Why households adopt batteries and why many aren't joining a VPP

Virtual Power Plants (VPPs) are expected to play a central role in lowering electricity system costs for all consumers by providing valuable system services and enabling greater coordination of consumer energy resources. However, despite a household battery storage boom, VPP uptake has been limited, prompting some industry stakeholders to question whether VPPs can be scaled successfully, or whether alternative approaches are needed.[1]

Several hurdles need to be overcome for VPPs to achieve their potential. Households with solar and batteries must decide to join a VPP – allowing a third party to exert some level of control over their battery or other energy devices. For significant uptake, VPP providers need to reduce or avoid any risks consumers face by participating, and maintain a simple consumer experience. Enabling VPPs to achieve their full potential also requires batteries within VPPs to be operated in ways that reduce system costs; reducing system costs depends on prices and market settings accurately reflecting costs and benefits.

This report draws on Energy Consumers Australia's June 2026 Consumer Energy Report Card survey to explore the factors that are currently holding consumers back from participating in VPPs. We find that:

- Households purchase batteries primarily to reduce electricity bills, with increasing energy independence, and securing backup power during outages as the next most important motivations.
- Limited awareness, concerns about losing control of household batteries, low trust in providers, and limited opportunities remain significant barriers to VPP participation.
- Low consumer literacy and low engagement can constrain VPP uptake and increase the risk of consumer harm for those who do participate, highlighting the need for stronger consumer protections.
- Current pricing arrangements at the retail and network level incentivise batteries to be used for self-consumption. These pricing arrangements are a barrier to VPP adoption and limit the broader system benefits that coordinated battery operation can provide.

If presented with the choice, most battery users will prioritise maximising their cost savings as opposed to maximising self-sufficiency. This suggests that with the right business models, pricing structures and protections, consumers will consider and choose to participate in VPPs. From our findings, we recommend that:

1. Energy Ministers adopt a consumer duty to ensure VPP customers, are protected from harm and receive fair outcomes.
2. The Australian Energy Market Commission (AEMC) implements pricing reforms to require distribution networks to provide cost-reflective network tariffs for retailers and aggregators.
3. State governments work with networks to target installing distributed batteries where they are needed most.
4. The Australian Energy Market Operator (AEMO) monitors how VPPs are being operated in practice to ensure system benefits are delivered.

5. Governments – potentially through the Australian Energy Regulator (AER) – ensure households receive a fair share of the value generated through VPP participation.

Getting this right can help accelerate Australia's transition to renewable energy and lower costs for all consumers.

The value of VPPs to the system is expected to be significant

The term VPP is not consistently defined or understood across the sector. For the purposes of this report, we have defined a VPP as a network of Consumer Energy Resources (CER) – such as batteries and solar systems – coordinated and controlled by an energy retailer or VPP provider to operate as a single, dispatchable resource.

Aggregating and managing batteries through a VPP can support grid stability, reduce peak demand, and provide other system services. This can reduce or avoid the need for investment in additional generation and network infrastructure, decreasing the overall cost of the energy system, and saving money for all consumers. In return for participating, households typically receive financial incentives, such as bill credits or higher feed-in tariffs.[2]

AEMO forecasts an increasing role of coordinated batteries through VPPs. By 2050, AEMO's Integrated System Plan (ISP) Step Change scenario expects that more than 50% of batteries will be orchestrated through a VPP.[3]

The system-wide benefits of coordinated consumer energy resources are expected to be significant. Modelling commissioned by the AEMC finds that the coordinated use of consumer energy resources could deliver around $45 billion in system benefits shared by all consumers, with most of these benefits coming from wholesale market cost savings.[4]

VPPs optimise when household batteries import and export power, responding to real-time market conditions. For instance, there are infrequent times when wholesale spot prices exceed $5,000/MWh. While these events are rare (less than 0.5%), they can have a material impact on average wholesale spot prices and contracting costs. For example, the AER's Q1 2024 wholesale markets quarterly report found that just 11 instances of wholesale spot prices above $5,000/MWh in Queensland contributed to an over 30% increase to the quarterly average price.[5]

VPPs help mitigate these shocks by optimising battery exports to provide lower-cost, clean electricity supply when the system is stressed. This reduces the instances where wholesale spot prices are high, reducing wholesale costs for all customers. In short, VPPs don't just support the consumers participating in them, but all consumers, by taking pressure off the grid at critical times.

VPP participation is not keeping pace with battery uptake

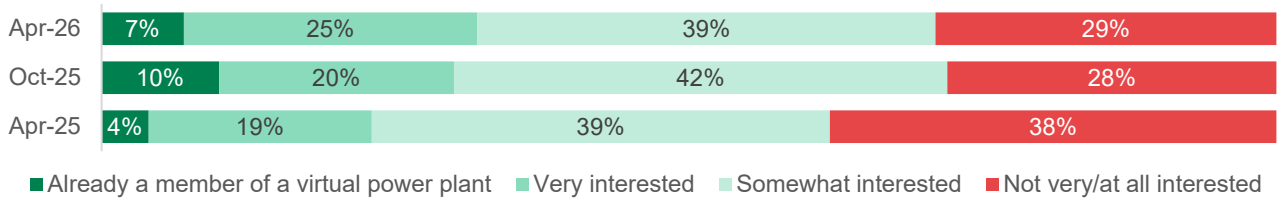
In our survey, we provided households with a high-level explanation of what a VPP is, before asking them about their interest in joining one.[a] As shown in Figure 1, reported VPP participation among current battery owners has remained low across all three survey waves, ranging from 4% to 10%.[b] Despite the

[a] This is the explanation we included in survey before asking interest level for joining a VPP: A virtual power plant connects homes with solar panels and batteries to work together like a big power station. By joining, your battery can charge and discharge at the best times to support the needs of the energy grid, and in return you get paid or receive discounts on your energy bills.

