Australian Energy Market Commission

RULE CHANGE

DRAFT RULE DETERMINATION

National Electricity Amendment (Register of distributed energy resources) Rule 2018

Rule Proponent(s)
COAG Energy Council

26 June 2018

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AEMC, *Register of distributed energy resources*, Draft determination, 26 June 2018, Sydney.

About the AEMC

The AEMC reports to the Council of Australian Governments (COAG) through the COAG Energy Council. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the COAG Energy Council.

Summary

The Australian Energy Market Commission (AEMC or Commission) has made a draft rule that amends the National Electricity Rules to establish a process by which the Australian Energy Market Operator (AEMO), network service providers (NSPs) and other interested stakeholders may obtain static data on distributed energy resources (DER) across the national electricity market.

This information will be held in a register to be established, maintained and updated by AEMO, and access to it will give networks and AEMO visibility of where DER is connected so they can plan and operate the power system more efficiently.

The draft rule was made in relation to a rule change request submitted by the COAG Energy Council that aimed to improve the collection and sharing of information about small scale behind the meter DER in the national electricity market (NEM).

Background and rationale

Prior to submitting the rule change request, the COAG Energy Council conducted consultation on a national register of small scale battery storage systems. The *Independent Review into the Future Security of the National Electricity Market* ('the Finkel Review') also recommended a data collection framework be developed for DER.

The energy sector is undergoing a major transition driven in part by the increasing uptake of DER by consumers and businesses. These systems provide opportunities to manage the power system in new ways, particularly with advanced metering and remote control.

In this context, there is an emerging need for network service providers and AEMO to have greater visibility over DER as their aggregate impact on the power system grows. The need to manage the risks brought about by the uptake of these new technologies led the COAG Energy Council to submit the rule change request.

Features of the draft rule

The Commission has made a draft rule consistent with the rule change request. The draft rule:

- places an obligation on AEMO to establish, maintain and update a register of static data for DER devices in the NEM
- requires NSPs to request from their customers the specific DER information outlined by AEMO in guidelines (through the network connection process and deemed standard connection contract) and provide this to AEMO
- places an obligation on AEMO to develop, maintain and publish DER register information guidelines that specify, amongst other things, the details of the information that NSPs must provide to AEMO, as well as when and how the information is to be provided

- requires NSPs to provide AEMO with their known information about existing DER within their network as required in the guidelines (and to the extent they hold this information) as part of the first reporting cycle after the guidelines commence

- introduces a data sharing framework that obliges AEMO to share disaggregated data regarding the locational and technical characteristics of devices in the DER register with network businesses in relation to their network areas, subject to privacy laws and protected information provisions in the National Electricity Law (NEL)

- places an obligation on AEMO to periodically report publicly relevant information from the DER register at an appropriate level of aggregation

- places an obligation on AEMO to publish details, no less than annually, on its use of the DER information received under this rule

- allows AEMO to provide DER register information to an emergency services agency if requested for the purposes of that agency's response to an emergency or for planning in relation to emergency responses.

Benefits of the draft rule

Having regard to the issues raised in the rule change request, the Commission is satisfied that the draft rule is likely to contribute to the achievement of the National Electricity Objective by affording the following benefits:

- Promoting better investment decisions: the introduction of a DER register will assist NSPs with network planning by affording them improved visibility over the DER installed on their networks. Increasing visibility of DER should result in a more efficient, less conservative approach to asset investment.

- Improving operation of the power system: improved visibility over DER should facilitate improvements in the quality of AEMO's load forecasting and modelling. AEMO should also be able to improve its operational processes by being able to access information on certain technical characteristics of DER devices, such as trip settings. In addition, increased visibility should assist NSPs with network operation through increasing the capability of their networks by assisting with optimising distribution network load shedding and forecasting future potential quality of supply issues.

- Sharing information with third parties: periodic reporting by AEMO of DER register information on an aggregated basis may be of benefit to bodies such as to policy-makers, researchers, consultants and other market participants or investors.

Design considerations

While there will be benefits in NSPs and AEMO, in particular, having access to static data on DER, these benefits are likely to be incremental and commensurate to the nature of the information collected. The design of the DER register has therefore been formulated to avoid significant cost outlays by AEMO or other Registered Participants, by avoiding duplicating existing data or introducing new reporting obligations on market participants.

Where possible, the Commission has leveraged existing mechanisms under the National Electricity Rules (NER) for the collection of data by NSPs. While the Commission notes concerns raised by stakeholders regarding the effectiveness of these mechanisms, making use of existing processes to collect data for the register will be more cost efficient than other alternatives, and will create an opportunity for NSPs to work with installers and customers in their network area to improve compliance with existing data submission requirements.

The Commission is of the view that establishing a DER register in the NER will provide a basis for other entities (such as jurisdictional regulators, as well as industry bodies) to require or encourage submission of the appropriate data to NSPs by installers on behalf of customers. In that sense, the Commission recommends that state safety regulators investigate how existing compliance mechanisms could be used to improve submission of appropriate data on DER to NSPs (e.g. whether it is appropriate to amend the data collected under electrical safety certificates for use by NSPs).

Related work programs

This rule change is part of a broader package of initiatives in the energy sector to enable more efficient operation of energy markets in light of ongoing changes in technology and consumer preferences. The Commission has therefore taken into account the interactions between this rule change and other projects being undertaken by the Commission and other industry parties.

Improved information on the static characteristics of DER devices through the register will represent a first step towards increasing system visibility over DER. Issues associated with the further integration of DER in the NEM are the subject of a number of other processes, including a consultation paper on *Open Energy Networks* jointly published by Energy Networks Australia and AEMO on 15 June 2018, and the Commission's *2018 Economic Regulatory Framework Review*, which is assessing the role of electricity distribution networks in optimising the value provided by DER.

The DER register also forms part of a broader work program to unlock the value of data to empower consumers and, as such, will contribute to the NEM data strategy currently being developed by the Energy Security Board.

Consultation

The Commission welcomes submissions on this draft determination and the draft rule by **7 August 2018**.

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1 COAG Energy Council's rule change request

1.1 The rule change request

On 5 October 2017, the Council of Australian Governments Energy Council (COAG Energy Council) made a request to the Australian Energy Market Commission (AEMC or Commission) seeking to improve the collection and sharing of information about small scale behind the meter distributed energy resources (DER) in the national electricity market (NEM). This would be done through establishing a DER register to be managed by the Australian Energy Market Operator (AEMO).

According to the proponent, the primary objectives of the register are to improve power system and network security and operation, through the provision of better information on behind the meter DER.

The COAG Energy Council did not propose specific changes to the rules or include drafting for a proposed rule. Instead, it highlighted aspects of the current regulatory framework which may require changes, and proposed potential solutions in general terms.

1.2 Rationale for the rule change request

According to the COAG Energy Council, as installations of behind the meter batteries and other distributed energy resources are set to increase in the coming years, system management challenges for AEMO and distributors and safety risks could also increase if information gaps about these installations are not addressed.

The COAG Energy Council noted Bloomberg New Energy Finance projections that 100,000 batteries could be installed by 2020, and one million by 2030.[1]

The rule change request cites three main problems that could occur if current information gaps relating to small scale batteries were to continue:[2]

- **Inefficient market and network investment** - due to overstated or understated demand forecasts that have not accounted for behind the meter battery storage.
- **Inefficient market and network operation** - the market operator and distributors may not be able to develop reasonable estimates of short term demand, making system control more difficult and expensive leading to inefficient networks and market operation.

1 Bloomberg New Energy Finance, February 2017, cited in the rule change request, p. 3.

2 COAG Energy Council, *Register of distributed energy resources*, rule change request (rule change request), October 2017, p. 6.

- **Safety risks to workers, installers and the general public** - due to emergency services and line workers or electricians not having adequate information on sites with a battery or other DER.

The COAG Energy Council noted AEMO's *Visibility of Distributed Energy Resources* report,[3] which indicated that, in aggregate, DER could have a material and unpredictable impact on the power system unless information about deployments are available, making it more difficult for AEMO to undertake forecasting and manage the power system.[4]

1.3 Solution proposed in the rule change request

Bearing in mind its objectives, the COAG Energy Council described its proposed solution as involving the following broad changes:[5]

- requiring AEMO to administer a register of DER
- establishing principles in the National Electricity Rules (NER) broadly defining how AEMO should determine the types and capacity of DER that should be included in the register, and allowing AEMO to use a guideline to specify the DER systems and data that should be collected
- establishing requirements in the NER that AEMO must follow to develop, maintain, publish and amend a guideline outlining the specific DER types to be included in the register and the required data sets
- allowing AEMO to share information in the register with appropriate parties, where there are recognised benefits for consumers in doing so, subject to applicable privacy laws
- requiring distribution network service providers (DNSPs) to collect information about DER connected to their network, and provide this information to AEMO
- defining mechanisms or obligations on different parties to support the collection of information about DER at customer sites.

The COAG Energy Council indicated that the type of information envisaged to be collected could include a DER system's location, installation and decommissioning date, the system's capacity and technical characteristics (such as manufacturer, make, model number and inverter settings such as frequency and voltage trip settings).[6]

3 AEMO, *Visibility of Distributed Energy Resources*, January 2017.

4 Rule change request, p. 4.

5 Rule change request, p. 1.

6 Rule change request, p. 2.

1.4 Relevant background

At its December 2015 meeting, the COAG Energy Council endorsed a work program to be progressed by its Energy Market Transformation Project Team (EMTPT) aimed at ensuring that the energy market is receptive to new technologies.

COAG Energy Storage Registration Consultation Paper

In August 2016, the EMTPT launched a consultation process on the merits of establishing a national register of small scale battery storage systems.[7]

The consultation paper considered that the take-up of DER would increase and that a register of DER may:

- improve power system and network security – this is because expected take-up of DER by consumers will reduce the amount of generation over which AEMO has visibility and control to operationally manage the power system
- be useful for emergency response purposes, given the potential for fire or explosions with DER technology – when emergency response teams are called to respond to an incident, the EMTPT noted that a register could potentially inform them of the location and chemistry type of both grid-connected and off-grid storage devices
- promote industry integrity by helping consumers, line workers and installers obtain critical information before conducting activities related to battery storage.[8]

Of the 25 submissions received through the consultation process, more than half agreed that the register should be established. There was broad agreement that the data should be collected by DNSPs or energy storage installers, and that the register should be administered by a national government agency.[9]

There were some concerns expressed about whether the costs of developing and maintaining a register would outweigh the benefits. Energy retailers, in particular, were concerned that a register might add unneeded regulatory burden to an emerging industry.[10] There were also several concerns expressed about consumer privacy, with several stakeholders advocating that consumers should at minimum have a right to access and correct their own information.[11]

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7 Energy Market Transformation Project Team, *Energy Storage Registration*, Consultation Paper, 19 August 2016.

8 EMTPT, *Energy Storage Registration*, Consultation Paper, 19 August 2016.

9 Submissions to the EMTPT consultation paper: Ausgrid p. 1; ANU Energy Change Institute, pp. 3-4; Clean Energy Council, pp. 7-8; Endeavour Energy, p. 1; Energy Consumers Australia, p. 7, Energy Networks Australia, p. 3; Ethnic Communities' Council of NSW, p. 3; K&W Mallesons, p. 9.

10 Submissions to the EMTPT consultation paper: AGL, p. 1; Climateworks, p. 1; Origin energy, p. 3.

11 Submissions to the EMTPT consultation paper: AESA, p. 2; Electrical Trades Union of Australia, p. 2; Dr Penelope Crossley, p. 15; Public Interest Advocacy Centre, p. 2.

Cost benefit analysis

At its 14 December 2016 meeting, the COAG Energy Council agreed in principle to develop a national battery storage register subject to the outcome of a cost benefit analysis (CBA).[12] The EMTPT subsequently commissioned Jacobs in March 2017 to develop this analysis, with the COAG Energy Council endorsing the final CBA report for public release in July 2017.[13]

Jacobs' CBA compared a register hosted by AEMO or, alternatively, the Clean Energy Regulator (CER) with a base case scenario of no register.[14]

The results of the CBA showed a positive benefit-cost ratio for a register hosted by either AEMO or the CER. In particular, Jacobs found the net present value (NPV) of Option 1 (AEMO) to be $15.1m, and of Option 2 (CER) to be $13.3m. The difference in value between the two options was predominantly due to the collection costs being lower for Option 1, as data was assumed to be collected using a new app. If the same data collection improvements were applied to both models, Jacob's concluded that Option 2 would have the higher NPV.

Finkel recommendation[15]

The *Independent Review into the Future Security of the National Electricity Market ("the Finkel review")*[16] final report was released on 9 June 2017 and outlined 50 key recommendations to reform the energy market. One of these recommendations, Recommendation 2.6, called for the COAG Energy Council to implement a record of static and real-time DER:

> "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."

In line with this recommendation, on 14 July 2017 the COAG Energy Council agreed to initiate the development of a national register for DER (including solar generation and batteries), acknowledging the first step would be the drafting of a rule change

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12 Energy Market Transformation Project Team, *Energy Market Transformation Bulletin No 04 - National Battery Storage Register Consultation*, 22 May 2017.

