

The AEMC's Power of Choice does not support future Energy Markets

Dr Martin Gill

The Australian Energy Market Commission promised its 'Power of Choice' smart meter rollout would support Australia's future energy markets. Instead consumers are forced to install meters offering no benefits and alarmingly the meters don't even support current and future metering requirements. Flexible, innovative and cost effective market based solutions can be easily identified, but are being ignored.

Introduction

The Australian Energy Market Commission (AEMC) introduced major metering reforms under the banner of the 'Power of Choice'. The reforms promised to empower consumers enabling them to 'choose the metering they required at the price they were prepared to pay'. The final reforms failed to give consumers *any* choice. Consumers are unable to specify the meter, services it supports nor restrict who can access the highly invasive data the meters collect.

Recently several state Governments have acknowledged the deficiencies of the AEMC's (so called) smart meters. These Governments have introduced rules ensuring more capable meters are installed. The changes ensure the meters measure the output of consumer installed solar systems. The truth is even these more capable meters will soon be shown to be deficient.

The AEMC smart meter rollout does not support Australia's transition to a clean energy future

The AEMC metering reforms assumed installing a smart meter would "magically" make grids operate more efficiently. Instead evidence shows exactly the opposite, with the meters failing to make the measurements required to maintain grid security as consumers continue to install local generation and flexible loads.

The key question for the AEMC becomes "**How to efficiently make the measurements required to support the grid of the future?**" Installing more expensive smart meters is **not** the answer.

Necessary measurements are already available and can be accessed via market driven principles. The challenge for the AEMC now becomes how to remove the barriers preventing the use of these cost effective and innovative solutions. Doing so will create the very competition the AEMC hoped for, but failed to deliver, through their Power of Choice metering reforms.

Summary of Submission

The AEMC's Power of Choice

- fails to meet the needs of Australia's future energy market
- fails to create innovation and competition in the provision of meters and metering services

The failure of the AEMC's mandated smart meter rollout to meet the needs of Australia's future energy market is deeply concerning. Existing meters cannot (cost effectively) provide the measurements needed to manage increased consumer installations of solar and storage (both standalone and EV).

Cost effective market based solutions can be readily identified. The barrier lies with the AEMC who continue to support outdated rules to support their expensive meter rollout.

Draconian method of ensuring grid stability

In a report to the South Australian (SA) Government the Australian Energy Market Operator (AEMO) raised concerns grid stability was being compromised by a failure to directly measure the output of domestic solar systems. Following AEMO advice the SA Government mandated the installation of additional metering to separately measure solar system output.

The AEMO "solution" is a short sighted knee-jerk reaction to a recognised problem. Unfortunately it does not address future market requirements.

Consider AEMO has already expressed concerns about the impact of battery storage on the grid. Applying their current approach indicates a third meter will be required to separately measure battery storage systems. A fourth meter required to monitor impacts of EVs. Consumer participate in the ESB's two sided market will require even more meters. While the installation of 5 to 6 meters at each site may ensure AEMO can continue to provide grid stability, such draconian steps are impractical, not cost effective nor viable in the long term.

Allow innovative solutions

The SA rules requiring separate metering also specified the domestic solar system must be capable of being turned off remotely.

AEMO prepared a technical specification enabling them to turn off solar systems. AEMO's specification was to be implemented by distributors. Luckily the SA Government ignored AEMO's solution and chose a market based approach. This approach specified the desired outcome, not how it was to be implemented.

The market approach has been highly successful. Less than 6 months after the new rules were introduced over 40 Relevant Agents¹ are listed on the SA Government website. The same strategy can, and should, be applied to future metering requirements.

First a clarification

Australia's National Measurement Act requires all measurements used for billing be made by approved devices. In the case of electricity bills the measurements must be made by an electricity meter approved by Australia's National Measurement Institute (NMI).

The solar measurements ensuring grid stability are NOT USED TO BILL CUSTOMERS

Separate measurements of household use and solar system output are NOT used to calculate consumer bills (the bill is calculated on NET energy flow). There is no legal requirement solar be measured separately using an expensive NMI approved meter. Cheaper flexible alternatives are available.

Cost effective solutions are available

Rather than mandating an expensive meter based solution AEMO should have specified they require 'separate measurement of solar system output' <Full Stop>. This specification leaves the market free to determine how to deliver the measurements.

Of the 42 Relevant Agents currently listed on the SA Government website only two use NMI approved meters. The remaining 40 choose to offer innovative and demonstrably lower cost solutions.

For example several Relevant Agents meet the requirements by communicating directly with the

consumer's solar inverter. In addition to being able to turn off the inverter the communications can be used to adjust inverter settings (providing enhanced autonomous grid stability benefits) and critically for this discussion, obtain energy readings. Hence the one solution delivers multiple benefits all for the same low cost.