[b] We note that these participation rates are lower than the ACCC's estimate of around 24% VPP participation across the National Electricity Market (NEM). This difference may partly reflect differences in timing and methodology. The ACCC estimate is based on market data from late

fast growth in battery uptake, most battery-owning households are not currently participating in a VPP. However, many (64%) express some level of interest.

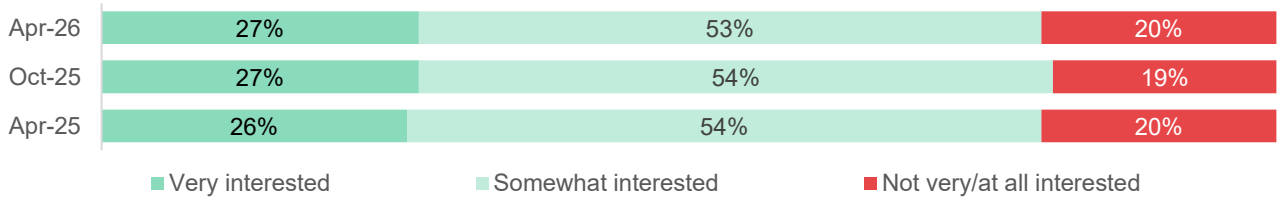
Figure 1: Interest in VPP for those who currently own a battery



Base: Respondents who currently own a battery. Apr-25 (n=232), Oct-25 (n=313), Apr-26 (n=455).

Willingness to join a VPP is somewhat higher among households researching or considering a battery. Around one in four say they are very interested, with overall willingness exceeding that of existing battery owners. This may reflect different expectations about the benefits and trade-offs of participation prior to battery ownership. Once households have purchased and started using a battery, they may become more cautious about sharing control of it, or simply feel they are already achieving financial benefits without joining a VPP, reducing the perceived additional value.

Figure 2: Interest in VPP for those researching or considering owning a battery



Combined, these findings suggest that VPP uptake is unlikely to meet AEMO's assumed adoption rates. This is also highlighted by the Australian Competition and Consumer Commission (ACCC), whose own estimates show virtual power plant participation is falling further behind battery uptake.[6] This gap is a potential barrier to batteries realising their full potential to reduce system costs.

However, AEMO's projections assume much smaller average battery sizes – around 10 kWh today and 20 kWh by 2050. Given the current surge in household battery capacities, with many new systems already exceeding these assumptions, similar levels of orchestrated capacity could be achieved with lower participation rates. Moreover, total installed battery capacity has already far exceeded ISP predictions. AEMO's Draft 2026 ISP assumes around 1.5 GWh of batteries installed by June 2026, yet over 10 GWh have already been installed.

2025, whereas our survey data were collected around four months later, in April 2026. In addition, the ACCC estimate is derived from administrative market data, while our estimate is based on self-reported survey responses from a nationally representative sample of households.

VPP participation is highest in South Australia, Western Australia and New South Wales

Based on our survey, at the state level, South Australia has the highest share of VPP participation, with 15% of household batteries enrolled. This is followed by 12% in Western Australia and 10% in New South Wales.

South Australia's strong uptake is likely influenced by the state government's support for the Tesla-led Virtual Power Plant initiative, launched in 2018, which installed more than 6,500 solar- and battery- systems in public housing.[7,8] In addition, under the South Australian Retailer Energy Productivity Scheme (REPS), households can receive rebates of up to $2,000 for connecting their home batteries to an approved Virtual Power Plant, further boosting participation.[9]

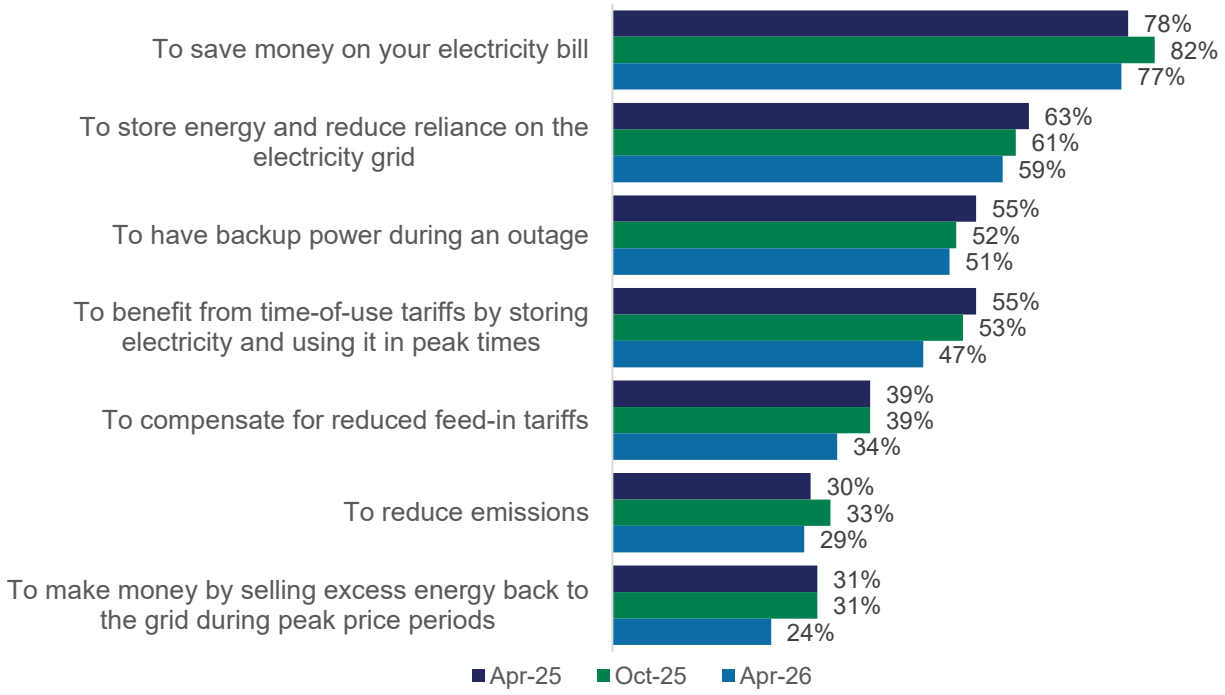
Higher uptake in NSW and WA may also reflect the availability of VPP-linked incentives in these states. In both jurisdictions, households can access additional savings on top of the Cheaper Home Batteries Program by joining a VPP.[10]

