Submission to Consultation paper The pricing review: Electricity pricing for a consumer-driven future

December 2024

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This submission is my personal input and does not necessarily represent the views of organisations with which I am associated.

I agree to publication of this submission.

Written submissions responding to this Consultation paper must be lodged with the Commission by 12 December 2024. To make a submission, go to the Commission's website, www.aemc.gov.au, find the "lodge a submission" function under the "Contact Us" tab, and select the project reference code EPR0097.

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Introduction

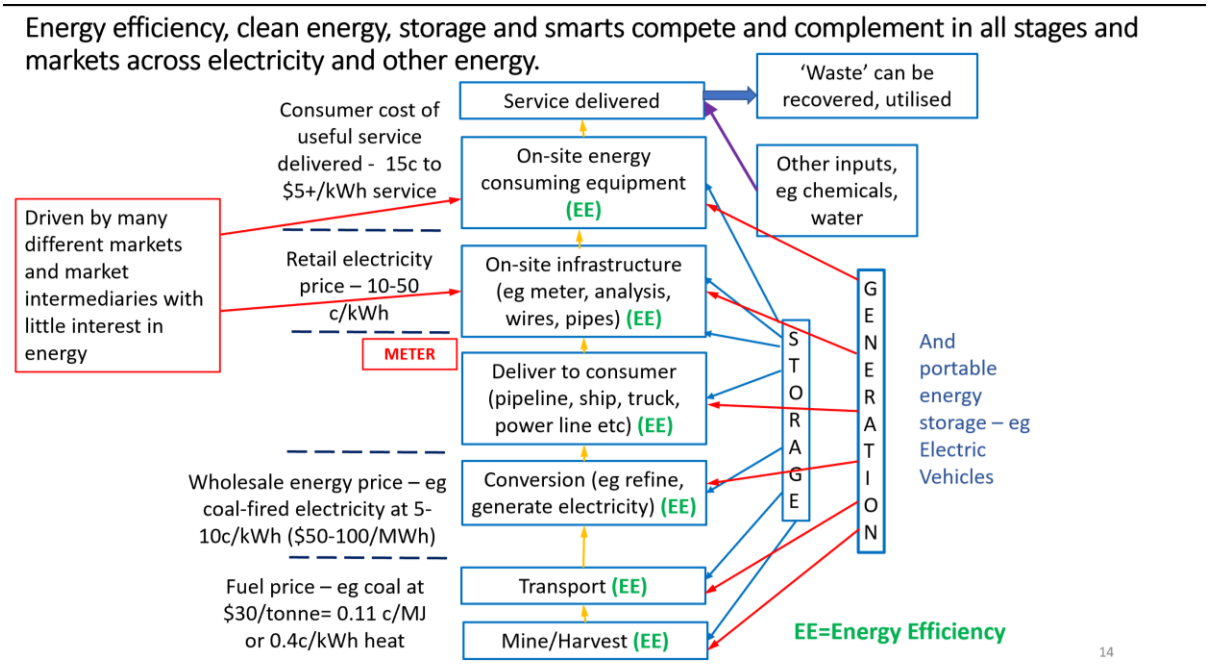
I have worked in the energy sector for over four decades, mainly on demand-side issues across all sectors of the economy, but also in relation to broad energy and climate policy and program development. I have played many roles, including working within the Victorian public sector, as a consultant, analyst, educator, commentator and community representative on various public processes.

This Review provides an important opportunity to reframe electricity policy to incorporate dramatic change in many aspects of energy.

Key Messages

The Consultation Paper provides a lot of useful information and examples of some of the emerging energy solutions. But its focus is still mainly on products and services being delivered by an evolving energy supply and services sector, not on energy fundamentals and some major consumer issues.

My submission attempts to reflect emerging changes and propose paths forward for energy and electricity policy. It is based on a more comprehensive model of the energy system than that presented in the Consultation Paper, as shown below.



Source: Alan Pears: slide used in presentations and lectures since 2015

In particular, 31 percent of households and many businesses rent, so they have limited capacity to make changes. Large numbers of households and small businesses also occupy properties controlled by Owners Corporations, who influence actions that involve building fabric, energy services and infrastructure.

More emphasis is needed on:

- Empowerment, regulation and financing of consumers and Owners Corporations to drive rapid and deep change
- Ways consumers can build confidence/trust in energy solution providers, regulators and policy makers
- Development and roll-out of 'plug-in' micro-storage, demand management, targeted energy efficiency and solar generation, as discussed later in this submission.