AEMO's expensive meter based solution also has a major technical failing. As solar system prices have decreased consumers are installing larger solar systems. The average domestic solar system size now exceeds 7kW. Grid connection agreements limit single phase inverters to a maximum size of 5kW, but still allow consumers to install 30kW systems, provided they are three phase. Increasing numbers of these large three phase systems have a greater impact on grid stability than single phase systems, but AEMO's meter based solution is only applied to single phase systems! This failing highlights AEMO's meter based solution does not even meet current requirements, let alone future requirements.

Communications with inverters works for both single and three phase systems

"But each inverter uses a different data format"

One argument being presented to protect the use of expensive NMI approved meters is the lack of a common solar inverter protocol and data format. The argument is false.

Critically NMI approved meters also do not specify a common protocol or data format. Instead Meter Data Providers are required to read the data from their meters and convert it to an AEMO defined market format. Once converted the data can be used by all parties.

In exactly the same way Relevant Agents could collect the data from their solar inverters and convert to the AEMO defined format. This solution avoids the need to agree a common inverter protocol.

¹ Relevant Agents offer to control consumer installed solar systems. They are free to choose how to achieve this.

Accurate forecasting of domestic solar output

AEMO received significant funding to develop their Distributed Energy Resources Register (DERR). At the time AEMO assured the AEMC the significant investment would enable them to accurately forecast the impact of domestic solar systems on grid stability. AEMO's subsequent advice to the SA Government shows the DERR fails to deliver the promised benefits.

The result was entirely predictable due to huge variations in the performance of domestic solar systems. A lack of monitoring and maintenance means many systems perform below forecast outputs (some earlier estimates suggest around 10% of systems have failed!). Domestic systems are mounted on available roof space resulting in a wide variation in East/West orientations and intermittent shading. The DERR was never going to be able to adequately capture these variations which is why AEMO now requires measurements.

Adding Battery Storage including EVs

The price and therefore value of excess domestic solar generation flowing to the grid continues to fall. Using excess solar generation to charge a battery or EV can increase the value of excess solar from the wholesale feed-in rate (~5c/kWh) to the retail rate (~30c/kWh). The difference provides financial benefits for those consumers able to afford battery storage/EVs.

Using solar to charge batteries/EVs creates further issues for AEMO's forecasts. Given the DERR cannot accurately predict the impact of domestic solar systems it takes a huge leap of faith to believe it can adequately predict the grid impact of using variable solar system output to charge batteries/EVs.

Estimating grid impacts of battery storage and EVs once they start sending power to the grid (including Virtual Power Plants and Vehicle-to-Grid) will be even more problematic for AEMO.

It is only a matter of time before AEMO acknowledges the lack of visibility of batteries and EVs compromises network stability. Lessons from SA indicate they will then request separate measurements of solar and battery storage. Making these measurements using NMI smart meters would be infeasible.

A meter based solution is too limited. Meters only measure the flow of electricity to and from the battery. A meter cannot determine the state of charge

of the battery. A meter cannot even determine if an EV is plugged in! This information is important when determining grid impacts since it defines how much solar the battery/EV can absorb and how much energy it can deliver. Metering is not the solution.

It is generally acknowledged controlled charging of EVs will be required to avoid adverse network impacts. Critical to these calculations is how long it will take to charge the EV but this value cannot be estimated using a meter. It **can** be obtained directly from the EV charger.

Taking lessons from SA: future approaches should not prescribe solutions. Instead they should define the requirement leaving the market free to innovate. For example rather than specifying *how* to deliver controlled EV charging and separate energy measurements state this as a requirement leaving the market free to innovate. Those choosing to communicate with the inverter/charger can then provide controlled charging and battery/EV state of charge, something meter based solutions cannot.

From the AEMC's perspective such an approach offers multiple advantages:

- it is technology neutral
- it satisfies future market requirements
- it allows genuine competition and innovation for the provision of metering and metering services

The approach delivers what the AEMC's Power of Choice hoped, but totally failed, to achieve.

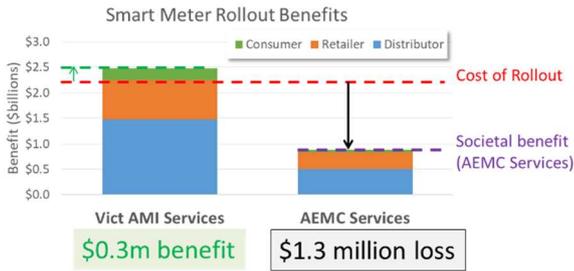
The AEMC smart meter rollout is *expensive*

The majority of smart meter rollouts are justified using economic arguments. The analysis claims services provided by the meters deliver benefits. In all cases the analysis includes numerous small benefits. It is *only* when *all* the small benefits are added together that total benefits outweigh the cost of the rollout.