Households adopt batteries mostly for cost savings, reducing reliance on the grid, and backup power

By understanding the underlying motivations for Australians purchasing a battery, it is clear why some may be hesitant to join a VPP. As shown in Figure 3, saving money on electricity bills is the leading motivation for adopting a battery. However, the next two most important motivations are storing energy to reduce reliance on the grid (around 60%), and having backup power during outages (more than 50%).

These findings suggest that households value batteries not only for the savings they provide, but also for the greater energy independence and resilience they offer. For some consumers, there may be concerns that participating in a VPP could reduce these benefits if stored energy is dispatched to support the grid, leaving them to purchase electricity later, or reducing the energy available during a power outage. This may contribute to a preference for retaining full control over how and when their battery is used.

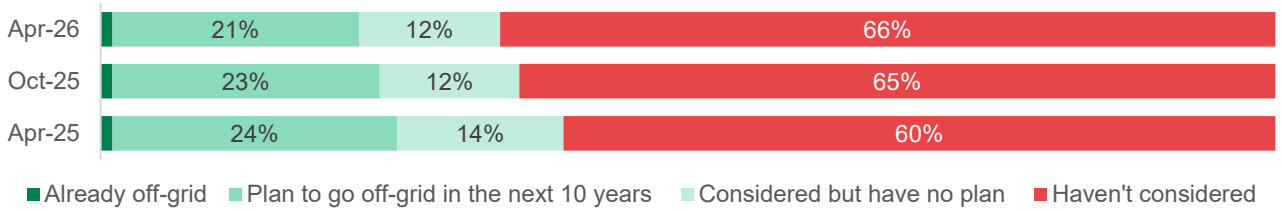
Figure 3: Motivations for battery adoption among those who currently own a battery or are interested in one



Further, as shown in Figure 4, among households that currently own a battery, or are researching or considering one, around one in five report that they have already disconnected from the grid or plan to do so within the next ten years, compared with around one in ten households overall. These households are more likely to have experienced unreliable network supply, to express concerns about ongoing network reliability, and to live in regional areas.

We highlight these findings not to suggest that this interest is likely to result in material action. Rather, it reinforces the underlying motivations and attitudes of households with batteries and shows that for at least some of this cohort, the desire for energy independence extends as far as wanting to disconnect from the grid entirely.

Figure 4: Consideration of going off-grid among those who currently own a battery or are interested in one



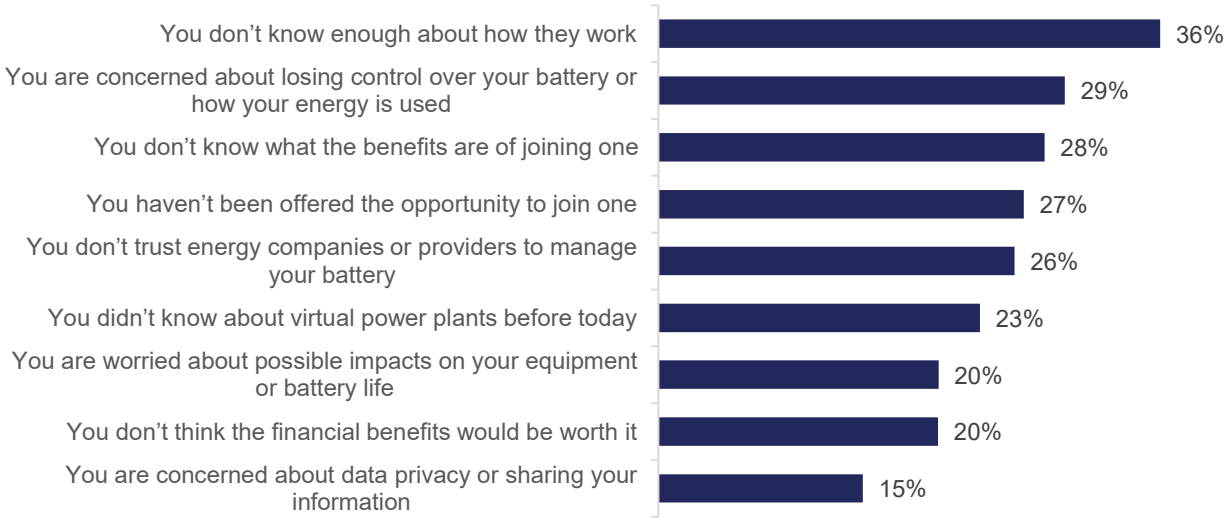
Households identify several barriers to VPP adoption

Figure 5 presents the main reasons households with a battery choose not to join a VPP. The most commonly reported barrier is a lack of understanding of how VPPs work, with 36% of respondents identifying this as a reason for not participating. Around one in four also report not knowing what the benefits of joining a VPP are (28%) or being unaware of VPPs before completing the survey (23%). Together, these findings suggest limited awareness and understanding about VPPs, even among households that already have the technology needed to participate.

Concerns about control and trust are also prominent. Nearly three in ten respondents (29%) are worried about losing control over their battery or how their stored energy is used, while 26% say they do not trust energy companies or providers to manage their battery. These concerns are consistent with earlier findings that households value batteries not only for bill savings, but also for the energy independence and resilience they provide.