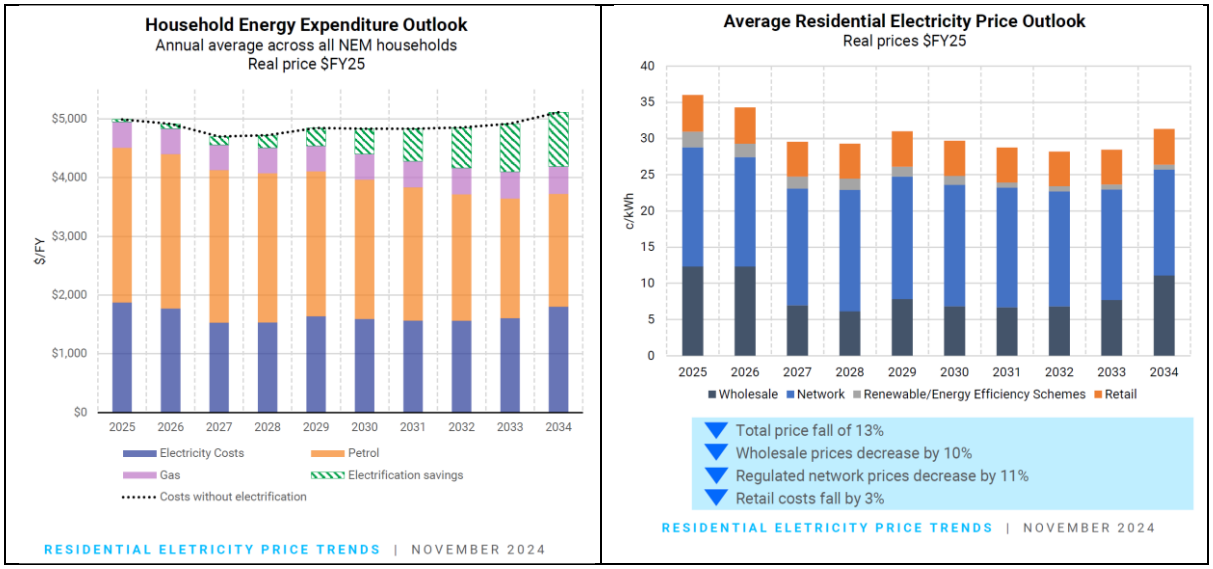
In framing of the archetypes and in the broader document there is limited focus on commercial and industrial consumers, particularly Small to Medium Enterprises. Many businesses across southern states are beginning to focus much more on energy issues, but struggle to make significant decisions, for reasons that include:

- Concern about availability, costs and price volatility of gas
- Confusion over retail electricity pricing, concerns about upgrading electricity supply capacity to their sites and other issues related to efficient electrification
- Emerging pressures to document, report and act on their carbon emissions as their larger business customers begin to report scope 3 emissions (the scope 1 and 2 emissions of their supply chains) under APRA requirements and to respond to customer climate concerns

Approaches to framing a consumer-focused approach

A recent AEMC report (https://www.aemc.gov.au/sites/default/files/2024-11/Price%20Trends%202024%20Final%20Report.pdf) presents forecasts of residential energy costs and the financial benefits of electrification. This raises several issues that require consideration in consumer-oriented approaches:

- The energy expenditure outlook ignores the consumer capital, installation and maintenance costs of electrification that can create significant barriers to change
- The graphs present 'real prices' over time. However, consumers respond to prices that include inflation, so they may see price increases. Further, the visible benefits of reducing consumption mostly relate to marginal retail electricity prices. High daily charges set by retailers can't be avoided under most present tariff structures. These reflect transmission, distribution and retailing costs, profits and diversion of risk to consumers, and comprise a large proportion of retail electricity prices.
- Low solar feed-in prices, risk of curtailment, and competition from low retail prices in sunny weather will complicate decision-making by consumers. Crude retail pricing structures, such as low daytime prices all year round, may lead to consumer investments that add to daytime demand in cold, cloudy weather when availability of variable renewable energy may be limited. However, they may reduce energy costs for those who don't have solar and/or battery storage, such as renters and occupants of Owners Corporation managed buildings.



Source: Residential electricity price trends 2024 A u s t r a l i a n E n e r g y Ma r k e t Commission 2024

Initial comments on the Consultation Paper

In this section of the submission, I respond to specific points by referring to page numbers and items.

p.i. It is impossible to adequately consider network and retail tariffs without also considering wholesale prices (especially when driven by the spot market), the impact of targeted energy efficiency on peak demand and capacity for increased demand flexibility. For example, openelectricity.org.au (tracking) graphs show quite clearly that periods of high electricity demand, especially when solar generation is low, and weather is extreme, require higher investment in electricity supply infrastructure (increasing network costs and reducing utilisation of capital assets) and often drive much higher wholesale prices at times when carbon emission intensity of the grid is higher and spot market prices are high. This requires change in the design of the spot market.

