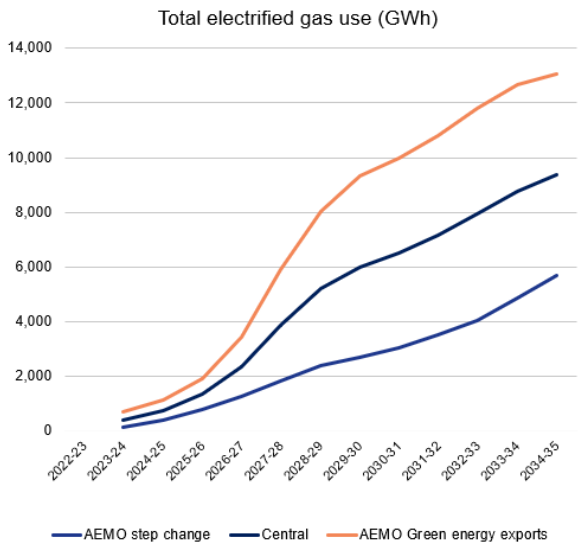
***"Dangers of batteries on the market is causing fluctuations just like the stock market where people are trading energy like crazy. This would create network issues with voltage all over the place, creating wild spikes up and down."*** (SIG Powercor stakeholder)

Inequity concerns also extended to the variability of socio-economic status between communities. For example, a SIG United Energy stakeholder referenced an instance in Western Australia, whereby a group of individuals invested in a community battery together. Whilst this had positive implications for those within that community, it was recognised that not all communities were in a position to afford this technology.

## Customer perspective on Residential and Commercial Gas

Provided with the below stimulus, SIG stakeholders discussed the most likely transition scenarios from gas to electricity (Exhibit 4).

**Exhibit 4: AEMO Electrification Forecast**




Upon initial inspection of the forecasts, it was raised that these did not consider the AEMO Draft 2024 Integrated System Plan. This document was released on the 15th of December post forum (held on the 8th) and outlines a roadmap for energy transition to reach a net zero economy by 2050.[17] With this in mind, trendlines were treated as subject to change.

When discussing the forecasts, some suggested these were too conservative to service demand post commencement of new policy in January 2024, let alone achieve the 2050 net zero goal.

***"10,000 gwh is 1/3 of residential gas load of 120pj/annuum. 10,000 gwh by 2031 is not fast enough to meet net zero by 2045."*** (SIG Powercor Stakeholder)

As of January 1st, 2024, new homes requiring a planning permit would reject gas connections, requiring all homes to be completely electric. In particular, SIG Powercor stakeholders felt the forecasts were too conservative to account for this ban, and therefore enable adequate distributor planning.

The broader majority of SIG stakeholders were unanimous in the sentiment that logistics of facilitating the 2050 target were not feasible.

SIG Powercor stakeholders commented that to achieve a net zero economy by 2050, approximately 1,000 connections would need to be converted per day. Assuming consumers were willing, there

[17] AEMO, Draft 2024 ISP Consultation, accessed 17 January 2024, https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations

would not be enough tradespeople / electricians to fuel this demand. Particularly in rural towns where there was a scarce number of electricians.

***"There are three plumbers across four postcodes."*** (SIG United Energy Stakeholder)

The equipment and raw materials needed to complete this work effort would also not be available. The new network equipment required in Australia was less than half a percentage point of global demand, indicating a low possibility that supply required for the transition would be fulfilled.

Hydrogen and bio-gas were discussed by SIG Powercor and United Energy stakeholders as two potential avenues to supplement electrification. However, the consensus was that each of these had their own barriers to adoption. Hydrogen could not be piped through the existing network which made it cost prohibitive, and it would be too difficult to produce enough bio-gas to meet the demand. Ultimately, it was decided the risk of stranded / redundant assets by exploring alternative options would be too large.

It was also acknowledged that the agenda of tradespeople would likely discourage electrification. For example, if someone experienced a problem with their gas cooktop, they would likely call a plumber to find a solution. It was regarded highly unlikely the plumber servicing this need would suggest changing the gas stove to an induction cooktop.

New builds were considered the path of least resistance, whereas existing homes were likely to prolong the electrification transition.

The impact of new vs. existing homes on transition from electricity to gas meant SIG stakeholders envisaged the forecast very differently depending on the distributer and / or region. Customers of the Powercor and United Energy networks were likely to transition quicker as these were key growth corridors for new dwellings. In particular, Powercor was referenced as the second fastest growing distributor network in Victoria. On the other hand, CitiPower was argued to have significantly less new developments with a need to retrofit electrification, renowned to be both an expensive and complex process. SIG CitiPower stakeholders note that with no incentive from the government, landlords would steer clear of this expense.

It was agreed across all networks that policy change had the greatest chance of accelerating electrification. SIG CitiPower stakeholders discussed whether it may be worthwhile to revisit the government installation scheme that did not gain much traction in the first instance. Outside of government subsidy, other initiatives discussed included incentivised reduced usage during peak times.

Half of those SIG United Energy stakeholders and the majority of SIG Powercor stakeholders skewed toward the AEMO Green Energy Exports trendline. The other half of SIG United Energy stakeholders skewed to AEMO Step Change / Central, and CitiPower to AEMO Step Change alone.

SIG stakeholders also expressed concern regarding the usability of electricity over gas, once the transition was complete.

SIG stakeholders were conscious of the impact electrification may have on stability of the grid. It was anticipated that peaks during extreme weather may be heightened, in particular, during Winter where heating has predominantly been powered by gas. Similarly, cooktops were a large topic of conversation where demand was concerned, given their use by all consumers within a similar time period. Gas stove replaced by induction cooktops were expected to place heavy demand on the grid during dinner time each day.

Similar to the adoption of other energy technologies, the main barrier to electrification was cost, followed closely by time.

Cooktops within existing homes were the largest point of contention when discussing cost as a key barrier to electrification. Replacing a gas stove with an induction cook top required rewiring of the fuse box to retrofit original provisioning. The investment required to do so was significant and may seem unwarranted to someone who could spend much less maintaining their current gas cooktop. SIG United Energy stakeholders were particularly concerned about those in low socioeconomic areas, anticipating they would not be able to afford transition costs.

In addition, it was recognised that the ongoing maintenance of an electric cooktop could prove a liability with extended wait times to organise an electrician call out. Whilst troubleshooting a gas cooktop could be resolved by a plumber within the same day, a consumer may wait a number of weeks to see an electrician. The quoting process also had potential to extend this, should consumers seek to find the best 'deal'.

***"If you had to get your hot water fixed, it could be organised for the end of the day. For electricity… it may take up to a week."*** (SIG Powercor stakeholder)

SIG stakeholders also discussed the impacts of electrification on industrial organisations, expressing concern regarding those who have made considerable investment in gas.

Industrial organisations accounted for approximately 30% of gas usage. Furthermore, it was noted that boilers (owned by many industrial organisations) needed to heat at a high temperature, one that electricity could not facilitate. Due to these requirements, industrial organisations had made significant investment in gas which led SIG stakeholders to question how these companies would be compensated for the transition.

The reshoring of industrial organisations was also raised as a factor that may impact demand. A number of smaller organisations were forecasted to bring business operations back to Australia, increase usage of electricity, demanding more of the grid.

### Resources:

Throughout the course of the engagement, SIG stakeholders were asked to provide supporting resources as they discussed the three topics. The resources suggested by stakeholders included:

- The Driven, EV News Site
- Carloops, Online Data Aggregator
- Australian Electric Vehicle Association, NFP supporting the transition to EVs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