Access to VPPs remains a barrier for some households. More than one in four respondents (27%) report that they have not been offered the opportunity to join a VPP. This likely reflects a mix of factors. For some households, a VPP may not be available or actively promoted, while others may simply be unaware that participation is an option. This suggests that participation is constrained not only by consumer preferences, but also by the availability, visibility and promotion of VPP products. ACCC analysis found that compatibility between battery brands and VPPs varies considerably due to limited interoperability.[c] Of the 16 most popular battery brands installed under the Cheaper Home Batteries Program, some were compatible with only a handful of VPPs, while others were not compatible with any of the sampled products. This suggests that, for some households, the inability to join a VPP reflects a structural market barrier rather than a lack of interest.[11]

Figure 5: Why battery owners say they have not joined a VPP

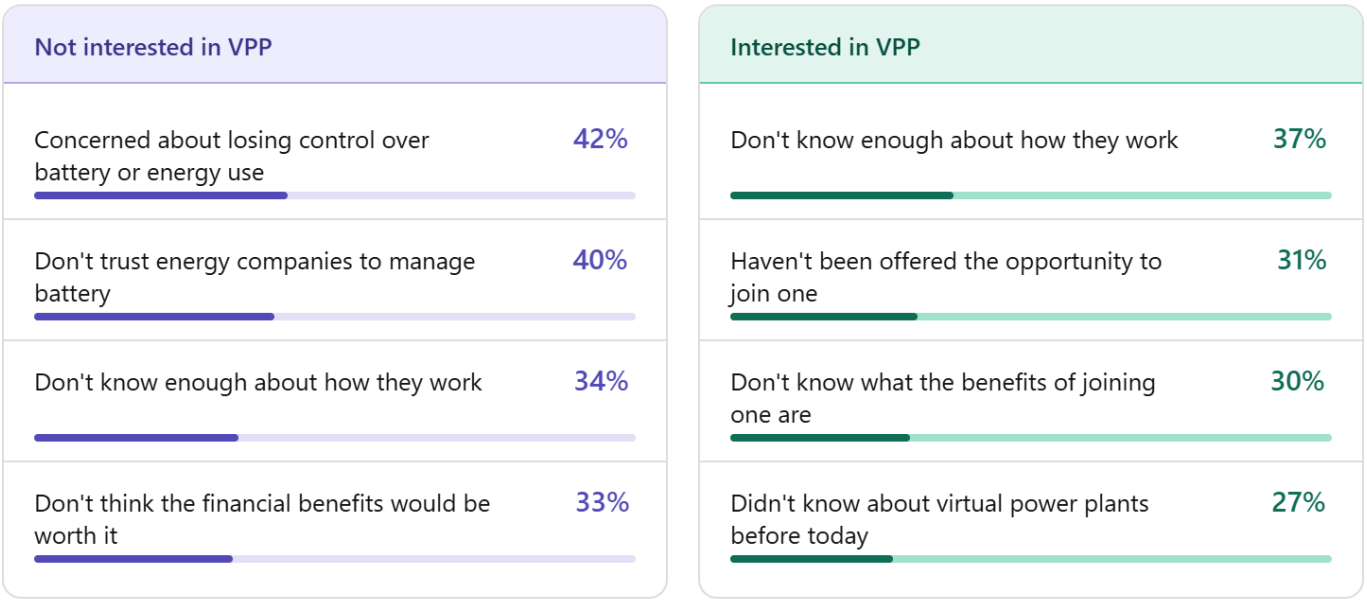


Base: Respondents who currently own a battery but have not joined a VPP (n=420)

[c] Interoperability is the ability of batteries and VPP platforms to communicate and work together. Limited common technical standards mean VPP providers often support only selected battery brands and models, limiting participation for some households.

Interestingly, the barriers differ between households that are not interested in joining a VPP and those that are interested. Among households not interested in participating, the main concerns relate to losing control over their battery or energy use (42%), distrust of energy companies managing their battery (40%), and uncertainty about how VPPs work (34%). Concerns about whether the financial benefits would outweigh the costs were also common (33%).

Figure 6: Reasons for not joining a VPP among households with a battery, by interest level



By contrast, households that are very, or somewhat interested, in joining a VPP are primarily held back by a lack of information and opportunity. The most common barrier for this group is not knowing enough about how VPPs work (37%), followed by not having been offered the opportunity to join one (31%) and uncertainty about the benefits of participation (30%). Notably, 27% had not heard of virtual power plants before the survey, highlighting a substantial awareness gap. Together, these findings suggest that while desire for control and trust are key barriers for uninterested households, information, awareness, and access are the main barriers for households already open to participating.

Households with batteries tend to have higher levels of energy knowledge, but many still have energy knowledge gaps and prefer simplicity

As we've highlighted in previous work, capability can be a barrier to adopting energy products: if consumers find a product confusing, they may simply opt out. The complexity of how VPPs operate – along with uncertainty about who gets the benefits – can make decisions about whether to join a VPP challenging for consumers. This is especially the case given the considerable variation between VPP offers and the outcomes consumers can experience, which can make it difficult to know whether a given product is likely to suit their circumstances.[12]

We find that battery adopters tend to have higher energy knowledge than other households. However, assuming this is the case for all adopters is risky. Table 1 shows that fewer than half (43%) of battery owners know what a feed-in tariff is and know their battery capacity.

Some of these gaps may stem from the fact that many owners did not choose the system themselves. For instance, around 20% of households with solar or batteries moved into a home where the system was already installed. This lack of involvement can limit their understanding of how the system works or what features it includes.

This matters directly for VPP participation. For households with limited energy literacy, or who inherited a system they don't fully understand, these decisions may feel too complex or risky. This increases the likelihood that they will either:

- avoid joining a VPP altogether, or
- join a VPP that doesn't align with their needs, expectations, or consumption patterns.