p.i add Item 4. A major driver of the behaviour of each player in the energy supply system is to maximise profit while holding onto customers and extracting maximum net profit from them, often when pushing market rules to their limits. As IEEFA (ieefa.org) has noted in several studies, there is evidence of 'superprofits' being captured by both regulated entities and market participants.

p.i item 6. Yes, radical change is under way across every element of the energy supply and service system, many aspects of which are not influenced or controlled by the energy sector, as shown in my earlier flow diagram. We must redesign energy markets and policy to incorporate a focus on demand-side action and the markets and policies beyond energy supply that influence them. A key issue is that the 'behind the meter' capital investment and non-energy costs consumers face are often not included in energy cost analysis. For example, upgrading building wiring when electrifying can be a significant cost and logistical challenge for consumers. Investments in appliances and equipment are also substantial. Decisions on these issues fundamentally impact on the cost and complexity of the energy supply system, as shown in the earlier diagram from my lectures.

p.ii items 12-15. Energy must be placed in context. For most consumers, energy is a relatively small proportion of living or business costs, even though fossil fuels dominate Australia's

carbon emissions. Many in the energy sector seem to think that 'rational' behaviour involves optimising energy costs. However, for most consumers, optimising energy costs is one small part of a much bigger picture of both financial and social decision-making. Energy sector participants commonly unconsciously apply 'bounded rationality' when they expect consumers to act on energy prices and tariff structures.

For example, in a recent training course for energy efficiency consultants I asked participants why they had bought air fryers. Not one mentioned to cut energy costs or improve efficiency. They had many other reasons, such as fast, tasty food for kids. Similarly when a consumer perceives handing control of their equipment to a third party, they perceive risk of adverse impacts on quality of life, household conflict and health. Businesses considering investment in unfamiliar technologies and supply chains perceive high risk, often seen as a requirement for fast 'payback' and credible performance guarantees.

p.ii items 16 to 19. Yes, we need a future-focused approach, but a much broader approach than framed in this consultation paper.

p.iii item 20. Consumer input will have to be much better funded and communication with consumers improved.

p.iii item 22. The starting point for analysis must be that no-one (including business decisionmakers) actually wants energy for its own sake. They want services they perceive to be useful or essential for their own use or to deliver products or services of value to their customers, as well as reliable, sustainable, safe services delivered by a trusted supplier. In many cases, key decisions with big impacts on energy ignore the energy consequences, as they are overwhelmed by more tangible factors.

Studies by Monash digital future researchers and community groups have reflected some of these realities.

This Consultation Paper is apparently intended to be a first step in a process, focusing on the preferences of a diverse range of consumers. This submission is an attempt to reframe the assumptions underlying this paper, and to influence future elements of this process.

p.iv. Consumer Preference Principles are certainly important. However, the first one is that the consumer wants services for which energy is one of many inputs, and which deliver a wide variety of outcomes. Their perceptions of what a 'useful or essential service' is vary widely. For example the main driver of a TV purchase may be to attract friends around to watch a major sporting or entertainment event.

When we focus on the perceived service and, beyond that, the fundamental physics and chemistry of provision of that service, we live in a very different world. For example, people want comfortable, healthy, sustainable and affordable homes, not heating and cooling, or complicated 'smart' controls.

The list of CPPs is actually dependent on this. The archetypes proposed focus on secondary issues, barriers and preferences.

Our perceptions, including those of the energy sector, are filtered by our past experiences, our training/education and our imperfect perceptions of what is possible.

p.vi. Consultation Questions

Meaningful answers to these questions must involve a framing of the radically different worlds various consumers will live and work in. I recognise that the archetypes and principles in the paper are a good start towards this goal, but we have a long way to go. Large shares of variable renewable energy options in the energy system, radical energy efficiency improvements, threats from extreme weather events that could wipe out the value of homes or businesses, and other factors may be top of mind. High fixed daily energy charges dilute the incentive to change, but higher marginal prices impact on vulnerable high-consuming households and businesses with high peak energy demand.

I don't have the time or resources to comprehensively respond in detail to the questions listed. I have tried to outline some of the issues and emerging options consumers may access in future.

What services do consumers want?

Key questions are:

- What services?
- Options for their provision (perceived and underlying services)
- Preferences for options and knowledge (or lack of knowledge or misinformation) on which decisions may be based
- Perceptions of risks and benefits of change.

The following outlines some examples of issues and opportunities regarding services and categorisation of consumer archetypes.

Comfort, health and amenity

These are complex services, and satisfaction depends a lot on age, health, capital and operating costs, sustainability, aesthetics and expectations. The ability of specific technologies to deliver these expectations in ways that maintain confidence of reliability and affordability, as well as media, marketing, experiences of friends, shape choices.

