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14 July 2017

Ms Claire Richards
Project Leader
Australian Energy Market Commission

Distribution Market Model Draft Report

Dear Claire,

Energy Consumers Australia continues to be encouraged by the Commission's technology work program, and in particular the approach taken to the Distribution Market Model.

Consumers are already making their own investments in augmenting the electricity grid. Fifteen percent of households are already equipped with solar energy systems, and this is expected to double over the next five years. Household battery systems are expected to undergo a similar rapid adoption. These distributed energy resources can deliver additional social value if they can respond to signals from the grid.

A well designed and functioning distribution-level market will enable the consumers who have invested to get better returns, and will enable all users of the grid to derive benefit from these investments at the edge of the grid.

In our submission in response to the draft report (attached) we have highlighted the further work that we encourage the Commission to undertake as a consequence of this review. These are:

- Market design for transactions to extract value beyond just energy from DER;
- Information sharing and management including a register of DER assets;
- Network pricing and the incentives applying to networks; and
- The formal consideration of the benefits that might accrue from the establishment of a Standards Development Organisation.

Energy Consumers Australia supports the Commission's view that distribution network service providers should have a constrained role in the development of the distribution market; they need to be facilitators not market makers. However, we are equally concerned that the highly concentrated (oligopolistic) retail sector should not exercise control.

There is a market design task that still needs to be performed by the AEMC and more detailed design options should be developed by as a future work stream.

This market needs to be underpinned by information about the current state of the distribution networks and the location and capability of distributed energy resources. There are a number of activities already under way, including the Energy Council proposal for a storage register. We would welcome the AEMC as part of its market development function ensuring that there are no barriers to the development of the information sharing and management and identify if there is a need for Rule changes to remove impediments or create obligations for the development of a flexible data environment.

The draft report has identified that cost reflective network pricing is a way to ensure that the network value of distributed resources can be realised. The paper has also identified that current regulation undervalues the cost to the network of distributed resources.

Energy Consumers Australia encourages the AEMC to conduct a further review of network economic regulation and price setting to ensure that there are sufficient incentives for networks to facilitate greater participation of distributed resources and that costs are recovered from those who cause them. We do not support a change to the existing rules prohibiting a network from imposing use of system charges for the export of electricity without other changes that facilitate the connection and operation of distributed resources.

Finally, we encourage the Commission to lead a review of whether the energy industry would benefit from the development of its own Standards Development Organisation. We believe that experience in other industries demonstrates that a SDO facilitates more responsive standards development and is appropriate for an industry undergoing rapid technological change.

In our submission, we also note that the first three of these work streams address aspects of the recommendations of the Finkel review of system security.

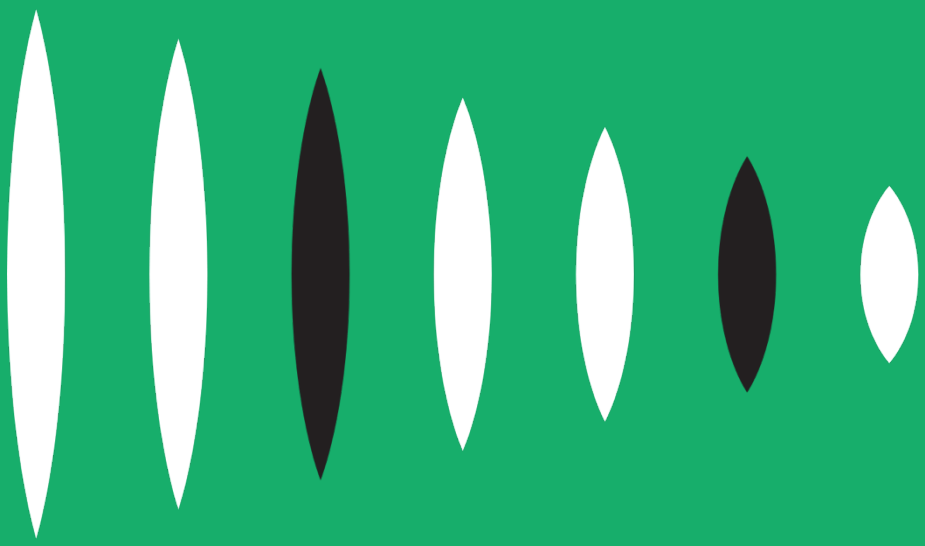
Yours sincerely,

David Havyatt
Senior Economist

Distribution Market Model

Submission to Draft Report

July 2017



ENERGY CONSUMERS AUSTRALIA

Contents

Introduction

In our response to the Australian Energy Commission (AEMC) Approach Paper for the Distribution Market Model (DMM) Review (the Review), Energy Consumers Australia expressed its support for the AEMC's initiative to conduct this review.