Preferences for simplicity further reinforce this dynamic. Over 40% of households with a battery, or interested in one, report preferring a "basic" relationship with the energy system – prioritising a good price and service over an "active" relationship – managing imports and exports, and monitoring energy use. This highlights the diversity of consumer preferences and suggests that many households may not be motivated to join a VPP if participation involves or is perceived to involve complexity or uncertain savings.

Table 1: Energy knowledge of households with a battery

Group	Share
Definitely know both (what their feed-in tariff & battery capacity is)	43%
Definitely know one but not the other	40%
Don't know or not sure about either	17%

Current pricing arrangements can encourage self-consumption

Under current pricing structures, the primary financial benefit of a battery for a household is not what it *earns*, but what it *saves* through avoided grid consumption.

The two most common retail electricity pricing structures are flat rate or time-of-use (TOU) plans. Of the approximately 67% of households who say they know what their retail pricing structure is, 46% say they have a flat rate plan, and 50% say they are on a TOU plan. Of those with a battery (and who say they know their retail plan), TOU plans are slightly more common, with around 55% on one.

For a household with solar, a battery can save them money by being programmed to store excess generation and use it at peak times. As discussed above, VPPs provide an additional opportunity for households to earn rewards by exporting electricity or allowing a retailer or aggregator to optimise the operation of their battery. Figure 7 illustrates this by using ACCC data to estimate the savings households with solar can receive by using a battery for self-consumption or for VPP participation. It does so by comparing bill components for the median household with solar only against bill components for the median household with solar and a battery or the median household with solar and a battery enrolled in a VPP. Figure 7 shows that:

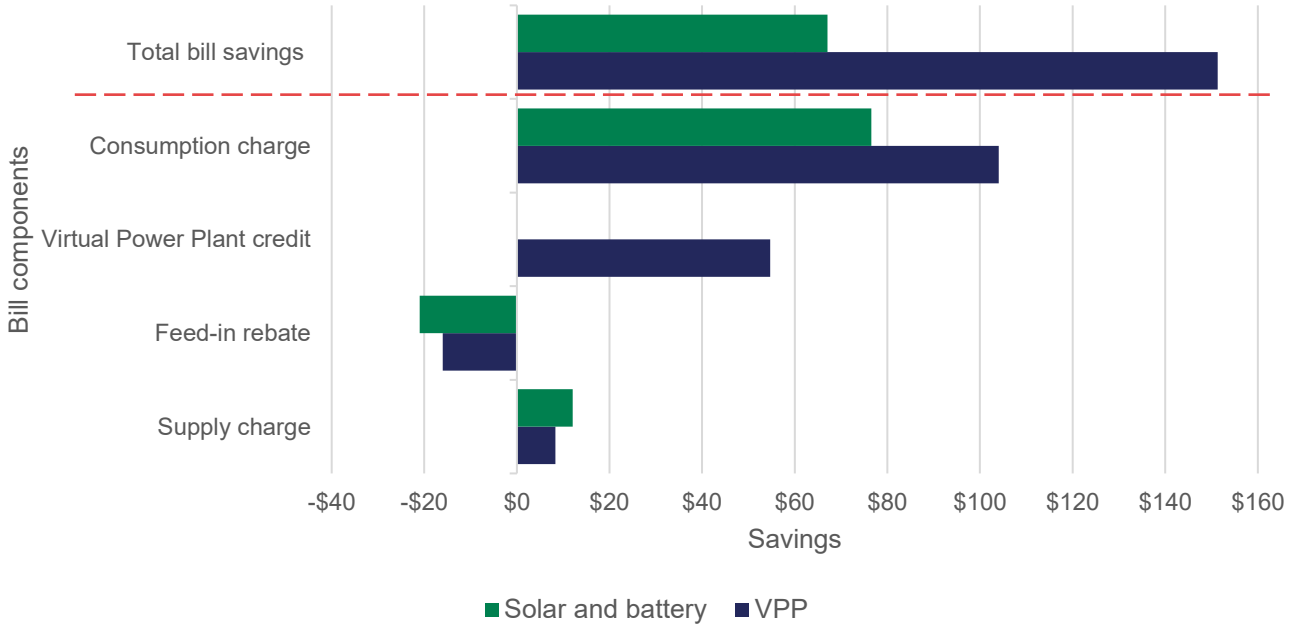
- Customers enrolled in a VPP saved more on their energy bills than households just using their battery for self-consumption.

- The dominant driver of bill savings for both VPP and non-VPP households is avoided grid consumption charges. For example, over 60% of the estimated savings a household in a VPP receives is from avoided consumption charges.
- VPP households receive additional VPP credits,[d] with a median value of around $55 per quarter. Despite often receiving the highest feed-in tariffs, VPP participants earn less in feed-in credits than solar-only households, likely due to their higher levels of self-consumption. Non-VPP battery households earn less in feed-in credits than both solar-only and VPP households.

Combined, this suggests that for some households, batteries are economic as they allow households to maximise solar self-consumption, rather than relying on additional value from VPP participation. These benefits are likely to be higher for customers on TOU plans, where batteries can be programmed to store solar during the day and discharge during peak periods to avoid higher consumption charges.

TOU plans are relatively predictable and easy for battery households to optimise for, making them an effective way to reduce electricity bills. However, because they provide strong and reliable savings from avoided peak prices, they may also reduce the incremental benefit of participating in a VPP, acting as a behavioural barrier to uptake.

Figure 7: Estimated quarterly bill savings for battery and VPP households relative to solar-only households (Q3, 2024)



Note: ECA analysis using ACCC data, Inquiry into the National Electricity Market Report – July 2025.

Retail tariffs shape battery behaviour — and can conflict with system needs and benefits

[d] VPP credit is the total amount for any credit applied to the bill for participation in the retailer's Virtual Power Plant.

How batteries operate – and therefore how they influence system costs – depends on the price signals they receive. In practice, household batteries used primarily for self-consumption are typically exposed to three signals: their retail tariff, whether their solar system is generating, and household electricity consumption. While these batteries can provide important system benefits, such as reducing evening peak demand, they are not always optimised to minimise overall energy system costs or respond to real-time system needs.