For example, my RMIT colleagues have found that elderly and frail households don't like reverse cycle air conditioners, because they just don't feel warm. An article we published last year in theconversation [https://theconversation.com/replacing-gas-heating-with-reverse-cycle-aircon-leaves-some-people-feeling-cold-why-and-whats-the-solution-213542] explained why the laws of physics were consistent with their perceptions. Comfort in extreme weather conditions is important.

We know that a thermally efficient dwelling using reverse cycle air conditioning should deliver comfort, very low energy bills, low capital cost of heating and cooling equipment and low peak energy demand. But designing and building such dwellings is tricky. A highly insulated, well-sealed dwelling with advanced glazing also requires very different management.

If glazing is not well shaded, solar gain can create a 'solar oven' not just in summer but also in autumn, when the sun is lower in the sky and even north windows can create overheating. When activities such as bathing, drying clothes and cooking without lids on pots generate large amounts of water vapour, mould, condensation and damage to building materials may occur. Oversized heating and cooling equipment may cycle on and off, creating discomfort. People may not open windows in the ways computer models have predicted if the local environment is noisy or they feel unsafe.

Very few Australians have ever experienced living in a well-performing home, so they are not necessarily competent to make informed choices, and often such choices are not available to them.

In theory, a 7-8 star rated home with reverse cycle air conditioning should have very low energy bills, low peak electricity demand and increased capacity to 'flex' demand, as HVAC equipment can be switched off or have output reduced for longer periods without causing discomfort. In practice, distortions in energy rating tools, poor construction pracrices and lack of education of occupants can mean the outcomes are very different, though still nowhere near as bad as most present Australian homes.

Effective 'deep upgrade' programs could transform the demand for residential and commercial building heating and cooling. But this would require aggressive building upgrades, education of occupants, and changes in appliances not generally recognised as important for heating and cooling. We also need serious consumer-oriented research and technology/product development, but we have shut down many of the facilities that could do this, such as energy utility R&D centres, CSIRO's building research centre and university programs such as RMIT's Centre for Design.

Clothes drying and cooking

Drying clothes after washing can release a lot of water vapour into a home. Depending on the type of washing machine, 5 kilograms of clothing may release 2 to 10 litres of water vapour as it dries. If the clothes are dried by an unvented traditional clothes dryer or on an indoor clothes rack, this water vapour will increase humidity and create significant condensation and potential mould problems. A heat pump clothes dryer not only uses 1/3 to 1/4 as much electricity to dry clothes, but it also condenses all the water removed from wet clothes, avoiding the humidity problems created by a traditional clothes dryer or indoor drying rack. Its peak demand is typically half to a third of a conventional dryer. Many apartment Owners Corporations ban drying of clothes on balconies, which increases the chances of occupant behaviours risking condensation and mould.

Cooking food without a lid on the pot evaporates a lot of water (using energy) that may also add to condensation and mould problems. This may lead people to leave windows open at times that increase energy waste. Running an exhaust fan for a long time to remove water vapour from cooking, showering and other activities can dramatically impact on energy use by drawing in more hot or cold outdoor air. Yet the National Construction Code now requires bathroom exhaust fans to be linked to having bathroom lighting on, as a very imperfect way of dealing with the condensation and mould problems.

Showering and hot water demand

Shifting from off-peak electric water heating to a heat pump HWS typically saves as much electricity as an Electric Vehicle consumes when travelling 35 kilometres per day, the Australian average. Over a third of homes have off-peak electric HWS. Innovative hot water heat pump designs could be installed in apartments without requiring external equipment or Owners Corporation permission.

Showering is now a major contributor to household water use and energy bills.

Water authorities have worked hard to encourage adoption of water-efficient showerheads, and the National Construction Code requires 3-star showerheads. However, many people are

dissatisfied with the 'shower quality' of water-efficient showerheads, so they buy water-guzzling replacements at hardware stores.

The laws of physics can explain this situation.

First, a water-efficient showerhead delivers significantly less heat to the shower cubicle. As heat is released into the shower cubicle, it creates a convective air flow: warmed air rises out of the top of the cubicle and draws cold air in. This evaporatively cools people's legs. The trend towards open shower cubicles adds to this problem.

This issue can be resolved. A sealed door on the cubicle blocks flow of cold air into the cubicle. A 'lid' on the top of the cubicle blocks the flow of warm air out the top of the cubicle – products such as the 'Showerdome' do this. A water and energy efficient showerhead can then deliver a comfortable shower while saving water and energy and reducing condensation and risk of mould growth.

Transforming Compressed Air systems in industry

Compressed air systems are believed to consume around 10 percent of industrial electricity, and real world system efficiencies are typically 10 to 15 percent. Compressed air is often described as 'the fourth utility' because it is used to deliver many services. I authored an analysis of the potential to transition away from compressed air to a range of other much more energy efficient options that also offer business productivity benefits and integrate with digitalisation (see https://www.a2ep.org.au/compressedair and c1ceb4_d266b903584b49879de7ecfbe8b70b5e.pdf). Adoption of these opportunities is in its very early days.