The AEMC's Draft Report (the Report) further encourages us with its concise yet comprehensive coverage of the issues in developing the DMM. Energy Consumers Australia takes this opportunity to repeat our proposal in our response to the Approach Paper for the AEMC to identify in its final report the future work that the AEMC will be undertaking.

Energy Consumers Australia anticipates that there will be no immediate rule changes identified in the final report. However, if there are the AEMC should encourage industry, consumers or both together to submit those rule changes as way to expedite necessary reform.

In this submission, we have focused on areas where we see opportunities for the Commission to commit to further targeted reviews in the Final report. In doing so we also identify the areas where this additional review has been recommended by the Finkel Review (Finkel, Moses, Munro, Effeney, & O'Kane, 2017).

The Distribution Market

An already changing network

The distribution market has already experienced fundamental change. since the reforms that separated retail and distribution in the National Electricity Market (the NEM). Initially, the 'transactions' in this market have only been retailers acquiring connection services and the transport of energy over these connections.

The development of Distributed Energy Resources (DER), whether 'smart' as in the AEMC definition or not, has changed this model. Individual households and businesses also acquire connection services and transport energy over the connection. These latter transactions are currently unpriced. While they may be free they are nonetheless transactions; in particular, the DER connection requires the network provider to be notified.

That is, the two-way operation of the distribution network is already occurring, it is not a future state. What is not occurring, as the Report makes clear, is the realisation of all the 'value streams' that are possible from the deployment of DER. 'Value streams' is one of those terms that has been so over utilised that it is in danger of having no meaning; Energy Consumers Australia uses 'value streams' to refer to the excess of benefits over costs of an action or thing.[1]

[1] In 'lean-management' methodology value stream mapping is the internal process for analysing the value chain, which is in turn the linked processes of value creation. Value creation is variously described as a corporate process (generating returns for

There is a related tendency to equate the realisation of value streams with the ability to 'monetise' them; to convert them to a payment. This fails to recognise that there can be value streams created as a side effect of another activity; one can argue that inertia from thermal generation has been such a side effect or spillover. It also fails to recognise that the value can be provided in terms of something other than dollar value, such as security or safety.

Energy Consumers Australia's solar experience and battery readiness research provides evidence that consumers are prepared to purchase DER simply to provide grid independence to pay back the energy system for the way they are being treated. One can argue that consumers are getting value by 'sticking it to the man.'

The Report notes the multiple value streams that can flow from the operation of DER may be in conflict. For example, a consumer with a fully charged battery may value using it to power their load now because they know they will shortly be able to recharge it, while the network operator or overall market might prefer the consumer to be consuming from the grid now. Such a situation may come down to something as simple as a time shift, simply delaying by one hour the self consumption.

This creates a complex operating environment. Consumers are becoming 'co-investors' in the 'Grid.' They want to get value for their investment, but will increasingly want to know they are getting the most value that they can from their investment. This potentially intersects with consumer protections in new energy services and ensuring that consumers are accurately informed by vendors.

The consumer protection requirement is outside the scope of this review but will need to develop alongside the developments of the distribution market. The transactions in the wholesale market are underpinned by prudential regulations to ensure that participants can fulfill their obligations. It is reasonable to expect that similar prudential regulations may prove to be necessary in the distribution market.

Optimising the new network

The co-ordination and optimisation required in the DMM is non-trivial, and it is likely to be an information rich market.

The Report refers to the optimisation function as if it is a value stream in its own right, writing:

> *Optimisation is therefore likely to become increasingly valuable and important as the number of distributed energy resources installed increases…*
>
> *A workably competitive market will determine whether this optimising function is most efficiently achieved by multiple parties or by one party across a particular geographic region (which may or may not be a current distribution network), or indeed via multiple*

shareholders) or for consumers (the extent to which the customer benefit exceeds how much they have to pay – analogous to consumer surplus).