Retail tariffs bundle a range of system costs including network charges (around 33-48% of costs), wholesale costs (around 31-45% of costs), and environmental, retail and other costs.[13] Network costs – which cover building, operating and maintaining electricity networks, as well as providing a regulated return on capital investment – typically make up the largest share of household electricity bills. These costs are then recovered through retail tariff structures that typically combine a relatively small fixed daily charge with a larger consumption-based charge, either as a flat-rate tariff or a time-of-use tariff, where electricity consumed during peak periods attracts a higher price.

While retail tariffs are designed to recover costs and provide relatively simple price signals for consumers, they do not necessarily reflect the times and locations where battery operation delivers the greatest value to the electricity system. As a result, battery operation that minimises a household's electricity bill – for example, by reducing grid consumption during peak-price periods – may not minimise overall system costs or deliver the greatest benefit to the broader electricity system. We explain this further below.

Network capacity constraints are highly conditional

Networks are gradually transitioning their tariff structures for households from flat structures to predominantly TOU structures.[14] For example, Ausgrid's flat network tariff, which is closed to new customers, has a 13 cent per kilowatt-hour anytime consumption charge. Ausgrid offers a TOU tariff with a peak charge of 33 cents per kilowatt-hour, applied between 3:00 pm and 9:00 pm each day during the periods of June to August, and November to March.[15] These tariffs are intended to reflect that network costs can rise if household peak demand rises.

Consumer-owned assets like household batteries can reduce the need to build out network capacity by reducing peak demand. However, the extent to which household batteries can reduce electricity network costs in the short- to medium-term depends on several factors.

- First, network infrastructure must be facing capacity constraints. The AER has found that distribution network utilisation (a measure of how "full" networks are at peak times) remains low for many networks, even at the maximum demand event in the year.[16]
- Second, household batteries will need to be installed near the locations where network infrastructure is becoming constrained.
- Third, batteries must actively reduce demand on the specific days and times when local peak stress occurs.[9] As the AER explains, outside instances where demand is close to the maximum demand event (99% of the time), network utilisation is considerably low.

Positively, recent analysis by AEMO found that on 27 January 2026 (when a new peak demand record was broken in Victoria) households with solar and batteries had a lower peak demand than households just with solar. This illustrates the system benefits to all consumers from household batteries.

The evolving profile of wholesale market volatility

Most of the time, wholesale spot prices (which are set every 5-minutes) are relatively moderate. For example, in NSW from 1 December 2025 to 30 April 2026, wholesale spot prices were below $150/MWh (or $0.15/kWh) in 98% of the 5-minute trading intervals. In South Australia over the same period, wholesale spot prices were below $0.15/kWh for 92% of trading intervals.

As discussed above, there are infrequent but costly occasions when wholesale spot prices exceed $5,000 / MWh. Many would expect that high price events occur only during traditional peak demand periods (late afternoon and early evening). However, Table 2 shows that high price events can occur in the morning, during the day or overnight, though overall, they are concentrated in 'traditional' peak demand periods.

Table 2: Time of high-price wholesale events FY23-25

	New South Wales	Queensland	South Australia	Tasmania	Victoria
4am to 10am	9.8%	5.5%	26.3%	32.1%	12.4%
10am to 4pm	9.5%	4.6%	6.6%	24.8%	15.7%
4pm to 10pm	80.7%	89.3%	61.8%	42.3%	71.9%
10pm to 4am	0.0%	0.7%	5.3%	0.7%	0.0%

Source: ECA Analysis of AEMO Wholesale Market Data.

This distribution demonstrates that substantial system benefits can be unlocked via demand reduction or consumers exporting at a wide range of times during the day. This is because high price events can also be driven by weather anomalies and other factors such as transmission network constraints or coal outages.[17]

As an example, on 25 November 2025 just after midday, NSW wholesale spot prices reached the wholesale market price cap at $20,300/MWh. Analysis of this event found that a contributing factor was a rapid drop in rooftop solar generation as a large cloud covered the Sydney metropolitan area.[18]

Current pricing structures limit the value households can receive from VPPs

As discussed above, VPPs can enable customers to earn rewards for exporting energy or allowing their retailer or aggregator to control the operation of their battery. In this way, batteries become more responsive to wholesale market prices and network conditions, enabling them to respond more effectively during periods of peak system demand.

Imagine that a VPP operator responds to a forecast high-price event and fully dispatches a household battery to support the grid in the middle of the day. From a system-perspective, this is exactly the outcome needed – providing low-cost supply to the market when and where it is most valuable.

However, if that household is on a time-of-use tariff, they may face higher consumption costs later in the day. When the household moves into its normal evening routine, the battery may no longer have stored energy available. The customer is then forced to draw electricity from the grid during the retailer's designated peak pricing period, exposing them to high peak consumption charge.

As a real-world example, the ABC reported that a consumer who enrolled in AGL's VPP scheme was frustrated after their retailer, remotely discharged their battery to 5% reserve level.[19] This customer was later hit with a demand charge. From a system perspective, AGL was doing the right thing – providing low-cost clean power to the wholesale system when it was most needed. However, because that customer was on a demand tariff, they were hit with a high cost in that period.

While we cannot say definitively the overall value proposition this consumer received from VPP participation, this example illustrates the trade-offs that can arise under some VPP models. The financial benefits households receive from a VPP depend on the structure of the program, how market revenues are shared, and the extent to which participation changes battery operation. In some cases, the additional earnings acquired through VPP participation may be partly offset by increased grid purchases at other times. The extent of this effect will depend on the retail tariff, wholesale market conditions, and the VPP's dispatch strategy. In addition, VPP revenues can be less predictable than bill savings from self-consumption because they depend on changing market conditions and dispatch events.