13 COAG Energy Council, *Register of distributed energy resources*, rule change request, October 2017, p. 6.

14 The base case was that: (1) There would be no further investment in a national register; (2) AEMO would continue pursuing and eventually installing a separate real time database; and (3) Distributors would continue to enhance and develop their own databases, but because of data collection issues would only collect around 30% of new storage installations.

15 Dr Alan Finkel, *Independent Review into the Future Security of the National Electricity Market*, final report, June 2017, p. 22.

16 This review was chaired by Australia's Chief Scientist Dr Alan Finkel AO. The other panel members were Karen Moses, Chloe Munro, Terry Effeney and Professor Mary O'Kane.

proposal.[17] The COAG Energy Council subsequently lodged the rule change request on 5 October 2017.

1.5 The rule making process

On 6 March 2018, the Commission published a notice advising of its commencement of the rule making process and consultation in respect of the rule change request.[18] A consultation paper identifying specific issues for consultation was also published. Submissions closed on 17 April 2018.

The Commission received 25 submissions as part of the first round of consultation. The Commission considered all issues raised by stakeholders in submissions. Issues raised in submissions are discussed and responded to throughout this draft rule determination. Issues that are not addressed in the body of this document are set out and addressed in Appendix A

1.6 Consultation on draft rule determination

The Commission invites submissions on this draft rule determination, including a draft rule, by **7 August 2018**. There will be limited capacity to accommodate late submissions.

Any person or body may request that the Commission hold a hearing in relation to the draft rule determination. Any request for a hearing must be made in writing and must be received by the Commission no later than 3 July 2018.

Submissions and requests for a hearing should quote project number **ERC0227/RRC0011** and may be lodged online at www.aemc.gov.au or by mail to:

Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

17 COAG Energy Council, *Meeting Communique*, 14 July 2017, Canberra.

18 This notice was published under s. 95 of the National Electricity Law (NEL) and s. 251 of the National Energy Retail Law (NERL).

2 Draft rule determination

2.1 The Commission's draft rule determination

The Commission's draft rule determination is to make a draft rule. The draft rule establishes a register of distributed energy resources to be managed by AEMO, with information to be collected by NSPs to provide AEMO and NSPs greater visibility and consequently improve their ability to manage power system security, planning and forecasting, and operation.

The Commission's reasons for making this draft rule are set out in section 2.4.

This chapter outlines:

- the rule making test for changes to the NER/NERR;
- the assessment framework for considering the rule change request; and
- the Commission's consideration of the draft rule against the national electricity objective/national energy retail objective.

Further information on the legal requirements for making this draft rule determination is set out in Appendix B.

2.2 Rule making test

2.2.1 Achieving the national electricity objective and national energy retail objective

Under the National Electricity Law (NEL) the Commission may only make a rule if it is satisfied that the rule will, or is likely to, contribute to the achievement of the national electricity objective (NEO).[19]

The NEO is:[20]

> "to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system."

19 Section 88 of the NEL.

20 Section 7 of the NEL.

Under the National Energy Retail Law (NERL) the Commission may only make a rule if it is satisfied that the rule will, or is likely to, contribute to the achievement of the national energy retail objective (NERO).[21] This is the decision making framework that the Commission must apply.

The NERO is:[22]

> "to promote efficient investment in, and efficient operation and use of, energy services for the long term interests of consumers of energy with respect to price, quality, safety, reliability and security of supply of energy."

The Commission must also, where relevant, satisfy itself that the rule is "compatible with the development and application of consumer protections for small customers, including (but not limited to) protections relating to hardship customers" (the "consumer protections test").[23]

Where the consumer protections test is relevant in the making of a rule, the Commission must be satisfied that both the NERO test and the consumer protections test have been met.[24] If the Commission is satisfied that one test, but not the other, has been met, the rule cannot be made.

2.3 Assessment framework

In assessing the rule change request against the NEO/NERO the Commission considered the following criteria as part of its assessment of the rule change request:

- **Improve operation of the power system –** the potential of the proposed rule change to better inform NSPs' and AEMO's operational decisions and processes relating to the efficient operation of the power system.
- **Promote better investment decisions –** the potential of the proposed rule change to better inform aspects of market participants' decision-making to promote efficient investment and appropriate risk management.
- **Regulatory and administrative burden –** whether the cost of introducing a DER register is proportional to the costs of managing the issue it is trying to resolve.
- **Clear roles and responsibilities –** the degree to which the design of a DER register could allocate clear roles and responsibilities to promote effective implementation including appropriate compliance and enforcement functions.

21 Section 236(1) of the NERL.

22 Section 13 of the NERL.

23 Section 236(2)(b) of the NERL.

24 That is, the legal tests set out in s.236(1) and (2)(b) of the NERL.

- **Balance information transparency and confidentiality** – the degree to which a register could achieve an appropriate balance between information needs and confidentiality needs, including for:
  - NSPs and AEMO to have access to the granularity and range of data it requires to improve the operation of the power system
  - other market participants to have access to an appropriate level of data to inform operational and commercial decisions
  - consumers to provide relevant information while their privacy is appropriately protected.

2.4 Summary of reasons

The Commission has assessed whether the proposed rule change request will, or is likely to, contribute to the achievement of the NEO/NERO and has evaluated the proposed rule change request against the assessment framework set out above.

The Commission considers that changes to the NER adequately address the issues set out in the proposed rule change request and therefore changes to the NERR are not required.

2.4.1 Key features of the draft rule

Having considered views expressed by stakeholders in submissions and undertaken further analysis on the likely benefits of the proposed rule change, the Commission has determined to make a draft rule to address the issues identified, which incorporates many of the elements of the solutions proposed by the COAG Energy Council.

The draft rule is attached to and published with this draft rule determination. The key features of the draft rule are summarised below.

The draft rule:

- places an obligation on AEMO to establish, maintain and update a register of static data for DER devices in the NEM
- requires NSPs to request from their customers the specific DER information outlined by AEMO in guidelines (through the network connection process and deemed standard connection contract) and provide this to AEMO
- places an obligation on AEMO to develop, maintain and publish DER register information guidelines that specify, amongst other things, the details of the information that NSPs must provide to AEMO, as well as when and how the information is to be provided
- requires NSPs to provide AEMO with their known information about existing DER within their network as required in the guidelines (and to the extent they

hold this information) as part of the first reporting cycle after the guidelines commence

- introduces a data sharing framework that obliges AEMO to share disaggregated data regarding the locational and technical characteristics of devices in the DER register with network businesses in relation to their network areas, subject to privacy laws and protected information provisions in the National Electricity Law (NEL)

- places an obligation on AEMO to periodically report publicly relevant information from the DER register at an appropriate level of aggregation

- places an obligation on AEMO to publish details, no less than annually, on its use of the DER information received under this rule

- allows AEMO to provide DER register information to an emergency services agency if requested for the purposes of that agency's response to an emergency or for planning in relation to emergency responses.

2.4.2 Reasons for making the draft rule

While the DER register will collect static information on DER rather than dynamic information, there is a benefit to both AEMO and network service providers from having access to static data on DER. Improved information on the static characteristics of devices is a first step towards increasing system visibility over DER, and has the potential to better inform the decisions and processes of energy market stakeholders, including AEMO and network service providers. The introduction of a DER register will contribute to better outcomes for consumers in the longer term through:

- **Promoting better investment decisions:** The introduction of a DER register will assist NSPs with network planning by affording them improved visibility over the DER installed on their networks. Increasing visibility of DER should result in a more efficient, less conservative approach to asset investment.

- **Improving operation of the power system:** A DER register will improve visibility over DER, and, facilitate improvements in the quality of AEMO's load forecasting and modelling. Increased visibility should also assist the NSPs with network operation through increasing the capability of their networks by assisting with optimising distribution network load shedding and forecasting future potential quality of supply issues.

- **Minimising regulatory and administrative burden:** As the benefits of a DER register of static data are likely to be incremental and commensurate to the nature of the information collected, it is important that the costs of the register will not be disproportionately large in comparison to its expected benefits. The design of the DER register has been formulated to avoid significant cost outlays by AEMO or other Registered Participants, e.g. by avoiding duplicating existing data or introducing new reporting obligations on market participants. Where

possible, the Commission has leveraged existing mechanisms under the NER and the NERR for the collection of data to be placed in the DER register.

The draft rule provides a process by which AEMO and NSPs may obtain information on DER which will allow more efficient operation of and investment in the power system through:

- **Clear roles and responsibilities:** The draft rule outlines clear roles and responsibilities for different parties to promote effective implementation of the DER register:
  - The draft rule places an obligation on AEMO to establish and maintain the register. AEMO is an appropriate host for a register of distributed energy resources as it is a primary beneficiary of the data being collected, and therefore has an incentive to ensure the register is accurate and complete. AEMO also has existing interfaces to transfer data with distribution businesses, as well as procedures to collate, aggregate and analyse this data and has well-established procedures regarding the protection of privacy and confidentiality of data.
  - The draft rule requires NSPs to request from customers the specific DER information outlined by AEMO in its guideline. NSPs, through the network connection process, model standing offers and deemed standard connection contract, are best placed to facilitate data collection and provide it to AEMO.
- **Balancing information transparency and confidentiality**: In light of stakeholder submissions and further analysis undertaken, the Commission is satisfied that the draft rule provides an appropriate balance between information needs and confidentiality needs. The draft rule allows data sharing to achieve the objectives of the register. For example the draft rule provides AEMO with the flexibility to determine through a consultation process the appropriate level of granularity and range of data to be collected, e.g. data fields, required to improve the operation of the power system. The draft rule introduces a data sharing framework that obliges AEMO to share disaggregated data regarding the locational and technical characteristics of devices in the DER register with network businesses in relation to their network areas, subject to privacy laws and protected information provisions in the NEL.

  To achieve the appropriate level of data sharing useful for policy-makers, researchers, consultants and other market participants, the draft rule places an obligation on AEMO to periodically report publicly relevant information from the DER register at an appropriate level of aggregation.

3 Need for the register

This chapter discusses the need for the register, including the expected benefits and costs that may arise from its establishment.

3.1 COAG Energy Council's view

The rule change request advocated that a register of DER will contribute to "the achievement of lower costs, improved security and safety and more reliable supply outcomes" through having greater visibility of behind the meter systems in the NEM.[25]

In particular, the COAG Energy Council envisioned the primary benefits of the proposed rule change would result from:[26]

- improving AEMO's ability to manage power system security and operation
- improving the efficiency of network investments
- leading to better medium to long term network planning.

The COAG Energy Council also envisaged that a register would provide a range of secondary benefits, including helping protect the safety of the public in the event of emergencies involving DER, and improving policy and market outcomes.[27] These benefits will be discussed in Chapters 8 and 7.

3.2 Stakeholder views

Most stakeholders were supportive of establishing a register of distributed energy resources in some form.[28] Several stakeholders, including EnergyAustralia and Greensync, expressed qualified support on the basis that further analysis into the case for the register should be completed.[29]

Stakeholders that were not supportive of the proposal in its current form included AGL, Red Energy and Lumo Energy and Dr Martin Gill. AGL commented that network businesses should already be well positioned to provide an aggregated view on the impacts of DER. In addition, AGL was of the view that AEMO should be able to

25 Rule change request, p. 13.

26 Rule change request, p. 13.

27 Rule change request, pp. 15-16.

28 Consultation paper submissions: AEMO, p. 1; CitiPower, Powercor, United Energy, p. 1; S&C Electric Company, p. 2; SA Power Networks, p. 1; Transgrid, p. 1; AusNet Services, p. 1; TasNetworks, p.1; AER, p. 1; Energy Networks Australia, p. 1; Jemena, p. 1; Endeavour Energy, p. 1; Formbay, attachment 1, p. 1; Centre for Energy and Environmental Markets - UNSW, p. 2; Energy Queensland, p. 1; PIAC, p. 1; Ausgrid, p. 1; Clean Energy Council, p. 1; and Deakin University, p. 1.

29 Consultation paper submissions: EnergyAustralia, p. 1; Greensync, p. 4.

aggregate a range of useful information on DER under its Demand Side Participation Information guideline.[30]

Several stakeholders suggested that including dynamic DER data would increase the benefits articulated by the rule change request, by providing more accurate insight into the behaviour of DER devices and their subsequent impact on the power system.[31]

However, the Centre for Energy and Environmental Markets at UNSW (CEEM) and Formbay considered that the static register is an appropriate first step towards DER integration, and that it will provide sufficient benefits to power system security and operation to justify its establishment.[32]

3.2.1 Benefits of the register

Network planning and operation

Distribution businesses and others were generally supportive of the proposed rule change, suggesting that the register could assist networks by:[33]

- enabling improved forecasting of long term demand, thereby assisting in network planning
- enabling improved forecasting of short term energy flows, thereby assisting in network operation
- identifying opportunities for non-network options to defer or avoid network investment (such as demand management).