> *parties responding to an 'invisible hand'. This report does not express a preference for any particular outcome, but rather seeks to promote the development of a competitive market for the provision of services enabled by distributed energy resources so that markets, in response to consumer decision-making, can determine the most efficient outcome.* (Report: P. 19)

Energy Consumers Australia accepts the premise, but notes the argument is potentially circular. For the distribution market to operate it needs to have some market design, which is usually determined either by a regulator or by industry agreement. This design will determine if the market is workably competitive, and that in turn will determine how the optimisation function is performed.

As noted above the market needs to recognise that not all transactions will be monetized, for example, Energy Consumers Australia has identified consumers expressing a desire to donate their excess energy to a good cause. An effective design needs to allow consumers preferences to be communicated and responded to.

That is, the process starts with some market design decision which will determine whether optimisation occurs effectively or not. As an example, the optimisation in the NEM wholesale market occurs through the operation of AEMO's rules.

It is valid to question whether AEMO merely discounting bid prices to allow for transmission losses is sufficient in determining merit order, or whether generators should incur the full cost of transmission not just the transmission losses. (Transmission losses are considered for the need to balance supply and demand whereas including the transmission costs impacts the price).

Similarly, the market design operates by creating a 'clearing price' at which all demand is met and in which all participants receive the clearing price is a market design. This is a market that could implement first order price discrimination by consumers rather than producers. The market operator has been told each firm's reservation price and could both dispatch and settle at that price.[2]

This would, of course, require totally different bidding strategies for generators. Energy Consumers Australia has not undertaken any further theoretical analysis, modelling or simulation of such a market but the idea that all the surplus is captured by consumers has attraction. We also believe that a change to settlement could impact the economics of storage.

We are not advocating any change, just using these examples from the wholesale market to demonstrate cases of alternative, feasible market designs.

The Commission has drawn the conclusion that:

> *Allowing regulated DNSPs to take on a role in optimising investment in and operation of distributed energy resources would not provide a*

[2] We note that the Energy Council is now considering whether the market should be changed in this way.

> *level playing field for market participants. The DNSP…will have the ability to exert control over the distributed energy resources and foreclose access.* (Report, P:35)

Energy Consumers Australia agrees with this conclusion. However, the principle should be extended to recognise that any party with market power has the same ability to exert control over DER.

The retailers known as the 'Big 3' have sufficient market power individually, and collectively through unorganized collective action. (By this we mean that the aligned incentives of the Big 3 can result in them behaving in a consistent way, not that they are colluding in any way.)

The role of the DNSP

Information sharing and management

While Energy Consumers Australia agrees with the AEMC that DNSPs should not be the 'market maker' for the DMM, the DNSPs are important facilitators. All the transactions in the DMM involve power flows in the distribution network. DNSPs are also a potential beneficiary of DER in peak load management, but as the Report notes they are not the only potential supply side beneficiary.

The Report makes the following observations:

> *[The NEM] decentralised operational and investment decisions in generation to commercial parties who have stronger incentives to make efficient decisions and are better placed to manage the risks of those decisions. (P.21)*

> *The complex task of optimising investment and operational decisions is best handled through disaggregated decision making in the market. (P.23)*

> *Stronger coordination relies on all relevant parties having sufficient information available to them and for this information to be reflected in price signals that reflect the value of providing all possible services… (P.24)*

> *The Commission considers that consumer choices should continue to drive the development of the energy sector, but that market design and regulatory frameworks may need to be modified to better align individual decisions with the long-term interests of consumers more generally. For example, to the extent that consumers make decisions regarding distributed energy resources that impose costs on others, those costs should be signalled to the consumer so that the costs can be internalised and incorporated in the consumer's decision-making. (P. 25)*

These observations all entail a role for networks in information sharing and management. The coordination of the investment in, and operation and use of, DER depends on information about the current operation of the network.

While some of this data is becoming available in aggregate (for example, identifying areas of network constraint) much more detailed data is required for the operation of DER. This includes information about the network and information about the location and capability of DER.

The issue of the recording of the location and characteristics of DER is equally important. The COAG Energy Council is currently considering a proposal for AEMO to maintain a storage register. The Report identifies that network connection rules currently require details of (some) DER to be provided to DNSPs.

Energy Consumers Australia believes that trying to decide between these two as storage locations is a false dichotomy. Both need the data. The issue is how the data is captured and shared.