By contrast, the savings associated with self-consumption are generally more predictable, and the value proposition is simpler and easier for households to understand. Customers can reduce bills by avoiding grid consumption during designated peak tariff periods. However, these tariff structures can sometimes overstate the system value of battery behaviour by rewarding responses to fixed retail peak periods that do not always align with actual network or broader system needs.

Modelling done by Energeia, commissioned by the AEMC, also highlights this misalignment. Coordinated use of consumer energy resources could deliver around $45 billion in system-wide benefits by 2050, yet modelling found that consumers who provide this value would currently be significantly negatively impacted on their electricity bills due to misalignment between actual system costs and retail tariffs. This conflict between system optimisation and individual bill outcomes can lead to suboptimal VPP operation. In practice, VPPs may only be dispatched during a limited number of high-value events because operating batteries more frequently can impose additional costs on participating households.[20]

Ultimately, while common time-of-use tariffs are relatively easy for consumers to understand and can support initial battery adoption, they can also unintentionally discourage VPP participation and reduce the total system benefit of every battery installed in the system. By financially penalising consumers when their batteries are used to respond to periods of genuine system need, current pricing frameworks can undermine more efficient coordination of CER across the electricity system and reduce the overall efficiency of the energy transition.

It's not all doom and gloom for VPPs

When forced to choose between maximising self-sufficiency and maximising cost savings, three quarters (75%) of households choose cost savings. This finding suggests that although energy independence is important to many consumers, reliable and measurable bill savings remain the primary driver of household energy choices. VPP offerings that clearly and consistently deliver financial benefits may therefore resonate with a substantial share of battery owners.

The ACCC has found that customers participating in a VPP generally have lower bills than households using their battery simply for self-consumption (see Figure 7). This suggests that VPPs may indeed be aligned with the main underlying motivations for many households – saving money on electricity bills. However, this value proposition will need to be clear and trusted.

As highlighted earlier, key barriers to VPP uptake include limited understanding of what VPPs are and how they work, concerns about losing control over household batteries, and uncertainty about the benefits of participation. However, among households already interested in participating, the main barriers are lack of information, awareness, and opportunity — suggesting there is considerable scope to increase participation through clearer communication and more transparent offers.

Recommendations

Our results suggest several focuses for industry and governments to ensure the uptake of VPPs by households who choose to benefit all consumers.

Energy Ministers adopt a consumer duty to ensure VPP customers are protected from harm and receive fair outcomes.

We have shown that households with a battery do not necessarily have high energy literacy. Given VPP products require households to give a third-party control over their battery, this exposes them to increased risk, such as financial risk and enhanced battery degradation due to overuse. Our research also shows that concerns about losing control of household batteries and low trust in energy providers are among the most common barriers to VPP participation. A consumer duty is needed to ensure retailers and aggregators are required to act in consumers' best interests when operating consumers' energy devices.

The ACCC has also recently recommended introducing an overarching consumer duty, noting that it would better protect consumers and give them greater confidence to participate in VPPs by ensuring VPP operators act in customers' best interests. This is particularly important while interoperability limitations restrict the number of VPP options available to many households, limiting consumers' ability to switch providers.[21]

For more information on a consumer duty, see here.

The AEMC implements pricing reforms to require distribution networks to provide cost-reflective network tariffs for retailers and aggregators.

Current network pricing methods, such as TOU tariffs, are one factor driving household battery uptake. However, these tariffs often provide an imperfect signal of underlying network costs. In many periods, they can over-reward battery operations that have little impact on network costs, while under-rewarding battery use during the relatively small number of critical peak events that drive network investment. As a result, batteries may be operated in ways that maximise tariff benefits rather than deliver the greatest reduction in network costs.

One way to better align battery incentives with underlying network costs is through the design of two-way network tariffs. Many networks in Australia are introducing such tariffs which include charges and rewards for both electricity imports and exports. But few if any of these tariffs are set so that the charge they place on consumers for importing electricity matches the reward they provide consumers for exporting. (By contrast, traditional one-way tariffs, which remain much more common, provide no reward for exports.). In principle, if a network faces a cost from increased consumption, it would receive a similar benefit from increased export onto the network. Introducing symmetric tariffs can better align battery operation with true network benefits and importantly allow battery households to stack the value they provide in both networks and the wholesale market when they export.

By requiring networks to implement cost-reflective pricing that accurately reflects network constraints and properly rewards battery behaviour, there will be greater incentives for retailers and aggregators to pass through the true value to VPP consumers. This will help unlock the full potential of batteries to alleviate network costs and participate in the wholesale market rather than simply lead battery users to avoid network charges by maximising self-consumption.

State governments work with networks to target installing distributed batteries where they are needed most.

State governments should require networks to advise where network constraints occur and link battery subsidies to the locations where they exist. This should be done either through pricing or contracts which require battery capacity to be available when and where they are needed. This can ensure distributed batteries are used to the greatest extent possible to reduce distribution network costs, avoiding the need for network augmentation.

AEMO monitors how VPPs are being operated in practice to ensure system benefits are delivered.

AEMO's CEO Daniel Westerman has noted that household batteries used primarily for self-consumption already provide important benefits to the electricity system. However, he also emphasised that additional system value can be unlocked when batteries are coordinated through VPP.[22]

Some jurisdictions, including New South Wales and Western Australia, offer additional VPP-linked incentives, allowing households to access further savings on top of the Cheaper Home Batteries Program by joining a VPP.[23] However, it is not yet commonly understood what a VPP is, what services household batteries should provide, and whether VPPs are being used to support these goals in practice.

Relatedly, it is important to examine whether the additional system-wide benefits delivered through current VPP participation are materially greater than those achieved through simple self-consumption. This will help determine whether it is in consumers' interests to require households receiving a government-subsidised battery to enrol in a VPP.