Transgrid submitted that transmission businesses should also have access to the information in the DER register, indicating that increased visibility would assist with transmission network planning and operation in similar ways to the benefits outlined for distribution businesses.[34]

30 AGL, submission to consultation paper, p. 1.

31 Consultation paper submissions: Dr Martin Gill, p. 4; Greensync, p. 2; S&C Electric Company, pp. 3-5; AGL, p. 2; Centre for Energy and Environmental Markets - UNSW, p. 12; EnergyAustralia, p. 2; AER, p. 3; Deakin University, p. 3; Ausgrid, attachment 1, p. 3.

32 Consultation paper submissions: Centre for Energy and Environmental Markets - UNSW, p. 5; Formbay, attachment 1, p. 2.

33 Consultation paper submissions: CitiPower, Powercor, United Energy p. 1; SA Power Networks, p. 1; AusNet Services, appendix A, p. 1; TasNetworks, p. 1; Energy Queensland, p. 6; Jemena, p. 2; Ausgrid, attachment 1, p 3; Endeavour Energy, p. 1; Energy Networks Australia, p. 3; AER, pp. 1-2; Clean Energy Council, p. 3; S&C Electric Company, p. 4; Centre for Energy and Environmental Markets - UNSW, p. 4; Formbay, attachment 1, p. 2; PIAC, attachment 1, p. 3; Tasmanian Renewable Energy Alliance, pp. 2-3

34 Transgrid, submission to consultation paper, p. 1.

Market planning and operation

AEMO put forward that it requires enhanced DER information to support its operational processes managing power system security. In particular, AEMO suggested that the proposed DER register would contribute to:[35]

- improved forecasting of load
- improved response of load to system disturbances
- better data accuracy and more accurate modelling
- more efficient dispatch of generation.

Most stakeholders agreed that a static register of DER information could benefit AEMO, at least to some extent, by providing it with more information to efficiently manage the balance of supply and demand in the NEM and to plan against contingency events.[36] For example:

- The Centre for Energy and Environmental Markets at UNSW suggested that DER data could assist AEMO in making more accurate forecasts for network and market investment. It said that the technical envelope of power system operation is changing with DER uptake, and put forward that improved visibility is likely to help AEMO in determining its efficient bounds.[37]
- Energy Queensland agreed that the register may improve AEMO's calculation of the technical envelope, and noted that system damage, overload or safety issues may occur if there is not careful coordination between AEMO and the DNSP regarding the limitations and constraints of each distribution system.[38]

3.2.2 Costs of the register

Stakeholders who were supportive of the Jacobs' cost benefit analysis included CitiPower, Powercor, United Energy, Ausgrid and Energy Queensland.[39] Formbay considered that the costs identified in the cost benefit analysis were too high, given the range of technologies currently available to capture DER data.[40]

35 AEMO, submission to consultation paper, p. 1.

36 Consultation paper submissions: Jemena, p. 2; S&C Electric Company, p. 4; Energy Queensland, p. 7; PIAC, p. 4; Centre for Energy and Environmental Markets - UNSW, p. 4; Deakin University, p. 4; Clean Energy Council, p. 2; Formbay, attachment 1, p. 1.

37 Centre for Energy and Environmental Markets - UNSW, submission to consultation paper, p. 6.

38 Energy Queensland, submission to consultation paper, p. 7.

39 Consultation paper submissions: CitiPower, Powercor, United Energy, p. 1; Energy Queensland, p. 9; Ausgrid, attachment 1, p. 5.

40 Formbay, submission to consultation paper, attachment 1, p. 3.

Most stakeholders, however, were of the view that the costs to establish and maintain the register are likely to be larger than those identified in the cost benefit analysis.[41] For example:

- SA Power Networks suggested that additional costs would arise from ensuring compliance, enhancements to IT systems and development of an interface to a national register.[42]
- AusNet Services indicated there would be significant costs arising from establishing a new data interface between AEMO and DNSPs.[43]
- TasNetworks suggested that there would be substantial costs involved in retooling its operations to facilitate data collection of the type envisioned by the register. It advised that of the 11 data fields suggested in the consultation paper, TasNetworks currently collects only three.[44]
- Endeavour Energy estimated that the development of new systems and processes would cost it $1 million.[45]

AEMO estimated that it will cost approximately $1.1 million for it to establish the DER register, subject to final design of the collection process. It estimated that ongoing costs would be in the order of $150,000 per annum; with improvements in technology expected to mitigate collection costs over time.[46]

Several stakeholders emphasised the importance of minimising the costs associated with the register, in order for sufficient value to be realised from the project.[47] For example, AusNet Services considered that a good way to minimise additional costs would be for installers and customers to provide DER information to DNSPs in accordance with the current connection arrangements detailed in the NER.[48]

41 Consultation paper submissions: SA Power Networks, attachment 1, p. 3; AusNet Services, appendix A, p. 3; Dr Martin Gill, p. 4; Red Energy and Lumo Energy, p. 1; EnergyAustralia, p. 1, Clean Energy Council, p. 3.

42 SA Power Networks, submission to consultation paper, attachment 1, p. 3.

43 AusNet Services, submission to consultation paper, appendix A, p. 3.

44 TasNetworks, submission to consultation paper, p. 2.

45 Endeavour Energy, submission to consultation paper, p. 6.

46 AEMO, submission to consultation paper, attachment 1, p. 2.

47 Consultation paper submissions: AGL, p. 5; AusNet Services, appendix A, p. 3.

48 AusNet Services, submission to consultation paper, appendix A, p. 3.

3.3 Analysis

Potential to improve power system security and operation

The energy sector is undergoing a major transition driven in part by the increasing uptake of distributed energy resources by consumers and businesses. These systems provide opportunities to manage the power system in new ways, particularly with advanced metering and remote control.

However, a key challenge of the transition is that existing regulatory frameworks were designed around a centralised system of electricity generation and distribution, and the market is experiencing a shift to a more decentralised one.

In this context, there is an emerging need for AEMO and network service providers to have greater visibility over distributed energy resources as the aggregate impact of DER on the power system grows. Establishing a DER register is likely to go some way towards managing the risks brought about by the uptake of these new technologies.

Under the draft rule, AEMO will establish and administer a register of distributed energy resources that includes:

- information that NSPs must provide to AEMO in relation to DER, the detail of which is to be specified by AEMO guidelines
- information reported under AEMO's Demand Side Participation Information Guideline which in AEMO's reasonable opinion is relevant to the DER register
- information provided to AEMO from other sources, in the performance of AEMO's functions, which in AEMO's reasonable opinion will assist network service providers to meet their regulatory obligations or requirements.

AEMO, in turn, will be obliged to share disaggregated data in the DER register with network service providers in relation to their network areas. The draft rule will also place an obligation on AEMO to periodically report publicly information from the register at an appropriate level of aggregation.

In terms of the potential for the draft rule to improve power system security and operation, the Commission considers that:

- establishing a national register of DER static information may improve energy market participants' visibility over DER, and, in turn, lead to potential improvements in the quality of load forecasting and modelling by AEMO and network service providers
- better informed load forecasting and modelling has the potential to contribute to better decisions by AEMO, network service providers and other energy market participants

- better informed decisions may improve the efficiency, security and operation of the NEM.

Network planning and operation

The Commission agrees with stakeholder comments that a DER register may assist NSPs (including distribution and transmission businesses) with network planning and operation by affording them improved visibility over the DER installed on their networks.

In terms of network operation, SA Power Networks indicated that the DER register should increase the capability of networks, working with AEMO, to optimise distribution network load shedding. This could be achieved, for example, by prioritising shedding of feeders with less distributed generation to lower the impact and severity of load shedding. In addition, the register could also assist networks to forecast future potential quality of supply issues.[49]

In terms of network planning, several stakeholders suggested that increased visibility of DER should result in a more efficient, less conservative approach to asset investment. Knowledge of DER virtual power plants and market affiliations should also improve networks' ability to procure targeted network support services in the future.[50]

In particular, Energy Queensland suggested that greater visibility over distributed energy resources would enable network service providers to anticipate and plan for issues proactively. It indicated that additional information regarding the distribution of DER throughout its network would enable it to conduct more effective planning, e.g. by modelling seasonal differences to anticipate problems and by identifying the potential for coincidence of charging with localised peak demand.[51]

Market planning and operation

The Commission agrees that a register of distributed energy resources would assist AEMO by providing it with more information to efficiently manage the balance of demand and supply in the NEM, and to plan against contingency events.

In particular, AEMO has advised that data from the register could assist with many of its forecasting models and operational processes, from real-time system analysis and short term market forecasts to planning studies that cover 10–20 year horizons.[52]

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49 SA Power Networks, submission to consultation paper, attachment 1, p. 1.

50 Consultation paper submissions: AER, pp. 1-2; Endeavour Energy, p. 4; Energy Queensland, p. 7; S&C Electric Company, p. 4; SA Power Networks, attachment 1, p. 2; Tasmanian Renewable Energy Alliance, p. 2.

51 Energy Queensland, submission to consultation paper, p. 6.

52 In particular, AEMO foresees the data as an input into the following models/processes: Australian Solar Energy Forecasting System; Demand Forecasting System; Pre-dispatch; Short-term Projected Assessment of System Adequacy; Medium-term Projected Assessment of System Adequacy; Energy Adequacy Assessment Projection; National Electricity Forecasting Report; Connection Point

To efficiently carry out these functions, AEMO has indicated that it needs to be able to predict daily load profile, how quickly demand will change, as well as the minimum and maximum demand sought.[53] As the general uptake of DER increases, AEMO has suggested that it will require improved visibility over the population of DER devices, as, in aggregate, they will have significant capacity to change load behaviour and are less predictable in nature.

According to AEMO, the register would also contribute to an improved understanding of how load responds to system disturbances. Without a DER register, AEMO has advised that it would need to apply more conservative limits on the technical envelope given uncertainty around load behaviour. This would result in more stringent constraints in the dispatch process and would make it more challenging to plan short term outages.[54]

In addition, AEMO noted that the efficacy of emergency frequency control schemes, such as under frequency load shedding, remain unknown without knowledge of the DER inverter trip settings. It advocated that the DER register would assist AEMO's ability to operate the power system within the frequency operating standards by increasing visibility in this area.[55]

An initial step towards increasing visibility of DER

A key issue for many stakeholders was the fact that the register will only include static information; they consider that dynamic behaviour data may ultimately be of greater use to AEMO and network service providers.[56]

AEMO considers that a static register will increase visibility over the locational and technical characteristics of DER devices, forming a key input to the models and processes described above. However, it has also previously noted in its 2017 *Visibility of Distributed Energy Resources* report that, as penetration levels increase, real-time DER data will also be required.[57]

The Commission considers that there is a benefit to both AEMO and network service providers from having access to static data on DER. However, these benefits are likely to be incremental and commensurate to the nature of the information collected. For example, it is expected that AEMO will be able to improve its operational processes by

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Forecast; Electricity Statement of Opportunities; and National Transmission Network Development Plan. AEMO confirmed this by email on 6 April 2018.

53 AEMO, *Visibility of Distributed Energy Resources*, January 2017, p. 12

54 AEMO, *Presentation to AEMC stakeholder forum on Register of Distributed Energy Resources*, 27 March 2018, p. 12.

55 AEMO, *Presentation to AEMC stakeholder forum on Register of Distributed Energy Resources*, 27 March 2018, p. 12.

56 Consultation paper submissions: Dr Martin Gill, p. 4; S&C Electric Company, pp. 3-5; AGL, p. 2; Centre for Energy and Environmental Markets - UNSW, p. 12; EnergyAustralia, p. 2; AER, p. 3; Deakin University, p. 3; Ausgrid, attachment 1, p. 3.

57 AEMO, *Visibility of Distributed Energy Resources*, January 2017, p. 36.

being able to access certain technical characteristics, such as the trip settings of DER devices.

Given the incremental nature of the likely benefits, the Commission's approach has been to minimise the costs of the register such that they will not be disproportionately large. The design of the DER register has been formulated with a view to avoiding significant cost outlays by AEMO or other Registered Participants that may arise by duplicating existing data or introducing new reporting obligations on market participants.

Where possible, the Commission has leveraged existing mechanisms[58] under the NER for the collection of data to be placed in the DER register. This is discussed in further detail in Chapter 5.

3.4 Commission's position

The Commission considers that the draft rule provides a process for AEMO, network service providers and other interested stakeholders to obtain information on DER uptake across the NEM.

Improved information on the static characteristics of devices is a first step towards increasing system visibility over DER, and has the potential to better inform the decisions and process of energy market stakeholders, including AEMO and network service providers.

Issues associated with further integration of DER in the NEM are the subject of a number of other processes, including a consultation paper on *Open Energy Networks* jointly published by Energy Networks Australia and AEMO on 15 June 2018, and the Commission's *2018 Economic Regulatory Framework Review*, which is assessing the role of electricity distribution networks in optimising the value provided by DER.

58 Including the connection application processes detailed in Chapter 5 and the Demand Side Participation Information rule detailed in Chapter 3.7D.

4 Governance

This chapter discusses the following considerations:

1. which party should be accountable for the establishment and maintenance of the register

2. what scope of powers should be given to the party establishing and maintaining the register

3. how the types of distributed energy resources included in the register should be defined

4. what other limits, if any, should be placed on the types of systems included in the register.