The AEMC failed to grasp the economic significance of the analysis. Their Power of Choice rollout only mandates four services primarily intended to support retailers (who the AEMC largely allowed to define the requirements). These four services do not support the numerous consumer and distributor benefits typically associated with smart meter rollouts.

The following figure uses the Oakley Greenwood economic analysis of societal benefits delivered by the Victorian Advanced Meter rollout. For comparison the

figure also shows the societal benefits delivered by the four AEMC services.



The analysis shows Victoria’s extended list of meter services delivers an estimated benefit of \$0.3million. If deployed in Victoria the four AEMC services deliver a societal loss of \$1.3million.

Losses are MUCH higher

At all stages Victorian regulators reviewed rollout costs. For example communications costs for one distribution area were deemed inefficient. The regulator only agreed to fund efficient costs forcing the distributor to abandon the high cost solution. Note: communications used to support the AEMC rollout are similar to that assessed as too expensive.

Another example is the published cost to install a Victorian meter was a little over \$50. Inherent inefficiencies in the AEMC smart meter rollout increase this cost to around \$150.

This helps explain why the sale of a business offering AEMC smart meters valued installed smart meters at almost double the published cost of a Victorian AMI meter (\$1570 vs \$880). Applying these figures to the AEMC meter rollout suggests the societal cost of the AEMC rollout is over \$13billion.

The societal cost of the AEMC smart meter rollout is estimated to be \$13billion

A typical response is to add services to the meters hoping to increase delivered societal benefits. The strategy will not work. Smart meters cannot (cost effectively) provide the measurements required to manage a future grid comprising significant levels of consumer installed distributed energy resources.

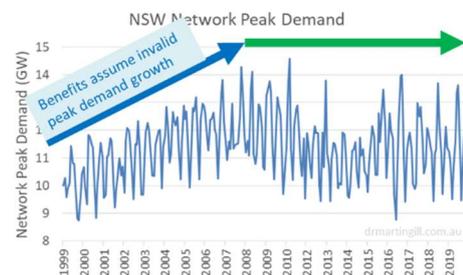
South Australia shows there is a better way. The alternative to mandating an expensive meter based solution is to define the requirement. Such an approach leaves the market free to offer a range of innovative (and cheaper) solutions.

(for completeness) benefits no longer exist

The pace of technology change has invalidated the economic justification for smart meter rollouts. For example one of the major financial benefits of any smart meter rollout is using the data to defer expensive network augmentation. The problem is network peak demand is no longer growing. Without network demand growth network augmentation is no longer required. The benefits no longer exist.

The following figure plots 20 years of NSW monthly maximum peak demand. The figure clearly shows peak demand stopped growing over a decade ago (similar results are obtained in all states).

Since 2008 Network Peak Demand has been flat



A major reason peak demand stopped growing is the huge success of the Government’s Minimum Energy Performance Standards. For example an air-conditioner installed today is 50% more efficient than one installed only a decade ago. Savings from more efficient fridges, TVs, pool pumps and washing machines can be even more significant.

Other overstated benefits include the assumption premises would be immediately de-energised on customer move out. This has not occurred largely due to safety concerns over re-energisation (Not to mention retailer responsibility for restitution for filthy pools when pool filters don’t run, lawns dying due to automatic sprinkler systems shutting down, etc).

Reduce the cost of the AEMC rollout

Alternatively the AEMC could address barriers forcing the use of expensive metering solutions. Starting with a review of the National Electricity Rules to ensure they don’t (unnecessarily) limit permissible metering solutions. For example forcing all meters include a disconnection capability which is not being utilised.

This will prove challenging since the AEMC relies on metering advice provided by AEMO. Recent AEMO advice suggests they will simply choose to continue to ignore innovative metering solutions.

Rewarding Consumers

Consumer engagement in the future energy market depends on offering suitable rewards for consumer participation (both passive and active). For example the ESB's two sided market intends to reward consumers for reducing energy use.

But why limit rewards to energy? Recently the decision was made to mandate domestic inverters provide autonomous grid support via Volt-Watt and Volt-var response modes. Consumer advocates are concerned the modes reduce the value of domestic solar systems but the real issue is consumers receive no compensation for their loss. This is in stark contrast to Traditional Generators who receive (significant) financial benefits for providing the same grid support services to the ancillary services market.

In the USA utilities pay consumers for access to data measured by solar inverters. The current Australian solution is to penalise solar consumers by forcing them to install more expensive metering despite this additional expense providing no consumer benefit.