Interactions between reframing service requirements and energy demand and consumption

Energy policy development often seems to ignore much of the potential for radical change, and the circumstances of many consumers.

As noted earlier, over 30% of Australian households are renters, so they have little or no control over any energy-related issues beyond their electricity sockets. How might creative businesses offer solutions for them 'behind the meter'? We are seeing options such as plug-in 'balcony PV' in Germany and battery-boosted induction cooktops in the USA that avoid the need for wiring upgrades. Many modern appliances use remote controls, which can be modified to deliver more sophisticated control without having to replace the appliances. Reverse cycle air conditioners don't create high electricity demand if the area heated is energy-efficient. In extreme Melbourne weather by 35 square metre living area is heated by an RCAC that uses around 700 watts. Most of the time it uses much less than this.

Small modular batteries plugged in to power sockets that appliances can plug into can potentially transform electricity demand and offer demand response capabilities to 'dumb' appliances. Many present appliances have high peak demand but don't use much electricity, so a combination of grid supply, micro-storage on the consumer side of the power socket, and smart management could transform electricity demand profiles and consumption.

Commercial and industrial businesses face many uncertainties, and many are unprepared for dramatic change after 50 years of cheap gas. At present many service providers lack expertise,

for example they may propose ‘like-for-like’ technology solutions when smart, flexible and efficient options with lower capital costs and potential to generate revenue are available.

What’s possible?

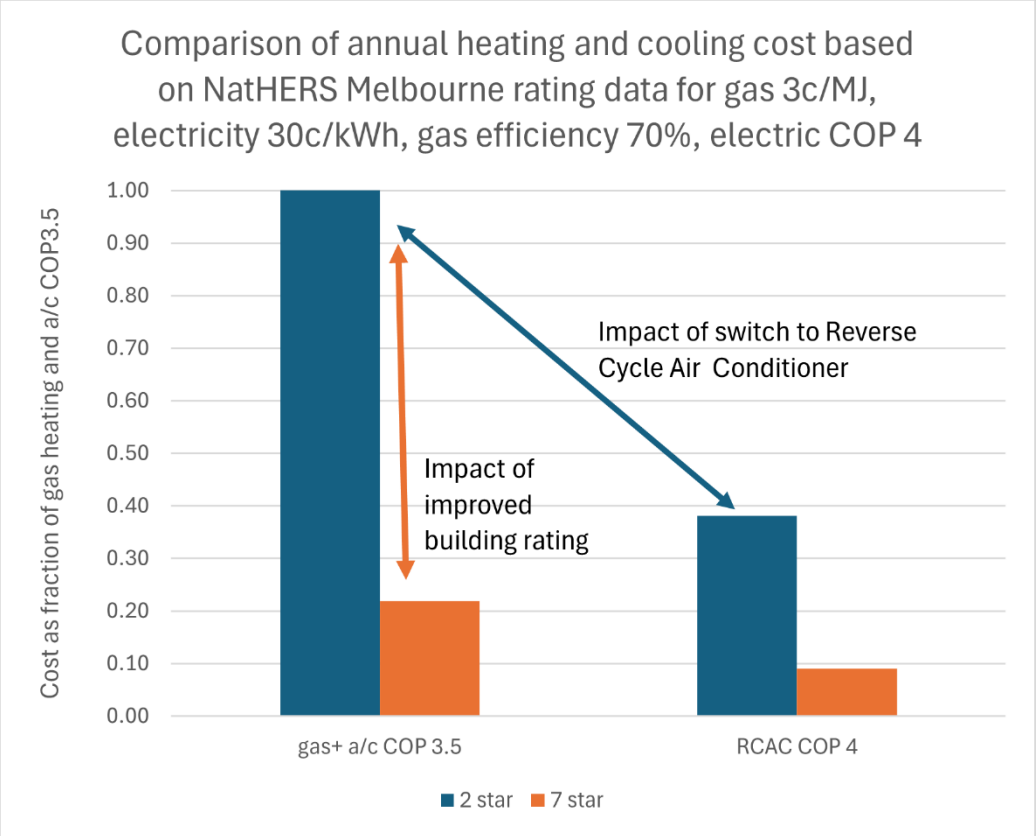
Most thinking on energy options is ‘top down’. A truly ‘bottom-up’ approach would be based on the physics and chemistry associated with ‘ideal’ provision of a service, combined with energy efficiency, low cost modular technologies and recognition of consumers who want to ‘defend’ themselves from energy suppliers and risky third party solutions. This may look very different.