4.1 COAG Energy Council's view

In its rule change request, the COAG Energy Council outlined a broad set of potential changes to the National Electricity Rules that would establish a governance framework for the register. These included:[59]

- a requirement for AEMO to administer a register of distributed energy resources

- a set of principles that broadly define how AEMO should determine the types and capacity of DER that should be included in the register

- a requirement that AEMO must develop, maintain, publish and amend a guideline outlining the specific types of DER to be included in the register, subject to the above principles, as well as the required data sets.

The rule change request did not specify the NER principles that would guide AEMO in determining the types and capacity of DER that should be included in the register.

The COAG Energy Council noted that it aims to improve the visibility of small scale behind the meter DER in the NEM. 'Small scale', 'behind the meter' and 'distributed energy resources' were not defined in the rule change request, nor are they defined in the NER.

59 Rule change request, p. 1.

4.2 Stakeholder views

Establishment and maintenance of the register

Stakeholders who commented on this aspect of the rule change request, including Jemena, SA Power Networks, TasNetworks, Energy Networks Australia and S&C Electric Company, agreed that AEMO would be the most suitable host for the register.[60]

Scope of the rules and the guideline

In the consultation paper, stakeholders were asked to share their views regarding the scope of the NER versus guidelines in determining what types of DER are eligible for inclusion in the register.

Most stakeholders were in favour of the proposal for AEMO to develop DER guidelines through a consultative process, subject to certain principles or requirements set out in the NER.[61] However, they disagreed over what specific information should be placed in NER principles versus what should be determined in a guideline. For example:

- PIAC and Ausgrid considered that DER should be defined in the NER, with certain detailed elements then defined in an AEMO guideline[62]
- AusNet Services considered that the NER should include a definition of DER equipment while an AEMO guideline should outline what additional demand response should be included in the register[63]
- TasNetworks put forward that DER should be wholly determined in an AEMO guideline.[64]

The Clean Energy Council disagreed with the proposed governance framework, noting that "it would be preferable to utilise a mechanism with more transparency and accountability than AEMO guidelines".[65] One solution recommended was to include more detailed prescription in the NER.

60 Consultation paper submissions: Jemena, p. 1; SA Power Networks, p. 1; TasNetworks, p. 5; Energy Networks Australia, p. 2; S&C Electric Company, p. 3.

61 Consultation paper submissions: SA Power Networks, attachment 1, pp. 3-4; Ausgrid, attachment 1, pp. 8-9; AusNet Services, appendix A, p. 4; TasNetworks, p. 5; Formbay, attachment 1, p. 4; Jemena, p. 4; Energy Queensland, p. 11; Endeavour Energy, p. 8; PIAC, attachment 1, p. 5; Dr Penelope Crossley - University of Sydney Law School, p. 4.

62 Consultation paper submissions: PIAC, attachment 1, p. 5; Ausgrid, Attachment 1, pp. 8-9.

63 AusNet Services, submission to consultation paper, appendix A, p. 4.

64 TasNetworks, submission to consultation paper, p. 5.

65 Clean Energy Council, submission to consultation paper, p. 4.

AEMO requested that the framework be clear that it would be able to apply the data in the register for the purposes of operating the power system and maintaining security of supply.

AEMO also agreed with the COAG Energy Council's proposal for it to be required to consult on and publish a guideline that specifies the exact types of DER systems included in the register, and the specific data to be collected. It proposed the following set of principles be enshrined in the NER for it to have regard to when drafting the guidelines:[66]

- flexibility
- industry consultation
- DER includes generation and load under 5MW without further specified constraint
- capability to update the guideline as required.

Several stakeholders, including AEMO, CitiPower, Powercor, United Energy, PIAC, Deakin University and the Centre for Energy and Environmental Markets at UNSW,[67] noted that the governance framework should have sufficient flexibility, while maintaining consumer protections, to capture new technologies into the database and to enable innovative applications of the data.

Other stakeholders proposed that AEMO should consider the following principles when developing its guidelines:

- Industry standards, privacy, resilience and best practice (Formbay).[68]
- Jurisdictional consistency, quality control, standardised formatting and accessibility of data (Centre for Energy and Environmental Markets - UNSW).[69]
- Privacy, right to information, equity, regulatory and administrative burden, technical considerations, compliance mechanisms and regard for stakeholders who will be using the guideline (TasNetworks).[70]

66 AEMO, submission to consultation paper, attachment 1, pp. 2.

67 Consultation paper submissions: AEMO, attachment 1, p. 2; CitiPower, Powercor, United Energy, p. 2; PIAC, p. 1; Deakin University, p. 6; Centre for Energy and Environmental Markets - UNSW, p. 8.

68 Formbay, submission to consultation paper, attachment 1, p. 4.

69 Centre for Energy and Environmental Markets - UNSW, submission to consultation paper, p. 8.

70 TasNetwork, submission to consultation paper, p. 5.

Definition of distributed energy resources

In its 2017 *Distribution Market Model* report, the Commission defined distributed energy resources as "an integrated system of energy equipment co-located with consumer load".[71] A limited number of stakeholders, including Energy Queensland and Formbay, were supportive of using this definition in the context of the DER register.

Most stakeholders disagreed with using the definition of 'distributed energy resources' canvassed in the *Distribution Market Model* report, citing that distributed generation devices are not always co-located with consumer load (Clean Energy Council, SA Power Networks, Jemena and Deakin University). Other stakeholders objected to the term 'energy equipment', noting:

- that it may capture an excessively broad range of technologies over and above what it likely to be required to meet the objectives of the register[72], or
- that the definition does not explicitly allow for demand response (PIAC, S&C Electric Company, AusNet Services and Centre for Energy and Environmental Markets at UNSW). TasNetworks argued that, from a network planning perspective, demand response information would be just as useful as distributed generation; however, it is potentially much more difficult to collect.[73]

AEMO and Endeavour Energy proposed their own definition of 'distributed energy resources' as:

- a system that is capable of generating energy, storing energy or modifying energy demand that is located at or close to where energy is consumed and typically connected to the distribution network (Endeavour Energy)[74]
- any form of energy resource that is not formally registered as a generator, potentially connected to a distribution network, that can be utilised to generate, consume, shift or offset load (AEMO).[75]

Other limits on the types of eligible systems included in the register

The consultation paper sought stakeholder views on how 'small scale' and 'behind the meter' should be defined with regard to the DER register.

Small scale

The COAG Energy Council suggested that 'small scale' should, at minimum, be understood as a range of generation systems below 5 MW in size.[76] This is because

71 AEMC, *Distribution Market Model*, final report, August 2017, pp. 4-5.

72 Ausgrid, submission to consultation paper, attachment 1, p. 7.

73 TasNetworks, submission to consultation paper, p. 4.

74 Endeavour Energy, submission to consultation paper, p. 8.

75 AEMO, submission to consultation paper, attachment 1, p. 3.

76 Rule change request, p. 1.

AEMO currently automatically exempts generators with a capacity of 5MW or less from needing to register as a generator in the NEM, and visibility over these systems is low.[77]

In its submission to the consultation paper, AEMO stated that:[78]

- the register should capture generation and demand responsive load under 5MW, and that it should not have a minimum capacity limit
- the register should also capture exempt generation facilities above 5MW. While most generation systems above 5MW are currently registered as a generator in the NEM, AEMO noted that some larger systems have been granted exemption from registration due to the fact that they export a limited amount of energy and sell to a local retailer. AEMO said there is limited information available about these systems and that it would prefer the register to capture this form of DER as well.

Most DNSPs and other stakeholders were generally in favour of limiting 'small scale' to systems below 5MW, in order to align the definition with AEMO's current automatic exemption from the requirement to register as a generator.[79]

Behind the meter

In the *Contestability of energy services* final determination, published by the AEMC on 12 December 2017, the Commission considered a range of options for the spatial demarcation of 'behind the meter' or similar concepts. In that context, the Commission considered that the clearest approach was to use the connection point instead of the meter as the relevant spatial reference, and refer to equipment that is electrically connected to the network on a retail customer's side of the connection point.[80]

Most distribution businesses and other stakeholders were supportive of using 'connection point' as the appropriate spatial demarcation for DER devices to be included in the register.[81] AEMO considered that the DER register should not refer to any spatial demarcation, noting that DER systems will in aggregate be able to impact the power system in a similar manner to utility scale plant, regardless of where they are located.[82]

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77 AEMO, *NEM Generator Registration Guide, August 2016*, p. 25

78 AEMO, submission to consultation paper, attachment 1, pp. 3-4.

79 Consultation paper submissions: Ausgrid, attachment 1, p. 7; Energy Queensland, p. 10; Jemena, attachment 1, p. 3; Endeavour Energy, p. 7; AusNet Services, appendix A, p. 4; Clean Energy Council, p. 4; and Formbay, attachment 1, p. 4.

80 AEMC, *Contestability of energy services*, final determination, December 2017, p. 54.

81 Consultation paper submissions: SA Power Networks, attachment 1, p. 3; Jemena, attachment 1, p. 3; AusNet Services, appendix A, p. 4; Energy Queensland, p. 10; EnergyAustralia, p. 2; Endeavour Energy, p. 7; Ausgrid, attachment 1, p. 7; Clean Energy Council, p. 4; Deakin University, p. 6; and Formbay, attachment 1, p. 4.

82 AEMO, submission to consultation paper, attachment 1, p. 4.

4.3 Analysis

4.3.1 Establishment and maintenance of the register

The Commission considers that AEMO is the appropriate person to establish and maintain for a register of distributed energy resources as it:

- is a primary beneficiary of the data being collected, and therefore has an incentive to ensure the register is accurate and complete
- has extensive experience establishing and managing large complex datasets of a similar nature (for example, the Market Settlement and Transfer Solution database)
- has existing interfaces to transfer data with network businesses, as well as procedures to collate, aggregate and analyse this data
- has well-established procedures regarding cyber security, privacy and confidentiality of data.

4.3.2 Scope of the rules and the guideline

Merit in flexibility

The Commission considers that there is merit in a rule that provides some flexibility to AEMO with respect to the detail of the nature and form of information included in the register. This is because:

- AEMO, in consultation with Registered Participants and other interested parties, is well placed to develop the details of the data requirements of the register. In particular, AEMO and Registered Participants' knowledge of relevant issues are likely to include:
  - the costs and benefits of the provision of DER information
  - the appropriate granularity and accuracy requirements in respect of the information provided to the register, and the impact of such requirements on costs and benefits
  - information confidentiality considerations.
- As noted by stakeholders, the governance structure should have sufficient flexibility to capture new technologies into the database. It is very likely that the nature of distributed energy resources will change in the future, driven by market led developments (e.g. new technologies) or regulatory change. Guidelines allow for a greater degree of flexibility to account for these potential changes, in comparison to an alternative governance structure where detailed prescription is included in the NER.

The Commission is of the view that the draft rule should not include unnecessary prescription in respect of technical matters or administrative matters (apart from the general constraints outlined below). In particular, we consider that it is appropriate for AEMO to specify when NSPs are to provide and update DER information, as well as the format in which it is to be provided. We note that many stakeholders commented on the frequency of reporting, and encourage AEMO to take these comments into account when drafting its guideline.[83]

Providing certainty and minimising regulatory burden

In making the draft rule, the Commission has considered:

- the merit in outlining a set of principles or requirements in the NER that broadly defines how AEMO should determine the types and capacity of DER included in the register
- AEMO's preference for the NER to specify that it is able to use information from the register for the purposes of operating the power system and maintaining security of supply
- the potential for unnecessarily onerous regulatory obligations being imposed through any guidelines developed.

The Commission concluded that it should place some broad limits around the types of 'DER information' that are to be included in the register. As noted by Ausgrid,[84] there is benefit in form of regulatory certainty in outlining in the NER the scope of the register to collect DER information.

The draft rule specifies that the register should contain:

- information that NSPs must provide to AEMO in relation to DER (DER generation information) in relation to their network and which they are obliged to collect under the NER (see section 4.3.3)
- information reported under the Demand Side Participation Information Guideline which in AEMO's opinion is relevant to the DER register
- DER information provided to AEMO in the performance of AEMO's functions which in AEMO's opinion will assist NSPs to meet their regulatory obligations or requirements.

The draft rule also specifies that AEMO must use the DER register information for the purposes of developing or using its load forecasts, and may use this information for the

83 For example, Jemena (submission to consultation paper, p. 5) and Centre for Energy and Environmental Markets - UNSW (submission to consultation paper, p. 9) suggested that the data transfer could occur monthly, whilst Ausgrid (submission to consultation paper, Attachment 1, p. 9) suggested the data could be collected annually by AEMO.

84 Ausgrid, submission to consultation paper, attachment 1, p. 9.

purpose of the exercise of its functions, including performing its power system security responsibilities.