The AEMC's Power of Choice mandated smart meter rollout promised but failed to offer new consumer services. While the meters make highly invasive measurements of consumer electricity use the AEMC then chose to give consumers no right to control who can access or use consumer data. For example retailers now routinely use the data to identify unprofitable consumers, encouraging them to switch to different retailers and excluding them from cheaper tariffs.

Internationally consumers have been given control of their data. By giving consumers control over their data retailers are encouraged to offer the services the AEMC hoped to enable. For example in exchange for access to solar data a Relevant Agent could offer to monitor the performance of the solar system, immediately reporting performance issues.

The AEMC should consider if forcing consumers to give away their data has contributed to the failure of the Power of Choice to offer new consumer services.

Penalising Consumers

The total failure of the AEMC's Power of Choice to allow consumers to choose more capable metering services forces engaged consumers to install additional metering.

Typically installed at the same time as a new solar/battery system these systems measure solar generation, energy flow to and from the battery, energy use of the house and net energy flow to and from the grid. The historical (and real time) values can then be viewed remotely. Prices for these highly capable metering solutions start from \$200, a fraction of the cost of an AEMC smart meter.

Consumers choosing these more capable metering solutions are then also forced to pay for a far less capable AEMC smart meter. Why?

Conclusion

The smart meter bubble has burst. Smart meters already struggle to provide sufficient information to ensure network security at current levels of consumer installed solar. Concerns about network security will only increase as consumers continue to install more and larger solar systems. The inability of smart meters to (cost effectively) measure installations of battery storage and EV ownership will only add to these concerns. Managing the network stability impacts of the ESB's two sided market are yet to be considered.

It is also important to note the majority of traditional smart meter services are unrelated to customer billing. In almost all cases these non-billing services can be delivered more efficiently and cost effectively by other means. For example most of the solutions offering to turn off consumer installed solar systems in South Australia do not rely on smart meters.

Central to the problem is not the meter, but the antiquated rules governing what meters are considered acceptable. The AEMC is urged to reconsider if highly restrictive meter requirements detailed in the National Electricity Rules should be reviewed.

The AEMC promised their smart meter rollout would allow consumers to choose the metering services they wanted. Instead the Power of Choice has failed to deliver these new services. One reason is the AEMC's refusal to allow consumers to control who can access their meter data. Giving consumers control over their data provides incentives for market participants to offer new services in exchange for access to consumer data.

Appendices

Comments on the NEO

The AEMC uses Australia’s National Energy Objective (NEO) to judge rule changes. The NEO is not a fit and proper tool for assessing smart meter rules.

The AEMC smart meters make 288 measurements of household energy use per day (one measurement every 5 minutes). This is far more than any other smart meter raising significant concerns about consumer privacy. For example analysis of this large amount of data easily reveals when people are at home, the appliances they own and how consumers choose to use them.

A further example of how smart meters invade consumer privacy is the suggestion they can be used to support in home aged care. A smart meter is programmed to check for power changes, e.g. lights being turned on and should it fail to detect typical usage patterns it sends an alert to care providers, who can take further steps to check on the residents.

Dr Gill raised multiple privacy concerns with the AEMC’s Power of Choice metering reforms. In particular he compared the rights given to UK energy consumers to those offered to Australian consumers. For example in the UK consumers have the right to control:

- How much data their smart meter collects, e.g. monthly, daily or half-hourly meter reads
- Whether retailers can share data with other organisations
- Whether retailers can use the data for sales and marketing purposes

None of the data rights offered to UK consumers are offered to Australian consumers

Dr Gill approached the AEMC to discuss a rule change request intended to address the differences. He was advised “the AEMC would reject the rule change”, because “the NEO does not mention consumer privacy”.

Australia’s future energy market will rely on even more invasive measurements and involve a far wider range of market participants including Demand Aggregators, Relevant Agents, etc. This raises even more consumer privacy issues. That the NEO fails to protect consumer interests highlights it is not a fit and proper tool for the AEMC to assess future deployments of highly invasive metering technologies.

The following table is taken from the detailed comparison of consumer rights in the UK and Australian energy markets. The full article is shown to the end of this submission.