The dividing lines between distribution businesses in individual states are accidents of history, as is the dividing line between states. The lowest regulatory cost will be incurred by an efficient nationally consistent process that utilises modern technology. Device registration by nationally standard phone app that can read barcodes on devices and take photographs of installations is a low cost solution.

The default position should be for AEMO to develop the registration database and procedure, partnering with, and drawing on the capability of, DNSPs.

Network incentives

The Report also notes that “better, upfront awareness of the localised characteristics and capabilities of its network helps a DNSP to proactively manage issues as they arise” and “investment in new equipment and smart IT/communications infrastructure is likely to be needed to support this level of data collection. The costs of such an investment may be significant if the DNSP seeks a lot of granular data, in real time, at a number of locations across its network.” (P. 43)

Energy Consumers Australia agrees with this observation. It poses the question, however, why after a decade of talking about ‘smart grids’ the grid still isn’t smart.

The answer lies in incentives. There is little incentive for networks to make these investments; networks also assert that there has been little appetite for allowing these capital investments in revenue determinations.

The AEMC also notes the presumed ‘prioritisation’ of DNSPs for capital expenditure over operational expenditure. (P.38) This has not resulted in a preference for investment in IT to better manage networks, possibly because of the much shorter asset life of these investments.

Resolving the incentives for networks to invest in IT therefore cannot be divorced from the detail of the economic regulation framework.

Network Pricing

Energy Consumers Australia notes the AEMC concern about the implementation of cost reflective network pricing. We also note the AEMC's consideration of the possibility of imposing charges on DER for the use of the network.

Any move to change the charging for DER needs to be considered in conjunction with a discussion of the overall construction of cost reflective prices.

The issues of network pricing are extensive and are framed by expectations of 'cost reflective pricing.' While the Rules call for prices to be based on long run marginal costs, the implementation has been modelled on a very small subset of marginal investments.

The current interpretation of the 'cost reflective' component of pricing is that it should reflect forward looking costs only. The Rule Determination discussed alternative methodologies, but did not conclude that one should be incorporated in the rule. The Average Incremental Cost methodology was one of those considered, and is the easiest to calculate. As a consequence, the implementation by DNSPs has relied on the Average Incremental Cost (AIC) methodology, even though the Determination noted:

> *The AIC methodology will underestimate the LRMC in constrained parts of the network and overestimate the LRMC in those parts of the network where there is excess capacity. As noted by NERA, these are precisely the opposite signals that should be sent to encourage efficient consumption and investment decisions. (AEMC, 2014, p. 127)*

The concept of basing cost reflective prices on AIC is problematic. The AIC methodology starts by estimating expected future demand and the incremental costs of servicing this demand. Once these estimates are conducted the cost reflective price (implemented as a price on peak usage) is determined.

Even if we assumed locational pricing, there is a problem with this approach.

If cost reflective pricing is effective in modifying behaviour, then the implementation of the cost reflective price would reduce the forecast demand and reduce the required capital expenditure. At the next regulatory reset the forecast is now based on this changed behaviour, and so there is no longer a forecast demand increase, and so the cost reflective price signal is reduced. But then demand will increase again.

If cost reflective pricing is ineffective, then the network investment will occur, but because investment is 'lumpy' the network will have excess capacity and there will not be further investment requirement at the next regulatory reset. So, in the next period the consumers who caused the investment need will be relieved of the cost reflective pricing component.

These difficulties are easiest to see in the AIC methodology, but they are derived from the idea that cost reflective pricing should only be forward looking. There is an inherent contradiction in assuming that the methodology of pricing should be based on a different concept than the methodology of revenue determination. The latter is primarily driven by recovery of sunk costs, and it is reasonable to price on the basis of which consumers those sunk costs serve.

An alternative construction of cost reflective pricing using this approach would be based on a Total Service Long Run Incremental Cost (TSLRIC) basis. For simplicity assume a network only servicing residential and small business customers. Such a network is providing four identifiable 'services.'

The first service is the original function of our electricity system, public service electricity such as street lighting, but including traffic lights and now NBN nodes. The first long run cost estimate is the total cost of supplying a network that did just those functions and no more. That would include fewer poles, less transformers, less medium voltage transmission.

The second layer of costs is the additional (incremental) cost of providing the same network with connections to each house but no power. To devise the incremental cost you model this network and subtract the cost of the first network.