To alleviate the risk that overly onerous obligations are placed on NSPs through the guidelines, the draft rule places an obligation on AEMO to:

- provide Registered Participants and other interested parties an opportunity to engage with, and inform, AEMO of their views on DER register guidelines through the consultation process that AEMO must conduct when developing or amending the guidelines
- have regard to the reasonable costs of efficient compliance by NSPs with the guidelines
- report, no less than annually, on the extent to which, in general terms, DER register information received under the rule has informed its development or use of load forecasts or the performance of its power system security responsibilities.

The Commission is of the view that public consultation by AEMO during the development or amendment of the guidelines will provide distribution businesses with an avenue to challenge any proposal that is overly onerous.

The last requirement to report on its use of information represents an appropriate and reasonably low cost obligation on AEMO, while providing information to the public on the extent to which the information received under the guidelines has informed AEMO's functions. There could be no need for a stand-alone report to fulfil this obligation and AEMO could incorporate it into one of its existing reports.

4.3.3 DER register information

As noted above, there is currently no definition of 'distributed energy resources' in the NER.

In light of this, the Commission has taken a broad view on the meaning of DER in the draft rule as constituting:

- distributed generation; and
- load that is responsive to either the demand for, or price of, electricity.

It is important to note that distributed generation can be both 'smart'[85] or 'passive'[86] in nature.

85 That is, the generation device has the ability to respond automatically to short term changes in prices or signals from wholesale markets or elsewhere in the supply chain.

86 For example, a rooftop solar PV system that generates and feeds power into the grid when the sun shines.

The Commission considers that load must be 'smart' in order to be characterised as a distributed energy resource for the purposes of the register. This distinction has been made in order to limit the coverage of the DER register to devices that have the effect of injecting power into the electricity network, either through direct generation or the active curtailment of load.

The Commission considers that AEMO has sufficient expertise to accurately forecast new forms of 'passive' load, in part by identifying correlating factors (e.g. weather, time of day, day of week, electricity prices) and in part by relying on the underlying diversity in the behaviour of consumers. In contrast, 'active' load is likely to be more difficult to forecast in aggregate as it is reliant on external commercial drivers that are less predictable. For example, a demand response contract between a network service provider and a consumer might alter the behaviour of an appliance (such as an air conditioner) during a time when it would otherwise be expected to operate (during peak demand on a hot summer's day).

One advantage of this approach is that it is technology neutral, which is important given the rapid pace of change in the DER sector. In its *Visibility of distributed energy resources report*, AEMO emphasized the importance of developing a framework that could be easily applied to new technologies subject to mass market uptake, given their potential impacts on power system operation.[87]

Minimising regulatory burden and the duplication of data

In devising the governance framework for the register, the Commission's preference was to limit the potential for unnecessary regulatory burden to be placed on Registered Participants and, in particular, to minimise any costs associated with the duplication of data.

We consider that the 'active' load information that is relevant to the DER register is already being reported to AEMO under its Demand Side Participation Information Guideline. In order to avoid duplicating the data collection process for 'active' load information, the Commission considers that AEMO should include the relevant information already being reported under the DSP guidelines into the DER register on an ongoing basis.

Box 4.1 Demand Side Participation Guideline

On 26 March 2015, the Commission made a rule that allowed AEMO to obtain information on demand side participation (DSP) from Registered Participants. The final rule required AEMO to develop guidelines, in consultation with Registered Participants and other interested stakeholders that specified the required DSP information amongst other things.

87 AEMO, *Visibility of distributed energy resources*, January 2017, pp. 40-41.

Demand side participation information comprises:

- contractual arrangements between a person and the Registered Participant providing the DSP information, under which the Registered Participant and that person agree to curtail non-scheduled load or provide unscheduled generation in specified circumstances; and
- curtailment of non-scheduled load or the provision of unscheduled generation in response to demand for, or price of, electricity, which does not otherwise relate to the contractual arrangements referred to above (e.g. a retail tariff or known behaviour that is not the result of a contractual arrangement).

AEMO's Demand Side Participation Information Guideline, which was released in April 2017, requires Registered Participants to report annually the following information, down to a National Metering Identifier (NMI) level.

Table 4.1 Required demand side participation information

Connections and programs above 1MW in aggregate capacity	Connections and programs below 1MW in aggregate capacity
• Meter configuration, name, address and program name • Available load reduction, generation increase/storage output • What price (trigger/tariff) the response is driven by, who controls the response and what the control algorithm is, including opt out ability • DSP type (load or generation) • The type of energy storage (include storage capacity, purpose, installation date, whether export is permitted, inverter make and model) • Information about historical response and how DSP is monitored, seasonal variation • Temperature restrictions	• Whether the device is subject to time of use pricing, the wholesale spot price or pricing that depends on network operating conditions (e.g. critical peak pricing) • Whether the device can be controlled directly by the NSP • Whether it has on-site energy storage (e.g. batteries) • Whether the customer is on an alert list (e.g. prices are high, reduce demand), including how this information is distributed and whether AEMO can opt in.

4.3.4 Type of systems to be included in the register

Small scale generation

Most stakeholders expressing a view on the size of systems that should be included in the register agreed with the maximum capacity limit proposed by the COAG Energy

Council of 5MW. However, they did not generally comment on the need to establish a minimum capacity threshold.

The Commission notes that AEMO's current automatic exemption threshold for the requirement to register a generating unit under Chapter 2 of the NER as a generator is 5MW. However, this threshold can be changed at any point through a change to the NEM Generator Registration Guide. AEMO can also exempt generators larger than 5MW and smaller than 30MW on a case by case basis.

AEMO would not have any greater visibility of generators between 5MW and 30MW that were exempted than it does currently for generators less than 5MW. The same benefits would arise in having visibility over such larger, exempt generation as for generators under 5MW. Consequently, the Commission considers that AEMO should be able to require information in relation to these systems to be collected and provided by NSPs for the DER register in accordance with its guidelines (which are subject to public consultation).

To give effect to this, the draft rule links the definition of DER generation information to standing data in relation to a small generating unit. A small generating unit is defined in the NER as a generating unit with a nameplate rating of less than 30 MW and which has been exempted by AEMO from registering as a generator. Consequently, there is not a need to otherwise prescribe a maximum capacity limit in the draft rule.

The Commission notes the case for mandating a minimum capacity limit, in that such a limit could decrease the costs associated with the register by reducing the burden to report very small devices for which increased visibility would provide limited marginal benefit. Specifically, it would reduce the risk of unintentionally capturing small battery or generating systems, such as phone power packs.

However, there does not appear to be a clear rationale for any particular limit, and there would be a degree of arbitrariness to any specific threshold (e.g. 1kW). In addition, the drivers for a specific limit may change over time and, if a limit were prescribed in the NER, a rule change would then be required to amend the threshold.

Consequently, the Commission considers that the draft rule should not prescribe a minimum capacity limit. Instead, AEMO should have the flexibility to consider the need to only capture generation devices above a certain nameplate capacity when developing and consulting on the DER register information guidelines.

Behind the meter

The Commission considers that the register should not be limited to 'behind the meter' DER, but rather should capture all relevant DER within the NEM. This is because:

- DER, in aggregate, will have a similar impact on the power system regardless of whether it is 'behind the meter', 'on a retail customer's side of the connection point' or 'co-located with customer load'

- The functionality and use of the distributed energy resource is more important for power system operation and control than who owns the specific device. For example, the register should capture DER at residential and commercial premises as well as DER owned by DNSPs and TNSPs.

4.4 Commission's position

The draft rule:

- places an obligation on AEMO to establish, maintain and update a DER register that contains the following:

    1. *DER generation information* (information that NSPs must provide to AEMO in accordance with AEMO's DER register information guidelines in relation to their networks and which they are obliged to collect under the NER)

    2. information reported under the Demand Side Participation Information Guideline which in AEMO's reasonable opinion is relevant to the DER register

    3. DER information provided to AEMO from other sources, in the performance of AEMO's functions, which in AEMO's reasonable opinion will assist network service providers to meet their regulatory obligations or requirements.

- allows AEMO to use the DER register information for the purposes of the exercise of its functions under the National Electricity Law or Rules, including when performing its power system security responsibilities and obliges AEMO to take this information into account when developing or using load forecasts

- obliges AEMO to publish details, no less than annually, on the extent to which DER register information received under the rule has informed AEMO's development or use of load forecasts, or the performance of its power system security responsibilities.

The draft rule also places an obligation on AEMO to develop, maintain and publish DER register information guidelines that specify, amongst other things, the details of the DER generation information that NSPs must provide to AEMO, including any minimum size of small generating units, as well as when and how the information is to be provided.

In developing or amending the DER register information guidelines, the draft rule obliges AEMO to have regard to the reasonable costs of efficient compliance by NSPs with the guidelines compared to the likely benefits from the use of the information. AEMO is also required to consult with NSPs and other interested parties when formulating its DER register information guidelines in accordance with the Rules consultation procedures.

5 Data collection

This chapter discusses how DER register information is to be collected, and the obligations in the rules to facilitate that.

5.1 COAG Energy Council's view

The COAG Energy Council proposed that DNSPs collect information about DER at customer sites and report this to AEMO for the register.[88]

It also proposed that customers who are the owners of DER systems (or their agent) should be obliged to provide information on the DER system to their DNSP.[89] However, it did not discuss how such obligations on individual consumers would be enforced.[90]

5.2 Stakeholder views

Obligation on DNSPs to collect information

Several stakeholders indicated that the DNSPs' existing connection application process is a logical mechanism for data collection of DER.[91]

On this issue, Jemena noted that Part D of Chapter 5A of the NER sets out the connection processes and information requirement to enable a new connection or connection alteration and suggested this rule be reviewed to accommodate any new information to be collected as required by this DER register.[92]

However, Jemena noted that after the initial connection, it is difficult to monitor additions and alterations to the generator and/or battery storage equipment. NER amendments requiring customers to apply to DNSPs of additions and alterations to their generator and/or battery storage equipment would be welcomed.[93]

On the other hand, some stakeholders were not supportive of using the current DNSPs connection application process as a method for collecting DER information for the purposes of the register.[94]

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88 Rule change request, p. 3.

89 Rule change request, p. 3.

90 Rule change request, p. 12.

91 Consultation paper submissions: CitiPower, Powercor and United Energy, p. 2; S&C Electric Company, p. 7; AusNet Services, appendix A, p. 5; Clean Energy Council, p. 5; Energy Networks Australia, p. 1; Jemena, p. 1; Greensync, p. 2.

92 Jemena, submission to consultation paper, attachment 1, p. 5.

93 Jemena, submission to consultation paper, attachment 1, p. 6.

94 Consultation paper submissions: TasNetworks, p. 2; Endeavour Energy, p. 9; Ausgrid, attachment 1, p. 10; AGL, p. 2, Centre for Energy and Environmental Markets - UNSW, p. 9.

TasNetworks argued that the connection application process would be unlikely to capture all the required information, particularly with regard to any subsequent modification, upgrade, transfer or removal of DER technology.[95]

Endeavour Energy noted that the reliance on DNSPs to collect this data (connection agreement data) creates additional costs and does not align with DNSPs' main responsibilities in managing the safety, reliability and availability of the network. It argued that the costs of introducing applications and audits would create a disincentive to customers and add to resource constrains of DNSPs.[96]

Ausgrid also noted that using the connection application process for the register may become problematic if the definition of DER is broad and covers integrated energy equipment and appliances. For example, the installation of a new controllable air conditioner (if defined as a DER for the purposes of the register) would not require the submission of a connection application to a DNSP for a capacity upgrade in the majority of cases.[97]

AGL was of the view that the connection process presents a barrier for customer investments in DER, due to cumbersome and lengthy application processes and network resistance to high proliferation of DER assets.[98]

Obligations on other parties to collect information

Many stakeholders were of the view that obligations on one or more parties (i.e. electricians, installers, retailers, aggregators, etc.) would need to be considered in order for a DER register to collect a relevant amount of data.[99]

PIAC noted that this could include obligations on product retailers to collect and report information at point of sale.[100] In addition, Tasmanian Renewable Energy Alliance was of the view that it would be better to obtain detailed technical information about DER equipment from manufacturers and equipment distributors rather than at the point of installation.[101] AGL suggested that it may be more appropriate for customers to individually manage their own energy system requirements into the future, entailing a more limited role for network businesses.[102]

On this issue, AEMO suggested that any party that may have access to the DER to set or change settings should be required to update the register and that without such obligations the data set would become out of date and over time the entire purpose of

95 TasNetworks, submission to consultation paper, p. 2.

96 Endeavour Energy, submission to consultation paper, p. 9.

97 Ausgrid, submission to consultation paper, attachment 1, p. 10.

98 AGL, submission to consultation paper, p. 2.

99 Consultation paper submissions: Centre for Energy and Environment Markets - UNSW, p. 9; PIAC, attachment 1, p. 7; S&C Electric Company, p. 7;

100 PIAC, consultation paper submission, attachment 1, p. 7.

101 Tasmanian Renewable Energy Alliance, consultation paper submission, p. 1.

102 AGL, submission to consultation paper, p. 2.

the register would be undermined. This should include retailers, aggregators, embedded network operators and other market participants.[103]

Some stakeholders recommended that DER aggregators could be responsible for collecting DER information[104], while others suggested that an obligation could be placed on energy retailers,[105] adding that the energy retailers are the first point of contact with end consumers.