A typical all-electric Australian household now seems to consume around 10,000 kWh/year, while an average mixed fuel household uses around 4,000 kWh – though this is distorted by the impact of almost 40% of households having rooftop solar and the use of gas reduces electricity consumption. My analysis suggests that an efficient all-electric household might use 1500 to 3000 kWh/year – with solar further reducing this.

Efficient appliances offer significant savings, as shown below. The appliance stock includes many old and/or faulty appliances, but we have little data on which to base estimates. An old, faulty fridge could possibly use five times as much electricity as an efficient new model.

As noted earlier, adding EVs may have less net impact on overall electricity consumption if combined with measures such as replacement of electric water heaters. Their large batteries offer significant potential to deliver demand flexibility. However, if an EV is actually being driven in extreme winter weather, it is a net consumer of electricity over a multi-day cold period.

Shifting from gas or resistive electric heating, which is widely used in milder climates and in Tasmania, to heat pumps combined with thermal efficiency improvements will also impact on electricity consumption and peak demand.



At present, rapid adoption of air conditioners in thermally poor buildings is increasing summer peak demand, volatility of demand and spot electricity prices. That doesn't necessarily reflect our longer-term future as we upgrade building efficiency.

31% of Australian households are renters who have little control over anything beyond their powerpoints or on the thermal performance of their homes. Many businesses are in a similar situation. So development and adoption of 'plug-in' smart/battery/efficiency solutions, as outined earlier, offers potential for dramatic change. This is not just for renters, but also for the many households that have tight cashflows and can't afford 'whole home' PV, battery and smart solutions and their installation costs.

Plug-in' solutions that incorporate demand response capability and micro-storage using E-bike batteries, balcony PV systems now rolling out in Germany (up to 800 watts capacity) and more efficient appliances can change the game by avoiding significant installation costs and demand for tradies. In the USA, smart battery boosted induction cooktops avoid the need for expensive wiring upgrades.

Redesigned heat pumps for hot water and space conditioning that use factory sealed refrigerants and simplify installation can accelerate change. Indoor heat pump HWS units are feasible, and would transform adoption by renters and apartments controlled by Owners Corporations who may block changes impacting on the building fabric. The debate over aesthetic impacts of drying clothes on balconies can be overcome by heat pump clothes dryers and foldable 'tents' on balconies.

While many people express concern about the energy use of AI and more streaming, the reality is that the standby power requirements of inefficient NBN equipment, routers, etc are also significant. The most efficient computer monitors use much less electricity than typical products – see energyrating.gov.au.

Regular cleaning of filters in reverse cycle air conditioners can save a lot of energy and improve output capacity – if users are alerted to the importance of clean filters.

In apartment buildings, smart solutions such as Allume's solshare system can optimise behind the meter usage of solar generation to benefit households.

Management of charging and discharging of EVs and consumer-side batteries offers significant potential – but, as noted earlier, we must remember that an average EV is a net consumer of electricity in cold, low solar periods, so they are not miraculous.

Smart management of transmission and existing hydro resources, combined with targeted efficiency improvement can deliver big benefits. The IEEFA paper I co-wrote with Amandine Denis-Ryan in March 2024 (https://ieefa.org/resources/optimising-battery-nation) showed how stored water in Tasmania could be 'hoarded' in dams by improving end use energy efficiency and purchase of cheap or negative-cost renewable electricity from Victoria, which could make more stored water available to sell at high prices in winter. Cooperation with distributed batteries could allow hydro to charge short-term storage batteries so they could help to manage supply requirements over multi-day low solar periods. Upgrading residential and commercial energy efficiency would mean the 'prudent water storage level' (to cope with low rainfall periods) could be reduced, making more stored water available without impacting supply security.

Commercial and industrial issues

The above discussion has focused on households, which comprise less than 30% of electricity consumption – though they contribute much more to peak demand challenges.

My experience in analysing commercial and SME/light industrial energy use suggests that the potential for improvement in energy efficiency, demand management and electrification is far greater than generally recognised in Australia. The International Energy Agency, in its latest energy efficiency report, suggests that the less energy intensive businesses and industries can deliver substantial energy efficiency and emission reductions. Many of these businesses are retail energy consumers.

At present, we do not have the data or the expertise to drive optimal change. Nor do we have the institutional and supply chain capabilities that are needed.

Our businesses and industries use gas-sourced steam for many services that do not need such high temperatures, and are inefficient. Few of our engineers and consultants have been trained to design efficient, flexible electric systems. It is interesting that a number of New Zealand electrification consultants are now moving to Australia: they have not been brainwashed by the past availability of cheap gas.

These comments are based on my involvement over the past four decades in development and implementation of a number of commercial and industrial efficiency and emission reduction schemes, policies and site level analyses. My recent work with the Australian Alliance for Energy Productivity and the Energy Efficiency Council has reinforced these views.