The third cost layer is what it would cost to provide the network if it carried the average load all the time. Once again the increment is how much this costs less the cost of the second layer.

The final layer is what it costs to run the network providing for peak demand. The incremental cost is derived in the same way. This final layer includes costs that are incurred beyond immediate capacity requirements because of lumpiness.

In the best of all possible worlds, costs of the first type would be recovered through taxation, and as land tax is both efficient and relevant to the service, land tax (rates) would be appropriate.

The second cost layer would be recovered in the daily supply charge. If the first cost layer can't be recovered otherwise, then it also should also be recovered in the daily supply charge.

The third layer should be recovered on the basis of energy consumed since that is the determinant of the cost base. The final costs should be recovered in the demand charges.

Such an approach is not only more cost reflective, but it also provides a charging basis in which two way flows could be charged.

Energy Consumers Australia has not modelled this alternative approach to understand its implications for both networks and consumers. It does, however, appear to have benefits over the approach currently pursued by networks that sees rapidly increasing daily supply charges which merely work as an incentive for grid defection and the so-called 'death spiral.'

Energy Consumers Australia does not wish to comment further on the detail of question 1 to 4 in the draft. Our position is that a review of cost reflective pricing and the appropriate arrangements for charging DER should be the subject of a further review arising from the Distribution Market Model work.

In proposing this further review, we note that the discussion to date of cost reflective pricing has been too focused on supply-side push rather than demand-side pull. The supply-side focus has resulted in an under appreciation of the behavioural determinants of consumer decision making, and on an inadequate recognition of the function of retailers in combining various cost streams into a final electricity price.

Standards

Standards play an important economic function. Effective standards facilitate the development of markets by reducing the information requirements associated with transactions – the consumer knows what they are getting.

However, standards can also be effective tools for protecting markets from competitors. If the standards setting process can be controlled by incumbents, then they can be used very effectively to restrict entry.

The standards developed by Standards Australia (SA) have no legal impact of their own. SA simply facilitates the development of internationally harmonised Standards and other solutions that make a positive contribution to Australia. These standards are then often incorporated by reference into legislative instruments or by reference in contracts.

The National Electricity Market arrangements do not, as far as Energy Consumers Australia is aware, incorporate any Australian Standards[3]. The process of creating or amending Australian Standards is restricted by the availability of project resources. Yet standards could be crucial to the development of the Distribution Market Model.

In recognition of the important role that standards can play, and the reasonable requirements an industry might have to control its own standards, it is possible for an industry to establish an accredited Standards Development Organisation (SDO). As the Standards Australia website notes:

> *Although Standards Australia has a long history of developing voluntary Australian Standards, it is recognised that becoming an accredited Standards Development Organisation could be a suitable path for some other groups depending on the particular circumstances or environment within that industry or sector.*[4]

There are currently five accredited Standards Development Organisations:

[3] Though Australian Standards are possibly referred to in jurisdictional and safety regulations.
[4] See http://www.standards.org.au/StandardsDevelopment/accreditation/Pages/default.aspx

- Australian Forestry Standard Limited (AFSL)
- Communications Alliance (CA)
- Fisheries Research and Development Corporation (FRDC)
- Pharmacy Guild of Australia (PGA)
- Rail Industry Safety and Standards Board (RISSB)

It is notable that two of these SDOs are in fields like electricity where formerly government owned entities that specified the regulatory structures have been subject to market reforms.

Energy Consumers Australia notes that there has been recent adverse commentary about proposed battery installation standards.[5] Similar tensions can emerge in relation to all the relevant standards.

As the market developer, the AEMC should initiate its own inquiry into the use of standards in the development of markets and the desirability or otherwise in establishing an accredited SDO for the energy sector.

Implications of the Finkel Review

The review into electricity security and reliability led by Dr Finkel has made four recommendations that relate to the DMM work (Finkel, Moses, Munro, Effeney, & O'Kane, 2017)

Participation of DER in security market

Recommendation 2.5

By mid-2018, the COAG Energy Council should direct the Australian Energy Market Commission to review the regulatory framework for power system security in respect of distributed energy resources participation.

By mid-2019, the Australian Energy Market Commission should report to the COAG Energy Council on proposed draft rule changes to better incentivise and orchestrate distributed energy resource participation to provide services such as frequency and voltage control.