Comparing Consumer Rights to control smart meters in the UK against Australia

UK Consumer Rights	Australian Consumer Rights
Can choose if they want a smart meter	Effectively a mandated rollout with no right to refuse a ‘New or Replacement’ meter
Can choose if the meter collects invasive 30 minute measurements of their energy use	No right to refuse collection of highly invasive 5 minute measurements of energy use
Can specify the meter is only to be read daily or monthly	No right to limit how often the meter is read (typically read several times a day)
Can choose to install an In Home Display to help reduce energy costs	AEMC smart meters do not support In Home Displays
Can view detailed usage data, including real time data, on an In Home Display while restricting retailer access to this data	AEMC smart meters are capable of real time measurements but consumers are given no right to control access to this data
Retailers require explicit consumer consent before sharing data with third parties	Australian retail contracts still allow implicit consent allowing retailers to share consumer data
Consumers can specify their data is not to be used for marketing purposes	No restrictions on use of consumer data

The role of Standards

The AEMC claim their rules are 'technology neutral'. This is not the case when discussing metering where technical requirements are detailed in the AEMC's National Electricity Rules (NER).

There are valid reasons for restricting which meters can be installed. Standards test the safety and suitability of meters (e.g. range of temperatures over which they operate) and verify meter accuracy.

Restrictions imposed by the NER become difficult to defend when discussing non-billing quantities, including voltage measurements and energy measurements not used for billing. To support Australia's future energy market the NER should allow flexible low cost solutions, but it doesn't.

The issue is highlighted by new metering requirements introduced in South Australia. AEMO intends to use the separate measurement of solar output to support grid stability. The measurements are *not* used for billing so there is no legal requirement they be made by a NER approved meter. AEMO's advice overlooked more appropriate and cost effective solutions.

As consumers install more distributed energy resources and flexible loads other non-billing quantities become important, including network voltage. While the NER pretends to support this it fails. The NER specifies "average voltage per trading interval". The first issue is the NER fails to specify any testing of the voltage measurements so they are of unknown accuracy or relevance. More fundamentally average voltages are useless for identifying network issues. So technical requirements detailed in the NER risk unnecessarily increasing meter costs for no benefit. Either drop the requirements from the NER or ensure the voltage measurements are tested using suitable Standards.

Unfortunately issues do not stop there. While the AEMC defines a market protocol allowing energy data to be shared, it fails to define a protocol for the sharing of voltage measurements. The AEMC chooses to force distributors to negotiate with multiple Metering Providers active in their area. If they obtain access they then need to negotiate the protocol. This is inefficient and caused by AEMC's failure to understand benefits of standard protocols.

Is the NER still adequate?

The initial trigger for the South Australian state blackout was a voltage disturbance. In response to the voltage disturbance inverters connecting wind generation to the grid shut down. Shutting down the inverters subsequently amplified the initial voltage disturbance triggering a cascade of inverter shut downs. With so much generation forced to shut down the SA grid collapsed.

The AEMO advice to the SA Government was based on an assessment a similar catastrophic failure could occur if a voltage disturbance forced consumer installed solar systems to shut down. AEMO supported the advice with claims they were already seeing voltage disturbances causing cascading domestic solar inverter shut downs.

A traditional approach is to turn the smart meters into Power Quality Analysers. The NER would be amended to refer to appropriate Standards ensuring the measurements are accurate (not useless averages).

Further AEMO research has revealed some inverters can shut down prematurely. Voltage measurements will not detect these premature shut downs. Efficient management involves identifying those inverters which have shut down prematurely. This information is not currently available, but could be.

Inverter requirements are detailed in Australian Standard AS/NZS 4777, including details outlining voltage disturbances levels leading to inverter shut down. A relatively simple modification to this standard might involve adding a requirement inverters store details whenever they shut down due to a voltage disturbance.

The example highlights inadequacies in the NER. While it is not a viable solution the AEMC *can* amend the NER to specify their smart meters make meaningful measurements of network voltage. Despite standards supporting more cost effective management of Australia's energy future the AEMC *cannot* modify these standards (they don't even participate in the process).

New technologies will continue to dramatically change Australia's energy market. Existing regulation, in particular the NER, stifles vitally needed innovation and continues to reward inefficient practices.

Citation

Please accurately attribute all quotes and references to this submission including the title “The AEMC’s Power of Choice does not support future Energy Markets” It would be appreciated if references included the author’s website drmartingill.com.au.

Comments or Questions?

The author is happy to receive comments or questions about this submission. He can be contacted at martin@drmartingill.com.au

About Dr Martin Gill

Dr Martin Gill is an independent consultant specialising in the provision of consumer advice. This advice is based on a deep understanding of the Australian energy industry and strong analytical skills. As a consultant he has prepared advice for consumer advocates, government regulators, electricity distributors, electricity retailers, asset operators and equipment vendors.

Dr Gill is a metering expert. During the National Smart Metering Program he facilitated the development of a specification for Australian smart meters. Innovative metering products developed by his teams have been externally recognised with the Green Globe Award, NSW Government’s Premier’s Award and Best New Product by the Australian Electrical and Electronics Manufacturers Association.