Monitoring will need to consider both wholesale market outcomes and network impacts and trade-offs. While wholesale and network objectives are often aligned, particularly during periods of high demand, there may be instances where they diverge. For example, batteries responding to low wholesale prices may increase charging during the middle of the day. In areas with high levels of battery uptake this could create localised network constraints.

Governments — potentially through the AER — should ensure households receive a fair share of the value generated through VPP participation.

Although VPPs can provide system-wide benefits, there is uncertainty about how value is shared between participating households and VPP operators. Information asymmetry between providers and consumers, combined with limited transparency in some VPP offerings, makes it difficult for households to assess whether they are receiving an appropriate return.

Governments should improve transparency and reward sharing. This could include incorporating VPPs into Energy Made Easy to make them easier for consumers to compare, and introducing a minimum revenue-sharing requirement for households to ensure more equitable distribution of benefits.[24]

Appendix 1 – Overview of sample and method

This analysis is based on data from **Consumer Energy Report Card** June 2026 Survey. The raw data, and information on the methodology can be found here.

The dataset used in this report is publicly available. For further details, please contact Elham Hajhashemi at elham.h@energyconsumersaustralia.com.au or Ashley Bradshaw at ashley.bradshaw@energyconsumersaustralia.com.au.

References

[1] The Energy (2026). *Time to give up on VPPs?* Retrieved from https://theenergy.co/article/time-to-give-up-on-vpps.

[2] Solar Choice, "What is a Virtual Power Plant (VPP)?", accessed 26 May 2026, https://www.solarchoice.net.au/solar-batteries/vpp/

[3] Mollard, V. (2025) *The energy revolution in our homes*, Australian Energy Market Commission, 3 December, available at: https://www.aemc.gov.au/news-centre/speeches/energy-revolution-our-homes

[4] AEMC. (2025). Energeia finds that CER flexibility could deliver $45B in benefits by 2050. Retrieved from https://www.aemc.gov.au/energeia-finds-cer-flexibility-could-deliver-45b-benefits-2050

[5] AER (2024). Wholesale markets quarterly Q1 2024, available at https://www.aer.gov.au/system/files/2024-04/Q1%202024%20Wholesale%20markets%20quarterly%20report.pdf

[6] ACCC. (2026). *Inquiry into the National Electricity Market report – June 2026*. https://www.accc.gov.au/system/files/inquiry-national-electricity-market-report-june-2026.pdf

[7] Government of South Australia, *South Australia's Virtual Power Plant*

[8] ACCC. (2025). *Inquiry into the National Electricity Market: July 2025* (Report). Australian Competition and Consumer Commission. https://www.accc.gov.au/system/files/inquiry-national-electricity-market-report-july-2025.pdf

[9] SolarQuotes. (2024). South Australia's VPP REPS rebate explained. Retrieved from SA's REPS VPP Rebate: Boost Your Home Battery Subsidy

[10] SolarQuotes. (n.d.). *Solar battery rebates in Australia*. https://www.solarquotes.com.au/battery-storage/rebates/

[11] Australian Competition and Consumer Commission. (2026, July 10). *Growing home battery uptake delivering lower electricity bills, but consumer protections needed*. https://www.accc.gov.au/media-release/growing-home-battery-uptake-delivering-lower-electricity-bills-but-consumer-protections-needed

[12] ACCC. (2026). *Inquiry into the National Electricity Market report – June 2026*. https://www.accc.gov.au/system/files/inquiry-national-electricity-market-report-june-2026.pdf

[13] Australian Energy Regulator. (2025). *Default market offer prices 2025–26: Final determination*

[14] AER. Network tariff reform. See https://www.aer.gov.au/about/strategic-initiatives/network-tariff-reform.

[15] AER (2026). 2026–27 – Consolidated stakeholder report – 20 May 2026, available at https://www.aer.gov.au/documents/aer-2026-27-consolidated-stakeholder-report-20-may-2026 and Ausgrid. Time of use prices, available at https://www.ausgrid.com.au/your-energy-use/smarter-energy-use/understanding-network-tariffs/time-of-use-pricing

[16] AER (2025). 2025 State of the Energy Market, available at https://www.aer.gov.au/publications/reports/performance/state-energy-market-2025

[17] AER. (2026). Prices above $5,000/MWh – October to December 2025, available at https://www.aer.gov.au/publications/reports/performance

[18] WattClarity. (2025). *Price spikes up to the MPC in NSW seemingly out of the blue during the middle of Tuesday 25th Nov 2025*. Available at: https://wattclarity.com/articles/2025/11/price-spikes-up-to-the-mpc-in-nsw-seemingly-out-of-the-blue-during-the-middle-of-tuesday-25th-nov-2025/

[19] ABC News. (2025). *Claims AGL drained household batteries spark trust warning*. Available at: https://www.abc.net.au/news/2025-05-09/claims-agl-drained-household-batteries-spark-trust-warning/105234050

[20] AEMC. (2025). Energeia finds that CER flexibility could deliver $45B in benefits by 2050. Retrieved from https://www.aemc.gov.au/energeia-finds-cer-flexibility-could-deliver-45b-benefits-2050

[21] ACCC. (2026). *Inquiry into the National Electricity Market report – June 2026*. https://www.accc.gov.au/system/files/inquiry-national-electricity-market-report-june-2026.pdf

[22] Reneweconomy. (2026). *Passive home batteries deliver "enormous benefits" to the grid, says AEMO – even if not orchestrated in VPPs*. https://reneweconomy.com.au/passive-home-batteries-deliver-enormous-benefit-to-the-grid-says-aemo-even-if-not-orchestrated-in-vpps/

[23] SolarQuotes. (n.d.). *Solar battery rebates in Australia*. https://www.solarquotes.com.au/battery-storage/rebates/

[24] Solar Citizens (2025). VPPs – key to our clean energy future, if we get them right. Retrieved from https://www.solarcitizens.org.au/vpps_key_to_our_clean_energy_future