The Finkel Review's recommendations for increased security mostly focused on the changes required to maintain system security while incorporating large scale renewable generation in the grid. However this recommendation focused on the role that DER can play in providing system security. That is, the value streams that DER can provide to the grid overall.

This is the core of the 'optimisation' function that the Paper has identified. As discussed above this requires a market design to support the use of DER – or to 'incentivise and orchestrate' them.

The AEMC does not need to wait to be tasked with this function by the EC, it can undertake the review as a continuation of this review.

[5] See for example http://reneweconomy.com.au/standards-australia-renews-threat-of-home-battery-storage-ban-43719/

DER register

Recommendation 2.6

The COAG Energy Council, in addition to its project on energy storage systems, should develop a data collection framework (or other mechanism) to provide static and real-time data for all forms of distributed energy resources at a suitable level of aggregation. The project should be completed by mid-2018.

The EC has already consulted on the development of a storage register to be maintained by AEMO. The Finkel Review has recommended that this should be extended to all forms of distributed energy resources.

Whether that data collection framework results in data being stored by and accessible from AEMO or DNSPs, creating a single nationally consistent framework can be facilitated by the AEMC and may ultimately require rules changes.

The AEMC and AEMO can jointly sponsor and support the analysis of the options for this framework. As networks, through the ENA Network Transformation Roadmap, have also recognised this need they can be partners in this project.

Data requirements

Recommendation 7.14

By end-2018, the Energy Security Board, in collaboration with the Australian Energy Regulator, should develop a data strategy for the National Electricity Market.

- *The initial design of the data strategy must be developed in consultation with industry bodies and consumer bodies, and be consistent with open government data principles.*
- *The Energy Security Board must report to the COAG Energy Council on the completion of the first stage. This should include costs for design and implementation for initial set up, plus indicative costs for ongoing maintenance of the key deliverables under the data strategy.*
- *The first phase of the data strategy must be completed by end-2017, with the functionality of the components of the strategy reviewed annually to ensure that they continue to be fit-for-purpose.*

The Paper has identified the need for the overall data strategy. Progressing that strategy, like the register, needs to be conducted with the other market bodies and industry. Once again, the AEMC should not wait to be tasked by the EC to initiate this project.

Network incentives

Recommendation 6.8

By mid-2018, the COAG Energy Council or the Australian Energy Market Commission should commission financial modelling of the incentives for

investments by distribution network businesses, to test if there is a preference for capital investments in network assets over operational expenditure on demand-side measures.

If this work demonstrates that there is a bias towards capital expenditure, the COAG Energy Council should direct the Australian Energy Market Commission to assess alternative models for network incentives and revenue-setting, including a total expenditure approach. This should be completed by end-2019.

The Finkel Review has acknowledged concern that current economic regulation may not provide incentives for networks to invest in the necessary systems to optimize DER or may have incentives to favour capital expenditure in new network assets rather than paying DER owners for services to mitigate the need for additional network investment.

The Department of Environment and Energy (Cth) has issued a request for tender (RFT Number: 2000002144) on behalf of the Energy Market Transformation Team. The RFT states that the EMTPT "seeks to explore alternative regulatory frameworks, or approaches under the existing framework, that may improve electricity network efficiency and investment incentives into the future." This work would appear to fulfill the suggested commissioned financial modelling, however, it is the second limb of the Finkel recommendation that is most critical.

The AEMC has also already been tasked with reviewing the economic regulatory framework, and the report is due to be released on 18 July.

The AEMC has the opportunity to move immediately to a review alternative models of economic regulation to address the incentives issue. Energy Consumers Australia believes a focus on the question of 'totex' is an inadequate approach. The review can include both revenue determination and price structures.

Conclusion

Energy Consumers Australia supports the work of the AEMC in its technology review program. As stated in the introduction we encourage the AEMC in its final report to identify the additional work that will be undertaken.

In our discussion of the report we have identified the following areas for additional work:

- Market design for transactions to extract value beyond just energy from DER
- Information sharing and management including a register of DER assets
- Network pricing and the incentives applying to networks
- The formal consideration of the benefits that might accrue from the establishment of a Standards Development Organisation

The first three of these areas have also been identified by the Finkel Review.

Energy Consumers Australia encourages the Commission in its Final Report to establish all these further workstreams so that the full benefit of DER can be realised in the National Electricity Market.

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