He currently represents the interests of consumers on a range of Standards Australia working groups including metering, renewable power systems, battery storage and demand management.

Comparing Consumer Rights in the AEMC and UK Smart Meter Rollouts

Consumer Privacy (Part 3)

Dr Martin Gill

Governments are increasingly giving consumers the right to control their data. For example the UK energy regulator gives consumer the right to control how, when and even if their smart meter collects data. The Australian energy market mirrors the UK market, so “Why does the AEMC refuse to give Australian consumers similar rights?”

Introduction

The Australian Energy Market Commission’s (AEMC’s) Power of Choice reforms attempt to encourage consumers to participate in the emerging energy market. In the emerging energy market consumers can (attempt to) lower crippling high energy costs.

“The reforms flowing from the AEMC’s Power of Choice review have laid the foundations for an energy system that is positioned to deploy new technologies”

Richard Owens

Despite only a minority of consumers being able to install these new technologies the AEMC’s Power of Choice reforms include rules ensuring in a little over 10 years’ time every Australian home will be required to accept an AEMC smart meter.

In addition to mandating the rollout of smart meters the AEMC then gives Australian consumers absolutely no control over what the smart meter measures and reports.

Despite the UK energy market being virtually identical in design to the Australian market, UK consumers are given the right to control both what their smart meter measures and reports.

Invasive Technology

The application of data science techniques to big data invades consumer privacy. From Patel et al:

Data science techniques can extract a variety of high temporal resolution, household-specific features from the hourly electricity time series.

Traditionally the challenge for data scientists has been attempting to extract specific features from hourly measurements. The AEMC smart meters are required to make 5 minute measurements. Collecting 12 times as much data makes the AEMC smart meters far more invasive than any other smart meter.

Despite the AEMC smart meters being significantly more invasive Australian consumers are not allowed to control the collection of this data.

Summary of Article

The UK and Australian energy markets are remarkably similar. In both markets a smart meter rollout is currently underway. Comparing the consumer rights the UK regulator gives UK consumers to control their smart meter against the total lack of control offered by the AEMC is enlightening:

- UK consumers can choose if they will receive a smart meter. The truth is Australian’s cannot.
- UK consumers can choose if the meter collects invasive interval data measurements. Australian’s cannot control the collection of even more invasive measurements.
- UK consumers can choose how often the smart meter is remotely read. Australian’s cannot.
- UK consumers can choose an In Home Display so only they see their energy consumption (their retailer cannot see the same data). AEMC smart meters do not support In Home Displays.
- UK consumers have to provide explicit consent for their meter data to be shared with third parties. Australian retail contracts still allow implicit consent so consumers can’t control access to their data.

UK and Australian electricity meters are used in exactly the same way. Both markets are deregulated so the meter readings are used to bill consumers. The readings are also used to bill retailers for the electricity they have sold to their customers.

The similarity between the two markets suggests there is nothing preventing consumers being given the same rights. Instead this analysis shows the AEMC chooses to give Australian consumers no rights while the UK regulator gives consumers complete control.

Similarities between the Australian and UK markets

The design of the UK and Australian energy markets is remarkably similar. This is unsurprising because the AEMC largely watches what the UK regulator does and then implements similar rules a few years later. For example when the UK deregulated their market, the AEMC followed. When the UK regulator made retailers responsible for installing consumer smart meters, the AEMC followed.

While the UK regulator gave UK consumers the right to control their smart meter the AEMC did not. The unanswered question is “**Why not?**”

Smart Meter Installation

The first difference between the UK and AEMC smart meter rollouts is UK consumers cannot be forced to accept a smart meter. At all times UK consumers can accept or reject a smart meter.

The AEMC *claims* consumers can choose a smart meter, however this claim is untrue. The AEMC’s rules include conditions forcing consumers to accept the installation of a smart meter.

Under the AEMC rules all new and replacement meters must be smart meters. When an existing meter fails or is deemed to have reached ‘end-of-life’ it will be replaced with an AEMC smart meter (all meters will reach ‘end-of-life’). No consumer choice.

Isn’t mandating the rollout of smart meters at odds with giving consumers the Power of Choice?

Most meters will be replaced before they reach ‘end-of-life’ via the AEMC replacement clause, for example when a consumer installs a solar system or a large air-conditioner or buys an electric-vehicle. In all these cases the AEMC forces them to accept a smart meter.

While the UK regulator gives consumers the right to accept or reject a smart meter the AEMC rules do not give consumers the same right. The AEMC rules ensure all Australian consumers will eventually be forced to install an AEMC smart meter.