In addition, Ausgrid indicated that effective methods of involving installers in the regulatory process should be considered. In its view, installers are best placed and have the requisite technical knowledge needed to obtain and report on information about a new DER installation and their involvement in the process is likely to be the key factor in whether the register can achieve its intended objectives.[106]

However, some stakeholders also recognised that many of these parties do not fall under the jurisdiction of the rules.[107]

AEMO noted that, while beyond the scope of the NER, due to a lack of clarity and inconsistent state based regulatory frameworks, clear obligations on DER installers are also required to ensure they collect and submit data into the DNSPs connection processes. AEMO stated it has written to all NEM state Premiers requesting each state provide this clarity via their electrical licencing regulatory frameworks.[108]

Need for consistency across DNSPs

The vast majority of stakeholders supported a uniform approach in the data collection framework across the various network areas and jurisdictions.[109]

Energy Networks Australia (ENA) noted that the development of a set of nationally consistent DER Connection Guidelines was identified as a key priority out of the CSIRO/Energy Networks Australia *"Electricity Network Transformation Roadmap"*. According to ENA, these guidelines are being developed to help streamline the technical requirements for connecting DER across NSPs and making it easier for proponents to connect (including the specification of the information to be provided by all proponents). ENA also recommended that the detailed requirements for the collection and provision of relevant data for all future DER connected to the system be

103 AEMO, consultation paper submission, attachment 1, p. 6.

104 Consultation paper submissions: SA Power Networks, appendix A, p. 4; AER, p. 4;

105 Consultation paper submissions: S&C Electric Company, p. 3; AER, p. 3.

106 Ausgrid, submission to consultation paper, attachment 1, p. 11.

107 Consultation paper submissions: S&C Electric Company, p. 7; AEMO, attachment 1, p. 6.

108 AEMO, consultation paper submission, attachment 1, p. 6.

109 Consultation paper submissions: S&C Electric Company, p. 7; AEMO, attachment 1, p. 5; SA Power Networks, attachment 1, p. 4; AusNet Services, appendix A, p. 5; Formbay, attachment 1, p. 4; Tasmanian Renewable Energy Alliance, p. 3; Jemena, attachment 1, p. 5; Clean Energy Council p. 5; PIAC, attachment 1, p. 6; Ausgrid, attachment 1, p. 9; Centre for Energy and Environmental Markets - UNSW, p. 9; Dr Penelope Crossley - University of Sydney Law School, p. 5.

included as a requirement of the new National DER Connection Guidelines, in order to ensure alignment of information collection with DNSPs' connection agreements.[110]

S&C Electric Company made similar observations, noting that ENA is currently developing nationally consistent connection criteria, so collection of data for the register needs to link up with the technical guidelines for the ENA process.[111]

A contrasting view was provided by TasNetworks, which partially supported the harmonisation of the information collected across network regions where possible, noting that in those cases where there are clear benefits for collecting information of a type in one jurisdiction that is not relevant in another, collection guidelines should provide sufficient flexibility to allow this to occur.[112] Endeavour Energy also argued that consistency across regions is not as relevant to DNSPs as it is for AEMO.[113]

5.3 Analysis

While DNSPs collect some data on DER via connection agreements, there is currently no obligation under the NER for DNSPs to collect and share specific technical data about DER systems as proposed in the rule change request.[114]

There are currently two avenues under the rules for DNSPs to obtain information from retail customers (or their agents) about distributed generation:

(a) the connection application process, which is prescribed under Chapter 5A of the NER

(b) the model terms and conditions for deemed standard connection contracts in the NERR, Schedule 2.

Obligations on DNSPs to collect information

Box 5.1 below details the current arrangements in the NER about the application process that customers need to follow when applying for a connection service.

110 Energy Networks Australia, submission to consultation paper, pp. 1-2.

111 S&C Electric Company, submission to consultation paper, p. 7.

112 TasNetworks, submission to consultation paper, p. 5.

113 Endeavour Energy, submission to consultation paper, p. 9.

114 Rule change request, p. 5.

Box 5.1 Connection application process

Under the NER (rule 5A.D.3):

- An application for a connection service may be made by (among others):
  - a retail customer for whom the connection service is sought; or
  - a retailer or other person acting on behalf of a retail customer.
- An application for a connection service must be in the appropriate form determined by the *Distribution Network Service Provider*.
- A *connection service* means either or both of the following:
  - a service relating to a new connection for premises;
  - a service relating to a *connection alteration*[115] for premises,

  but, to avoid doubt, does not include a service of providing, installing or maintaining a metering installation for premises.

The Commission understands concerns were raised during consultation about the current connection application process, including:

- inconsistency across networks in terms of level of technical requirements, documentation requirements and structure of documents
- lack of clarity with respect to technical and documentation requirements
- uncertainty regarding what is required to be done where new load or generation is added to an existing connection.

Box 5.2 provides an overview of the current arrangements in the NERR about the existing obligations on retail customers that are relevant to DER information data collection.

115 Connection alteration means an alteration to an existing connection including an addition, upgrade, extension, expansion, augmentation or any other kind of alteration. (rule 5A.A.1)

Box 5.2 Model terms and conditions for deemed standard connection contracts

Under the Model terms and conditions for deemed standard connection contracts[116], retail customers are also required to inform the DNSP of the following:

Clause 6.2 Updating information

You must promptly:

...

(c) inform us of any proposed change that you are aware of in plant or equipment, including metering equipment, or any change to the capacity or operation of connected plant or equipment that may affect the quality, reliability, safety or metering of the supply of energy to the premises or the premises of any other person; and

(d) inform either your retailer or us of any permanent material change to the energy load or pattern of usage at the premises.

Clause 6.6 Small generators including solar panels

(a) If you have a small generator connected to our distribution system at the premises, you must comply with the applicable standards in operating and maintaining the generator when you start to take supply of energy under this contract.

(b) If you no longer want to keep a small generator at the premises connected to our distribution system, you must apply to us for a connection alteration so that any necessary alterations to the connection can be made.

(c) If you want to connect a small generator at the premises to our distribution system for the purpose of exporting energy (for example, a solar panel), you must apply for a connection alteration under the *National Electricity Rules*. We will provide you with a copy of the relevant additional terms and conditions at the time when we make our connection offer.

As noted in Chapter 3, DNSPs have an incentive to collect DER data as they are one of the key beneficiaries of improved information, which will enable them to:

- improve forecasting of long term demand to assist with network planning
- improve forecasting of short term energy flows to assist with network operation

116 Which apply except in the case of large customers or an AER approved standard connection contract or large or small customers on a negotiated connection contract.

- identify opportunities of non-network options to defer or avoid network investment (such as demand management).

While the Commission recognises that, while there are concerns regarding the effectiveness of the two mechanisms that DNSPs use to obtain information about DER devices, making use of existing processes to leverage the data collection of DER for the purposes of the register is expected to be more cost efficient than other alternatives, such as the introduction of new obligations or processes. As noted by some stakeholders, DNSPs, through the network connection process and deemed standard connection contract, are best placed to facilitate data collection and provide it to AEMO.

A few stakeholders indicated that, even though the existing connection application process covers new connections, upgrades to load capacity for existing connections, and applications for embedded generators (including micro embedded generators), it is difficult to monitor additions and alterations to the generator and/or battery storage equipment after the initial connection.[117] Jemena encouraged NER amendments requiring customers to apply to DNSPs of additions and alterations to their generator and/or battery storage equipment.[118]

As explained above, a connection alteration is part of the definition of connection service, and should already be captured through the existing Application of Connection Service. However, the Commission is making changes to Chapters 5 and 5A of the NER to clarify that information to be provided to DNSPs includes the DER generation information the DNSPs require as detailed in the DER register information guideline.

The Commission is not making any changes to the NERR because the wording of the model terms and conditions in Schedule 2 to the NERR is sufficiently broad to capture DER register information.

Obligations on other parties to collect information

The consultation paper suggested that obligations on parties other than DNSPs may need to be considered in order for a DER register to collect a sufficient amount of data.

A wide range of parties hold information on installations of DER including: battery or inverter manufacturers; equipment retailers; installers; solar and battery system designers, registered small generator aggregators; embedded network service providers; DNSPs; metering coordinators; energy retailers; customers; safety regulators; electricians and the Clean Energy Regulator.

However, even though each of these parties could potentially assist in collecting and reporting data; their ability to provide the data and the cost of reporting would vary. It is important to note that placing enforceable obligations on some of these parties is not

117 Consultation paper submissions: Ausgrid, attachment 1, p. 10; Jemena, attachment 1, p. 5, CitiPower, Powercor and United Energy, p. 1.

118 Jemena, submission to consultation paper, attachment 1, p. 5.

possible under the NER or NERR and would require changes to the national energy laws or jurisdictional legislation.

The Commission is also of the view that placing obligations on a number of different parties to collect information is likely to result in duplication of data and unnecessary costs. For that reason, the Commission is of the view that no additional or modified obligations should be placed on customers or parties other than DNSPs in the draft rule.

Need for consistency across DNSPs

As noted previously, Energy Networks Australia and its members are currently developing a *National DER Connection Guideline* which will outline a set of nationally consistent technical information requirements for ranges of embedded generation equipment up to 5MVA. It is expected that the guidelines will make the data collection process easier and more streamlined. The guideline is expected to be available by November 2018.

The Commission welcomes the ENA initiative of developing a *National DER Connection Guideline* and agrees with stakeholders that having a national uniform approach for connection applications would facilitate the collection of DER information.

Obligations on TNSPs to collect information

Although the rule change request refers to distributed energy resources, AEMO is unlikely to have any more visibility over unregistered generators connected to transmission networks than it is those connected to distribution networks.

The Commission therefore considers that the same rationale applies to resources connected to transmission networks as to those connected to distribution networks, and the draft rule provides for this. In particular, the draft rule amends clause 5.3.3 of the NER, which addresses 'Response to connection enquiry' and applies to both transmission and distribution networks.

The Commission recognises that there are unlikely to be many unregistered generators connected to TNSP networks, and because TNSPs are likely to be aware of all generators connected to their networks, there are unlikely to be the same issues with data collection as experienced by DNSPs.

Consequently, the issues discussed in this chapter focus on DNSPs data collection mechanisms.

5.4 Commission's position

The draft rule:

- Includes an ongoing obligation on NSPs to provide DER generation information to AEMO (in accordance with AEMO's DER register information guidelines) in relation to connection points on their network which they have collected under the NER (including the connection application process and deemed standard connection contract requirements). A transitional rule requires NSPs to provide AEMO with any existing DER generation information they currently hold.
- Amends the rules relating to connection to clarify that information to be provided to AEMO includes the DER generation information the NSPs require as detailed in the DER register information guideline.

6 Compliance

This chapter addresses the following issues:

- the level of compliance needed for the benefits of the register to manifest, and if such level of compliance is likely to be achieved
- the appropriate methods to achieve an efficient level of compliance with the draft rule.

6.1 COAG Energy Council's view

As noted in Chapter 5, the COAG Energy Council proposed that DNSPs should collect information about DER at customer sites and report this to AEMO for the register. It also put forward potential steps for consideration that could support the collection of this information and address some of the current limitations in DNSPs' connection application process identified above, including:[119]

- "amending the Rules around connection agreements to clarify the situations when customers and their agents / suppliers (such as a retailer and/or an installer/ electrician) need to inform their DNSP about changes at their sites, including DER installations"
- DNSPs applying "random auditing protocols on premises / DER systems, and referral to the appropriate body for enforcement where non-compliance is identified"
- changes to the NERR "relating to the relationship between distributors, retailers and customers, and deemed standard connection contracts"
- a mechanism or obligations on other parties so that "any changes to DER post installation are captured, such as potential system changes by retailers or aggregators".

The COAG Energy Council further noted that many compliance related measures may "fall outside the rule making powers of the AEMC and will need to be considered separately in related work streams being considered by governments".[120]

119 Rule change request, p. 12.

120 Rule change request, p. 12.

6.2 Stakeholder views

6.2.1 Required levels of compliance

Some stakeholders were of the view that high levels of compliance would be required in order for the benefits of the register to materialise and outweigh the costs and administrative burden related to it.[121]

Ausgrid suggested that to ensure that the establishment of the register is in the long term interests of customers, a robust cost benefit analysis (CBA) should be conducted which builds on the CBA already conducted by Jacobs but looks extensively at the likely levels of compliance and data quality.[122]

The Tasmanian Renewable Energy Alliance added that unless a high level of compliance is achieved (over 80%) the information would not be regarded as reliable and would not form an agreed basis for planning.[123]

A contrasting view was provided by Jemena, AEMO and the Clean Energy Council, where they stated that even though high levels of compliance are desirable, partial information would still provide significant beneficial insights for demand forecasting and network reliability and security.[124] Jemena went on to add that partial information would still provide a level of understanding about how DERs respond to network disturbances, which would improve load modelling even if only applied at a broader level.[125]

On this issue, AEMO stated that in order to maximise the benefit of incomplete data while the register evolves, AEMO would look to combine the information with other data, such as metering data, and use back-casting and sampling techniques (as is applied with distributed solar).[126]

6.2.2 Improving compliance levels

The AEMC inquired in the consultation paper about potential ways of improving compliance levels.