Significant change is emerging as several factors play out:

- Emerging requirements for large businesses to report on Scope 3 emissions from their supply chains and use of their products by consumers – this is flowing through to pressures on smaller businesses by their major customers for monitoring and reporting of their scope 1 and 2 emissions. This is also focusing company boards and senior management on energy-related carbon emissions
- Digitalisation and connection, which support value chain and circular economy models, as information and financial transactions can be shared across businesses. Financial, energy and resource inefficiencies at interfaces between businesses are being identified and addressed A2EP reports (see a2ep.org.au and racefor2030.com.au) explore some of this potential.
- Innovation in design and management of electric equipment is accelerating as decarbonisation through efficient electrification gathers pace. For example, heat pump efficiencies and temperature outputs are increasing while creative design is allowing them to overcome barriers such as lack of space on commercial and industrial sites. Combining energy storage with efficient electrification is helping to limit wiring upgrade costs and enhancing demand flexibility.

Consumer Preference Principles

My comments on the proposed principles are shown below:

1. Value is perceived in many ways by different consumers – and may not reflect reality

2. Consumers want energy-related *services* when they want or need them - reliably. But they may adopt options that remove or change the time and scale of energy requirements
3. They need to be able to understand the options
4. There must be an appropriate range of easily selected options available
5. They want to feel able to trust long-term, and may want to 'defend' themselves from perceived future exploitation – independence/respect

What about renters and occupants with Owners Corporations? And business consumers – who want to be able to service their customers or staff?

It's not just about engagement with the energy market, as provision of many services may involve alternatives to electricity or agents outside the electricity sector, as shown in my earlier flow diagram.

I appreciate that it is difficult to categorise consumers into manageable groups!

Chapter 4 comments

Q4. It is important to recognise that many Australians are not very numerate, nor do many understand the laws of physics. Many issues compete for their attention. They listen to trusted networks. They want their friends and neighbours to respect them. For example, the high rate of adoption of rooftop solar in some relatively low-income areas seems to have been influenced by people proudly showing their neighbours their negative summer electricity bills. A barrier to energy efficiency is that it often delivers only incremental reductions in energy bills, that may be masked by annual increases in prices.

I was involved in development of the appliance energy rating label. Our market research showed that many people did not even understand what a percentage saving meant. Most people had stayed in a hotel, so they knew that 'more stars' was better. Too much clutter on the label would undermine its effectiveness.

Q5. As shown in my earlier diagram of the energy system, energy is just one element of a much bigger system in which changes isolated from obvious links to energy influence energy outcomes. A focus on tangible and valued benefits of a service involving energy (or using it in smarter ways) is fundamental to gaining attention.

Q6. Consumer protection is a very difficult issue. Strong and high-profile government standards that are visibly enforced are crucial: my impression is that not many consumers believe that energy regulators and policy makers are really on their side. The language of 'economic' regulation sends a warning, and spikes in energy prices, high prices at times when people see energy as 'essential' and 'big brother' behaviour by energy businesses don't help.

Large numbers of small emerging competing businesses offering rapidly changing and confusing products do not reassure consumers that a warranty will mean anything. A history of poorly communicated price changes and price volatility does not build trust. Many consumers see public ownership as an indicator of stability, but publicly owned energy agencies have fallen short.

Even local community groups gain limited consumer confidence: they are seen as well-intentioned, but outgunned by the big energy businesses, not backed-up by governments. They often don't have the technological capability needed to build confidence.

Q7. The issues outlined above illustrate the barriers. Maybe a government guarantee that a consumer who installs rooftop solar will receive a guaranteed minimum feed-in price for 5 years might help. Consumers get nervous when AEMO talks about curtailing output at times when electricity prices are likely to be high, even if it may be rare. And if the curtailment technology is crude, and shuts down their PV system at those times, they won't even be able to use their PV generation for their own use at those times, so they will face high prices at times that matter.

Maybe a 'reasonable' flat electricity price combined with quarterly bonuses linked to lower consumption at key times might be more attractive. Bonuses must be big enough to attract consumer attention. Perceived risk of higher costs discourages engagement and reinforces negative reactions.

Section 4.2 Network tariffs

Network operators are often blamed for high fixed charges. But energy retailers use these charges as 'cover' to add their own fixed charges to shift cost risk onto consumers. Failure of regulators to make adjustments after network operators overstate estimated costs, leading to 'super profits' that are not recovered by regulators, as documented by IEEFA, do not build consumer confidence in regulators.

In reality, many businesses that incur large fixed costs do not pass them on to consumers as fixed costs. For example, gas and oil explorers, resource producers, restaurants and many other businesses accept that they have to carry risk. They build fixed costs into unit prices.

So I do not understand why high fixed charges for energy are 'efficient', especially when they are applied with 'postage stamp' pricing.