Consumer Interval Data

Both the UK and AEMC smart meters are designed to collect large amounts of data revealing exactly how consumers use electricity. The UK smart meters can record electricity use every 30 minutes while the AEMC requires their meters collect this data every 5 minutes. While the AEMC’s 5 minute measurements

reveal far more intimate details about how consumers use electricity this is not the main difference.

The UK regulator gives consumers the right to refuse the collection of this intrusive data. The AEMC does not give Australian consumers the right to control access to this highly invasive data.

Even if the electricity tariff chosen by the Australian consumer does not require the interval data, the AEMC still requires the meter make 5 minute measurements and the retailer collect this data.

If a UK consumer does not want the highly invasive interval data to be collected they can limit the meter to far less invasive daily or even monthly data collection. The AEMC does not offer these options.

Consumer benefits of In Home Displays

Minimal training is required to show consumers how to use an In Home Display to reduce energy costs. The displays also provide environmental benefits through reduced consumption. Recognising these benefits the UK regulator requires all their smart meters be capable of supporting an In Home Display giving all UK consumers access to these benefits.

Relevant to this discussion UK consumers can install an In Home Display while choosing not to allow their retailer access to their interval data. Consumers can still benefit from access to current electricity use and even historical usage data, confident the highly intrusive data is not available to their retailer.

Australian electricity retailers told the AEMC they could deliver a better solution. Instead of offering an In Home Display they would allow consumers to view their electricity use on their smart phone. Mislead by this empty promise the AEMC removed support for In Home Displays from their meters. The AEMC then added a new function raising genuine and significant privacy concerns for Australian consumers.

The reason consumers can use an In Home Display to reduce electricity costs is because it instantaneously shows the cost impact of appliance use. The new function added by the AEMC allows retailers to remotely collect instantaneous measurements of consumer electricity use. The AEMC innocently called this new function “Check Meter Status”.

Potentially “Check Meter Status” could be used to provide a cheap copy of an In Home Display. The retailer remotely reads instantaneous electricity use

and displays it on the customer's smart phone. This misses the point. The AEMC gives consumers no right to control retailer access to measurements even more invasive than interval data collection!

For example: Imagine how much tele-marketers would pay to know exactly what consumers are doing right now. Using "Check Meter Status" retailers could sell this data to tele-marketers so they can predict the best time to call. Most consumers would not see this as a benefit but a major invasion of their privacy.

The above example is a possibility. Data collected using "Check Meter Status" is not interval data. As such it is not protected by existing AEMC rules.

Clarification: Some Australian retailers have offered consumers the ability to view their electricity use on their smart phone. The phone only shows yesterday's electricity use. The 24 hour time delay ensures the consumer educational benefits offered by In Home Displays are lost. Trying to remember which appliances were used 24 hours ago is virtually impossible. The AEMC failed to understand the retailer offered smart phone alternative to an In Home Display does not deliver consumer benefits.

Who gets to see Smart Meter Data?

If the AEMC has its way in the very near future basically anyone can get to see the data collected by AEMC smart meters. The AEMC disagrees with this assessment suggesting their rules govern who can see the data. They conveniently overlook several gaping holes.

Firstly while the AEMC assigned retailers the responsibility for installing consumer smart meters the same rules specify retailers must appoint a third party to manage the meter. At seminars discussing the AEMC smart meter rollout these new meter management companies discuss how selling consumer smart meter data allows them to lower the price of metering (compared to distributor offered meters). To be clear they don't intend to sell the interval data, instead they will sell insights provided by other data, for example using the "Check Meter Status" to indicate when consumers are at home (as discussed above).

Secondly the Consumer Data Right (CDR) will create a massive database storing everyone's smart meter data. The AEMC does not give Australian consumers

the right to refuse collection of their interval data and once collected it will be added to the CDR database.

Once the consumer interval data is in the CDR consumers will be able to give companies access to their data. The Government is assuring consumers they must give permission before any company can access their data, however to streamline the process the permission can be given verbally. The concern is when consumers engage with companies (e.g. a solar installer or electricity retailer) they unwittingly give implicit consent for them to access the data, for example "Do you have some past electricity bills available or can I download the data for you?".

There is another issue with the CDR. The Energy Use Data Model (EDM) provides 'research organisations' with access to consumer data. Consumers are not given the right to control if their data is made available via the EDM.

The UK regulator has addressed all these privacy concerns. Consumers can choose not to have their interval data collected and can control who has access to their data. The UK regulator states

The choices you can make:

- How much data your energy supplier collects from your smart meter, e.g. monthly, daily or half-hourly meter reads
- Whether your supplier shares details about your energy consumption with other organisations
- Whether your supplier can use your meter reads for sales and marketing purposes

The AEMC chooses to offer Australian consumers **none** of the above data rights or options.