Stakeholders provided a wide range of views, with the majority agreeing that compliance levels could be improved through the combination of various approaches, as detailed below. PIAC for example encouraged exploring how compliance could be

121 Consultation paper submissions: Ausgrid, attachment 1, p. 12; AER, p. 3 ; Endeavour Energy, p. 10; Dr Penelope Crossley - University of Sydney Law School, p. 5.

122 Ausgrid, submission to consultation paper, attachment 1, p. 12.

123 Tasmanian Renewable Energy Alliance, submission to consultation paper, p. 4.

124 Consultation paper submissions: Jemena, p. 7; AEMO, p. 2; Clean Energy Council, p. 6.

125 Jemena, submission to consultation paper, p. 7.

126 AEMO, submission to consultation paper, p. 2.

improved through education, communication, ease of reporting, incentives or penalties.[127]

Accreditation and training regime

Several stakeholders suggested that an installer accreditation program could be an invaluable tool in enforcing compliance with the DNSPs connection application process.[128]

In particular, ENA suggested that an appropriate representative industry association could run an accreditation process that could be included within the Electrotechnology National Training package (UEE11)[129]. DER installers would potentially lose accreditation if they do not correctly follow the DNSP connection processes as articulated in the training.[130]

Ausgrid and Greensync indicated the Clean Energy Council installer accreditation scheme as a suitable example of an accreditation program.[131]

Jemena added that improved training and licensing of installers of DER systems developed and administered by the jurisdictional safety regulators would raise awareness and educate relevant parties on the importance of data reporting.[132]

Jurisdictional safety regulators

Endeavour Energy and Jemena[133] noted that compliance levels could be increased by combining the required submission of data to be mandated to installers with responsibility for the installation and liabilities with the works as currently exists with the certificate of compliance for electrical work (CCEW)[134]. Jemena added that safety regulators can play an important role, through their licensing/authorisation powers, in the enforcement of data reporting.[135]

127 PIAC, submission to consultation paper, attachment 1, pp. 6-7.

128 Consultation paper submissions: Ausgrid, attachment 1, p. 12; AusNet Services, appendix A, p. 5; Energy Networks Australia, p. 2; Greensync, p. 3; Jemena, attachment 1, p. 5; AEMO, attachment 1, p. 6; S&C Electric Company, p. 2.

129 See https://training.gov.au/training/details/uee11 accessed on 25 May 2018.

130 Energy Networks Australia, submission to consultation paper, p. 2.

131 Consultation paper submissions: Ausgrid, attachment 1, p. 12; Greensync, p. 3.

132 Jemena, submission to consultation paper, attachment 1, p. 5.

133 Consultation paper submissions: Endeavour Energy, p. 10; Jemena, attachment 1, p. 5.

134 In NSW, electricians must submit a Certificate of Compliance for electrical work (CCEW) under the *Electricity (Consumer Safety) Act 2004* and *Electricity (Consumer Safety) Regulation 2015*. Electricians must provide a completed CCEW to NSW Fair Trading, within 7 days of completing any safety and compliance test, on an electrical installation.

135 Jemena, submission to consultation paper, attachment 1, p.6.

AEMO also supported state based reforms placing a clear obligation on installers to submit DER data into the register along with an enforcement regime.[136]

Ausgrid acknowledged that even though there may be legal limitations to the AEMC establishing effective regulatory methods for involving installers in the provision of information, it encouraged the AEMC to consider alternatives to its specific rule making authority that can establish effective methods for involving installers. This could include the drafting of a model law or regulation which the AEMC coordinates the passage of through each jurisdiction in the NEM.[137]

Random auditing protocols

DNSPs were generally against the COAG Energy Council's proposal that DNSPs apply random auditing protocols on premises / DER systems to support the collection of information on DER.[138] Jemena noted it has no authority to report non-compliance and cannot enforce remedial actions.[139]

AusNet Services added that the costs assigned to DNSPs' random auditing protocols do not appear to adequately cover an ongoing statistically significant audit program across the NEM and suggested that a more cost efficient alternatives to random audits should be considered, such as advanced data analytics of interval metering data.[140]

TasNetworks argued that even though performing some form of household DER audit might pick up all the relevant information, it would be administratively onerous and likely lead to data that is increasingly inaccurate as the passage of time between audits grew.[141]

136 AEMO, submission to consultation paper, attachment 1, p. 6.

137 Ausgrid, submission to consultation paper, attachment 1, p. 12.

138 Consultation paper submissions: Jemena, p. 1; AusNet Services, attachment p. 3; Endeavour Energy, p. 6; TasNetworks, p. 5.

139 Jemena, submission to consultation paper, p. 1.

140 AusNet Services, submission to consultation paper, appendix A, p. 3.

141 TasNetworks, submission to consultation paper, p. 5.

Penalties and incentives

Several stakeholders suggested a mixed approach of penalties and incentives.[142]

Greensync added that the value streams emanating from markets (like deX[143]) are ideal 'carrots' for both new DER deployment and historic updates.[144]

The Centre for Energy and Environmental Markets - UNSW proposed that an alternative option would be to require participation in the DER register as a pre-requisite to participating in any future distribution markets (as set out in the Distribution Market Model final report).[145]

Dr Martin Gill contended that while financial incentives could be used to increase reporting levels, these incentive payments were not included in the financial analysis supporting the rule change.[146]

Achieving compliance in the future

Some stakeholders also shared their views on how compliance could be maintained over time, considering technology changes.

AEMO noted that the regulatory framework requires sufficient flexibility, so that it can, in close consultation with industry, update the register's implementation guideline as necessary so as to capture new technologies or data streams.[147]

The Clean Energy Council argued that monitoring the behaviour of DER is likely to be simpler over time as control and communication systems improve and as market rules are reformed to enable DER systems to participate in markets. Linking registration to incentives (such as the ability to participate in markets) is also likely to be more successful than relying on a blunt enforcement approach.[148]

Formbay was of the view that the provision and monitoring of minimum standards coupled with effective communication and industry engagement would provide the basis of ongoing change implementation.[149]

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142 Consultation paper submissions: AusNet Services, appendix A, p. 5; Dr Penelope Crossley - University of Sydney Law School, p. 5; Greensync, p. 2; Energy Networks Australia, p. 2, Tasmanian Renewable Energy Alliance, p. 1.

143 deX stands for Descentralised Energy Exchange, an open exchange developed by Greensync where energy capacity can be transacted between businesses, households, communities and utilities. According to Greensync, deX brings DERs online to deX participants, making them visible in the network and dispatchable when required. Agreements can be formed and capacity from DERs can be aggregated. See https://dex.energy/faqs/ accessed on 25 May 2018.

144 Greensync, submission to consultation paper, p. 2.

145 Centre for Energy and Environmental Markets - UNSW, submission to consultation paper, p. 9.

146 Dr Martin Gill, submission to consultation paper, p. 2.

147 AEMO, submission to consultation paper, attachment 1, p. 6.

148 Clean Energy Council, submission to consultation paper, p. 6.

149 Formbay, submission to consultation paper, attachment 1, p. 6.

6.3 Analysis

The benefits of a DER register will be more likely to manifest if the data is accurate and current. Stakeholders are unified in the view that a major hurdle will be ensuring reporting levels are adequate, if not complete.

The Commission recognises that the register is unlikely to achieve a compliance level of 100 per cent, based on current connection reporting levels and expected future reporting levels.

6.3.1 Addressing limitations in data collection and compliance

Accreditation and training regimes

Many stakeholders supported either linkages to existing accreditation schemes (such as the one led by the Clean Energy Council for solar PV installations[150]) or establishing a new industry-led accreditation scheme.

The COAG Energy Council and other stakeholders were also in favour of other industry-led measures, such as targeted awareness and education programs for installers and electricians.

Even though the Commission is not in favour of mandating an accreditation scheme through the NER (due to the costs associated), it is supportive of an industry-led initiative.

Jurisdictional safety regulators

As discussed in Chapter 8, the regulation of electrical safety matters falls within the remit of jurisdictional departments or jurisdictional safety regulators in each state and territory.

The COAG Energy Council suggested that jurisdictions could use electricity safety regulations and licensing to improve data collection rates by DER installers and electricians.[151]

Jacobs' CBA report noted that jurisdictional electrical safety regulations require installers to provide a certificate of completion of their electrical work at a property.[152]

In NSW, for example, electricians have to provide a completed Certificate of Compliance for Electrical Work (CCEW) to NSW Fair Trading, within 7 days of completing any safety and compliance test, on an electrical installation.[153] A copy of the CCEW form also needs to be submitted to the consumer, the electricity network

150 See https://www.solaraccreditation.com.au/

151 Rule change request, p. 12.

152 Jacobs, Cost benefit analysis of options to collect and share information about small scale battery storage, final CBA report, June 2017, p. 34.

153 See *Electricity (Consumer Safety) Act 2004* and *Electricity (Consumer Safety) Regulation 2015*.

provider and the energy provider (meter retailer). Similar requirements apply in other jurisdictions.

The findings of Jacobs' cost benefit analysis report briefly evaluated the expansion of electrical safety licence conditions as an alternative data collection mechanism; however the findings suggested there would be significant complexity in implementing this option as regulatory changes would be required across all jurisdictions and some form of standardisation would be required.[154] Jacobs indicated that this would be a costly exercise and result in significant time delays due to resultant legislative changes.

As noted previously, stakeholders (including AEMO, Endeavour Energy, Ausgrid and Jemena) indicated that state based safety regulators could play an important role through their licensing/authorisation powers in ensuring installers of DER systems provide the requisite information to the distribution businesses. AEMO noted in its submission that it has written to all NEM state Premiers requesting each state provide clarity via their electrical licencing regulatory frameworks to enhance compliance with data collection through DNSPs connection processes.[155]

The Commission understands that several jurisdictions (VIC, SA and NSW) have informally indicated a willingness to use a light-handed approach, e.g. by amending the data fields collected under the electrical safety certificates for use in validating information in the DER register.

The Commission cannot place obligations in the NER on jurisdictional safety regulators. However, the Commission considers that electrical safety compliance certificates could be a useful mechanism to collect relevant DER information. As noted above, in many jurisdictions a copy of these certificates is already provided to DNSPs, which could then use this information to verify the accuracy of the data collected through their own existing mechanisms (i.e. connection application processes or deemed standard connection contract).

Therefore, the Commission recommends that state safety regulators investigate how existing compliance mechanisms could be used to improve submission of appropriate DER information to DNSPs, including whether it is appropriate to amend the data fields collected under electrical safety certificates. This data might also be shared directly with AEMO if all parties consider it appropriate.

Random audits performed by DNSPs

In the rule change request, the COAG Energy Council suggested that DNSPs could apply random auditing protocols on customer premises and refer non-compliant customers to the appropriate body (AER) for enforcement.

154 Jacobs, *Cost benefit analysis of options to collect and share information about small scale battery storage*, final CBA report, June 2017, p. 34.

155 AEMO, submission to consultation paper, attachment 1, p. 6.

Most stakeholders were strongly opposed to this proposal, citing the significant costs that would be involved with this approach. The Commission considers that the costs of carrying random audits would be significant and is not in favour of including a requirement for DNSPs to audit households in the NER.

Achieving compliance in the future

The Commission recognises that future changes in technology could influence compliance with reporting obligations.

For example, batteries may be able to be detected from smart meter data and monitoring devices on inverters may be able to automatically report data. This would make the task of compliance easier.

As discussed in Chapter 4, the Commission is of the view that the proposed governance framework is flexible enough to adapt to future technology changes.

6.3.2 Enforcement

The Australian Energy Regulator (AER) noted that the enforcement actions available to it include: issuing infringement notices; accepting voluntary or court enforceable undertakings; and instituting proceedings. The rule change request proposes that the owners of DER should be obliged to provide information on their DER system to their DNSP. Among other things, the AER's enforcement tools are better adapted to less frequent but more significant breaches than high numbers of breaches with a lower impact. If the new rules were made, it would be more appropriate to design an incentive regime to encourage compliance, rather than imposing a direct obligation.[156]

The AER considers that monitoring compliance and taking enforcement action against individual customers or installers would place a heavy burden on its resources. In particular, it noted that its existing enforcement tools are better adapted to less frequent but more significant breaches.[157]

The AER suggested that AEMO could be responsible for undertaking compliance of DER installers. This could align with the role AEMO currently has in monitoring metering compliance.[158]

AEMO is responsible for managing the accreditation of metering parties (i.e. Metering Coordinators, Metering Data Providers and Metering Providers) under the NER.[159] It is also empowered to undertake a range of enforcement measures against these parties, including deregistration and suspension. In addition, it carries out periodic metering audits and reviews within the NEM.