Networks are not 'natural monopolies'. For example, the LPG industry (eg Elgas) is now pointing out to gas consumers that, if their gas consumption is relatively low, 'bottle' LPG (with a higher unit price) is cheaper than grid gas because consumers can avoid fixed charges for connection to the gas grid.

In future, more electricity consumers may find it is cheaper and supply more reliable to disconnect from the grid, as is happening in Western Australia, as noted below.

At present, most consumers and energy 'experts' assume that connection to the electricity grid is essential. Peak demand costs are smeared across all consumers. Postage stamp pricing means those with low peak demand and in urban areas subsidise those with high peak demand and in rural areas.

Western Australia is shifting rural consumers off the grid because over half of their grid services 3 percent of their consumers. Reduced line losses, reduced fire risk and reduced maintenance costs seem to be shifting the business model. At present, losses in Single Wire Earth Return powerlines in rural areas can be very high, especially at times of peak demand. Improving energy efficiency and managing demand of consumers on SWER lines, or taking them off-grid as WA is doing seem to be untapped opportunities to reduce east coast consumer costs.

Radically different business models could allow many electricity consumers to disconnect from the grid.

In my own situation as an efficient all-electric household, my average annual daily consumption is 4.5 kWh/day, with peak winter days double that. A grid-interactive EV (a mobile battery) could get me through extreme winter periods if it is charged elsewhere. Further improvement in my

home's thermal performance could reduce peak demand. Plug-in, smart micro-batteries could limit peak loads on my home wiring, avoiding consumer-level wiring upgrade costs that are ignored in energy market analysis. They could charge in periods of excess solar generation.

Options such as 'battery trucks', semi-trailers with trailers loaded with batteries that could top-up consumer batteries could provide reliable, low cost electricity for consumers that have disconnected from the grid. These portable batteries could provide rural EV charging and emergency power for communities impacted by extreme weather events.

Network operators charge 'postage stamp' prices, but many rooftop PV owners actually reduce loads on local networks most of the time. Local batteries (either behind the meter or at neighbourhood level) can reduce risk of 'reverse flows' and associated network upgrade costs. But as soon as electricity crosses a property boundary, it is 'owned' by the network operators, so network level energy storage is often not economic for communities. I don't understand why governments are subsidising network operator-controlled community batteries. These seem to increase the market power of the DNSPs and allow them to avoid investment in network infrastructure. And retailers may also take a slice of the money.

In my view, network tariffs are NOT a fundamental element of electricity pricing structures.

Section 4.3

In the 1980s, the State Electricity Commission of Victoria introduced time of use pricing. This was quickly labelled as the 'dual income no kids' tariff, as it offered low prices overnight and on weekends. Pricing structures that involve higher prices at times when many consumers see electricity as an essential service will always struggle for acceptance. The electricity industry, regulators and policy makers must work around this reality.

Many markets already cope with this. For example, buyers of goods over much of the year subsidise discounts in supermarkets and on 'Black Friday'.

Q8. I don't know what electricity pricing will look like in the future, but it will be very different from the present situation when crude network pricing is the biggest component of consumer energy cost for most consumers and retailers also manage to make big profits.

Q9. We come back to a fundamental. No-one wants energy for its own sake. In future, energy costs are likely to be integrated into business models that deliver valued services, consumer confidence and empowerment.

Chapter 5

The NEO is fundamentally flawed, so why should AEMC be bound by it when exploring a consumer-led future? Its focus on low energy prices distorts all thinking: it should refer to 'costs' not 'price'. The text points out that AEMC can only recommend changes to the *regulatory framework* that are likely to help meet NEO objectives. That should not limit its efforts to understand and highlight issues of broader relevance to electricity policy. Failure to look beyond the NEO would ensure that the outcomes of this review would be quickly outdated. The recent addition of a climate criterion to the NERO also provides a basis for a broader approach.

The present NERO's focus on 'efficient' investment and operation implies a narrow 'economic' perspective, which is very different from a broad societal economic, social and environmental framing. Its focus on targets set by participating jurisdictions implies that they know where our

energy sector should head. They don't. In a context of reducing Australia's greenhouse gas emissions the reality is that we are using the wrong indicators, as explained in my recent article (see https://johnmenadue.com/we-are-sending-the-wrong-message-by-focusing-on-annual-carbon-emissions-based-on-100-year-global-warming-potential/).

Q11. The proposed criteria for the review are too narrow, as outlined above.

An Observation on Effective Consultation

It was quite difficult to find information on the AEMC website regarding this consultation. None of the website headings refers to consultation, nor do the drop-down lists of topics. A search for 'consultation' turned up the topics shown below.

There seems to be a need for AEMC to improve its communication to consumers regarding engagement.