Consumers are unaware the data is being collected

The AEMC quietly introduced the collection of highly invasive consumption data in the late 1990's. The late 1990's are best described as the age of 'data innocence'. In the 1990's no one was selling consumer data for the insights it provided. The AEMC is ignoring the dawn of the age of big data mining.

On-going data breaches and scandals are forcing Governments to rethink the level of control consumers are given over all their data. For example Europe's General Data Protection Regulation (GDPR) now requires companies explicitly request consumer consent before collecting their data.

To be clear the UK Government's smart meter rights are not a response to the GDPR. The UK regulator's consumer smart metering rights were published 5 to 6 years before the GDPR (in 2012). The date is significant. The AEMC smart metering rules were published in 2017 revealing the AEMC had 5 years to consider and ultimately reject every single one of the rights the UK regulator gave UK consumers.

It highlights how the AEMC's thinking remains firmly rooted in the 1990's.

- The AEMC has mandated the rollout of smart meters, but does not require retailers inform consumers the smart meter will collect 25,000 times more data than the meter it replaced.
- To support their smart meter rollout they encourage retailers to offer value added services by sharing the consumer's data with third party 'service providers'. The AEMC does not require retailers seek explicit consent before sharing this data.
- The AEMC places no restrictions on retailers using consumer smart meter data for marketing purposes.
- AEMC smart meters can provide significant insights into consumer behaviour. Legislation controlling who can access these insights is woefully inadequate.

Australian consumers require the ability to control access to smart meter data. This starts by giving consumers the right to refuse the installation of a smart meter. It continues by giving Australian consumers the right to control access to the invasive measurements made by the AEMC smart meter.

The UK regulator gives UK consumers the right to control their smart meter so "Why did the AEMC refuse to offer similar consumer rights?"

Conclusion

Consumer confidence in electricity retailers has reached all-time lows. Consumers now rate Australian electricity retailers below door-to-door salespeople and telemarketers. It is therefore unsurprising the AEMC does not advertise their mandated rollout of smart meters gives retailers unrestricted access to, and use of, consumer smart meter data. This is ensured by removing all consumer rights to control or restrict retailer access.

The UK electricity regulator is encouraging the voluntary rollout of smart meters. While the UK and Australian electricity markets are virtually identical comparing the rights of consumers could not be more different. The UK regulator gives consumers the right to choose to accept a smart meter and if they accept they can then control access to the highly invasive measurements made by the smart meter.

The similarities between the Australian and UK electricity markets indicates there is no reason the AEMC could not give Australian consumers the right to control access to their smart meter data. Until they do Australian consumers must accept after the AEMC forces them to install a smart meter, consumers have no right to limit how companies they rate as "not representing the interests of consumers" are then given unrestricted access to, and use of, the highly invasive smart meter data.

Citation

Please accurately attribute all quotes and references to this article including the title "Comparing consumer rights in the UK and AEMC smart meter rollouts". It would be appreciated if references also included the author's website drmartingill.com.au.

Comments or Questions?

The author is happy to receive comments or questions about this article. He can be contacted at martin@drmartingill.com.au

Summary

UK Consumer Rights	Australian Consumer Rights
Can choose if they want a smart meter	Effectively a mandated rollout with no right to refuse a 'New or Replacement' meter
Can choose if the meter collects invasive 30 minute measurements of their energy use	No right to refuse collection of highly invasive 5 minute measurements of energy use
Can specify the meter is only to be read daily or monthly	No right to limit how often the meter is read (typically read several times a day)
Can choose to install an In Home Display to help reduce energy costs	AEMC smart meters do not support In Home Displays
Can view detailed usage data, including real time data, on their In Home Display while restricting retailer access to this data	AEMC smart meters are capable of real time measurements but consumers are given no right to control access to this data
Retailers require explicit consumer consent before sharing data with third parties	Australian retail contracts still allow implicit consent allowing retailers to share consumer data
Consumers can specify their data is not to be used for marketing purposes	No restrictions on use of consumer data

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About Dr Martin Gill

Dr Martin Gill is an independent consultant specialising in the provision of consumer advice. This advice is based on a deep understanding of the Australian energy industry and strong analytical skills. As a consultant he has prepared advice for consumer advocates, government regulators, electricity distributors, electricity retailers, asset operators and equipment vendors.

Dr Gill is a metering expert. During the National Smart Metering Program he facilitated the development of a specification for Australian smart meters. Innovative metering products developed by his teams have been externally recognised with the Green Globe Award, NSW Government's Premier's Award and Best New Product by the Australian Electrical and Electronics Manufacturers Association.

He currently represents the interests of consumers on a range of Standards Australia working groups including metering, renewable power systems, battery storage and demand management.