156 AER, submission to consultation paper, pp. 2-3.

157 AER, submission to consultation paper, p. 3.

158 AER, submission to consultation paper, p. 3.

159 See section 7.4 of the NER.

The Commission does not consider that a similar compliance and enforcement regime should be established by AEMO for DER installers:

- AEMO monitors a relatively small number of metering parties that have significant obligations under the NER. In contrast, there is a very large number of DER installers who currently do not have any obligations under the NER. We consider that establishing an AEMO-led accreditation regime for DER installers would be unsuitable and would be prohibitively costly.

- The deregistration abilities that AEMO possesses for metering parties is appropriate because it can identify individual failures of compliance. It is able to identify these failures in large part because it undertakes compliance audits and reviews of metering installations.

- We do not consider that it is appropriate for AEMO to undertake audits of DER installations at customer premises. This is because the DER installation is often owned by the retail customer and installed inside their dwelling. Undertaking an audit of DER installations would be more invasive and cumbersome than it is for meters.

6.4 Commission's position

As noted previously, several stakeholders noted that the DER register would still provide significant benefits even with low levels of compliance.[160]

The Commission considers that a high level of compliance is likely to be difficult to achieve. However, it agrees that establishing a DER register and placing obligations on NSPs in the NER to collect the information will create an opportunity for NSPs to work with installers and customers in their network area to significantly improve compliance with existing data submission requirements. Some stakeholders were also of the view that clearer requirements would improve awareness and reporting rates.[161]

The Commission is of the view that establishing a DER register in the NER will provide a basis for other entities (such as jurisdictional regulators, as well as industry bodies) to require or encourage submission of the appropriate data to NSPs by installers on behalf of customers. In that sense, the Commission recommends that state safety regulators investigate how existing compliance mechanisms could be used to improve submission of appropriate data on DER to NSPs (e.g. whether it is appropriate to amend the data collected under electrical safety certificates for use by NSPs).

160 Consultation paper submissions: AEMO, p. 2; Clean Energy Council, p. 6; Jemena, attachment 1, p. 6.

161 Consultation paper submissions: AusNet Services, appendix A, p. 5; Jemena, attachment 1, p. 6.

7 Data sharing

This chapter discusses the proposal to share information from the DER register with third parties, AEMO's current abilities to share data and the potential privacy concerns that may arise with the sharing of information.

7.1 COAG Energy Council's view

7.1.1 Sharing data with third parties

The rule change request seeks to allow AEMO to share information in a DER register with third parties, subject to existing privacy laws. These parties were listed as including both registered participants, such as DNSPs and retailers, and a range of other parties.

The COAG Energy Council proposed that where parties can use the data in the DER register to provide benefits to customers, such as more efficient market and network operation or improved safety, this would justify access to data at an appropriate level of aggregation and anonymity.[162]

In particular, the COAG Energy Council has suggested a list of stakeholders who could benefit from access to the DER register which includes:[163]

- network service providers, where disaggregated data would improve networks planning, investment and operation
- emergency services, where data could assist with effective responses to emergency events on sites with a battery storage device or other DER
- public sector bodies, where aggregated data could lead to more informed policy decisions and improved market and network efficiency
- private sector entities, where data could promote innovation and make it easier to conduct DER product recalls.

7.1.2 Privacy concerns

The rule change request also noted that another important consideration may be the collection, use and disclosure of 'personal information'[164] under the *Privacy Act 1988*, to which AEMO is also subject.[165]

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162 Rule change request, pp. 11-12.

163 Rule change request, pp. 2, 17-18.

164 'Personal information' means information or an opinion about an identified individual, or an individual who is reasonably identifiable: a) whether the information or opinion is true or not, and; b) whether the information or opinion is recorded in a material form or not.

The COAG Energy Council noted that some of the information that may be collected, used and disclosed by AEMO for the purposes of the register could constitute personal information within the meaning of the Privacy Act (e.g. a retail customer's name, address or phone number).

However, the COAG Energy Council was of the view that the Australian Privacy Principles (APPs) would not prevent the implementation of the DER register as proposed.

7.2 Stakeholder views

7.2.1 Sharing data with third parties

Sharing data with NSPs

Energy Networks Australia recommended that the AEMC consider ensuring any rule change include provisions for NSPs to have access to information in the DER register, to enable them to undertake their network operation and network planning functions in the most cost-effective and efficient manner.[166]

Transgrid made similar observations, noting that the proposed rule would have significantly greater benefits if it was amended to allow transmission network service providers (TNSPs) to have access to the information in the DER register.[167]

From a procedural perspective, AusNet Services noted that distribution businesses would benefit from correlating information in the DER register obtained from other sources with information provided to DNSPs from connection agreements and contracts. In this way, the DER register would become another valuable avenue for DNSPs to gain visibility over the DER on their networks.[168]

Sharing data with a wider audience

It was widely considered by stakeholders that AEMO should be able to make aggregated/anonymised data available to a wider range of parties.[169] Energy Queensland noted that sharing aggregated data with academia and other parties could bring market development benefits without impacting on privacy rights of individuals.[170]

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165 Rule change request, pp. 9-10.

166 Energy Networks Australia, submission to consultation paper, pp. 2-3.

167 Transgrid, submission to consultation paper, p. 1.

168 AusNet Services, submission to consultation paper, Appendix A, p. 2.

169 Consultation paper submissions: Energy Queensland, p. 14; PIAC, pp. 1, attachment 1, p. 9-10; Tasmanian Renewable Energy Alliance, p. 1; Centre for Energy and Environmental Markets - UNSW, p. 11; S&C Electric, p. 4; Ausgrid, attachment 1, p. 4.

170 Energy Queensland, submission to consultation paper, p. 14.

The Centre for Energy and Environmental Markets (UNSW) and the Tasmanian Renewable Energy Alliance reasoned that the Clean Energy Regulator public periodic release of PV installation data by postcode and system size strikes a good balance between granularity for policy purposes and protection of privacy of individual installations.[171]

EnergyAustralia, on the other hand, indicated that it did not see a need to limit access to the data for retailers or other parties as this may limit its benefits or complicate the process of keeping the data current.[172]

Consumer consent required

Many stakeholders were of the view that access to third parties should only be provided where explicit informed consent has been provided by the consumer.[173]

AGL added that customers should be notified of the data they are sharing and be able to revoke access easily.[174] Dr Penelope Crossley suggested that an opt-in system could be used for customers that agree in sharing their data with third parties.[175]

CitiPower, Powercor and United Energy noted that in their view the highest benefit of the DER register is the potential participation of DER owners in demand management. As such, they proposed that DNSPs should be able to use information in the register to contact consumers for potential demand management solutions, subject to DER owners giving consent to be contacted for such purposes at the time of registering their DER or when updating their information.[176]

Competition concerns

Stakeholders had different views if competition concerns could arise from establishing the DER register.

Energy Queensland was of the view that sharing data widely with third parties could bring the potential for exploitation of private information for commercial benefit. In its view, if anything other than aggregated/anonymised data was made available to market participants, sensitive information could be used and result in predatory sales tactics or pressure on unsuspecting customers by installers and technology providers, and potentially unfair changes to pricing.[177]

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171 Consultation paper submissions: Centre for Energy and Environmental Markets - UNSW, p. 11; Tasmanian Renewable Energy Alliance, p. 1.

172 EnergyAustralia, submission to consultation paper, p. 3.

173 Consultation paper submissions: AGL, p. 6; CitiPower, Powercor and United Energy, p. 2; Dr Penelope Crossley, University of Sydney Law School, p. 7; EnergyAustralia, p. 3; PIAC, attachment 1, p. 8.

174 AGL, submission to consultation paper, p. 6.

175 Dr Penelope Crossley, University of Sydney Law School, p. 6.

176 CitiPower, Powercor and United Energy, submission to consultation paper, p. 2.

177 Energy Queensland, submission to consultation paper, p. 13.

The Centre for Energy and Environmental Markets (UNSW) added that access to the DER register data by retailers or insurance companies could potentially lead to market abuse.[178]

On the other hand, some stakeholders stated they were not apprehensive about specific competition concerns.[179]

In addition, Ausgrid and Jemena were of the view that the AEMC should seek expert advice on whether the information collected would not give rise to any competition concerns.[180] Jemena added that any potential impacts on competition in markets for new energy services associated with the establishment of the register should be investigated further. This should include whether existing energy retailers may be able to confer an advantage over some competitors by accessing and using information from a DER register to promote products outside their traditional energy retail business, whilst competitors in new energy service markets who are not energy retailers would not have access to the same information.[181]

7.2.2 Privacy concerns

Various stakeholders were of the view that the existing regulatory arrangements are sufficient to deal with privacy concerns.[182]

AEMO suggested it is highly considerate of privacy concerns and supports safeguards of customer information. This should occur to the extent AEMO and DNSPs are not compromised in their ability to collect and utilise the information required to forecast, operate the power system and maintain security of supply, for the benefit of customers.[183]

Deakin University noted that a simple, static register that only lists minimal information about the DER is likely to be both compliant and manageable within current provisions. However, it added that a dynamic, complex register will need further consideration.[184]

A contrasting view was provided by Red Energy and Lumo Energy, who warned that any mechanism that might provide other market participants access to their customers

178 Consultation paper submissions: Centre for Energy and Environmental Markets - UNSW

179 Consultation paper submissions: AusNet Services, appendix A, p. 6; Formbay, attachment 1, p. 7; Dr Penelope Crossley - University of Sydney Law School, p. 7.

180 Consultation paper submissions: Ausgrid, attachment 1, p. 13; Jemena, attachment 1, p. 7.

181 Jemena, submission to consultation paper, attachment 1, p. 7.

182 Consultation paper submissions: AEMO, attachment 1, p. 7 ; Ausgrid, attachment 1, p. 13 ; Deakin University, attachment 1, p. 6; Formbay, attachment 1, p. 6; TasNetworks, p. 6.

183 AEMO, submission to consultation paper, attachment 1, p. 7.

184 Deakin University, submission to consultation paper, attachment 1, p. 7.

data without their permission. The level of data requested in the rule change proposal is significant, and given this, the risk of it being used improperly is high.[185]

Open Banking Review and proposed Consumer Data Right

Some stakeholders[186] flagged that data sharing and privacy issues are being dealt with extensively and in great detail through the *Open Banking Review*[187] and the processes to implement the *Consumer Data Right*[188] in the energy sector.[189]

The Clean Energy Council added that the AEMC should await the recommendations of those processes rather than running an overlapping consultation process that could confuse matters.[190]

AEMO strongly favoured one, consistent access framework for the DER register and broader standing and meter data by third party providers. AEMO encourages the AEMC to have regard to this work in considering privacy and third-party access matters.[191]

7.2.3 Cost recovery mechanism

A few stakeholders addressed the issue of cost recovery of the DER register implementation and operation in their submissions.[192] TasNetworks advocated that "cost-recovery and proportionality in revenue sharing arising from the operation of the register must be key principles guiding its implementation".[193]

PIAC reasoned that cost recovery arrangements that smear the costs of the DER across the market are unlikely to place materially regressive costs on disadvantaged and vulnerable consumers. Nonetheless, considering the broader social and environment benefits of the DER and the use of DER data for parties external to the energy market, PIAC asked the AEMC to consider ways that the DER could be funded in whole or part through consolidated revenue.[194]

AGL noted, however, that the Jacobs study excluded consideration of funding options for the collection of data, development of the database and operation of the database,

185 Red Energy and Lumo Energy, submission to consultation paper, p. 2.

186 Consultation paper submissions: Clean Energy Council, p. 7; AEMO, p. 3; AGL, p. 5.

187 The Australian Government the Treasury, *Review into open banking*, December 2017.

188 The Consumer Data Right was one of 41 recommendations from the Productivity Commission's Data Availability and Use Inquiry, tabled in parliament in May 2017.

189 The COAG Energy Council released a draft report considering how best to facilitate timely access to consumption data by third party service providers. *Facilitating Access to Consumer Energy Data*, March 2018.

190 Clean Energy Council, submission to consultation paper, p. 7.

191 AEMO, submission to consultation paper, p. 3.

192 Consultation paper submissions: TasNetworks, p. 2; AGL, p. 5; PIAC, attachment 1, p. 4.

193 TasNetworks, submission to consultation paper, p. 2.

194 PIAC, submission to consultation paper, attachment 1, p. 4.

as well as cost recovery options. In their view, it is essential that costs and funding options be aligned with those stakeholders primarily benefiting from its establishment.[195]

7.3 Analysis

The rule change proposal seeks to more explicitly provide for the transfer of data from DNSPs to AEMO and vice versa, and between AEMO and other parties, some of which may be Registered Participants and some of which may be not.[196] Access needs to the DER register will vary. Some parties may need access to site specific information, while others could have access to more aggregated information, which could support market and policy development.[197]

7.3.1 AEMO's current ability to share data

The protected information provisions (set out in Part 5, Division 6 of the NEL) require AEMO to take all reasonable measures to protect protected information[198] from unauthorised use or disclosure.

In the context of this rule change request, such information could include:

- information on distributed generation provided to AEMO by NSPs
- information on demand side participation that AEMO has included in the DER register and that was obtained from Registered Participants under the DSP Information Guidelines
- information obtained from other sources, such as from the CER under the Small-scale Renewable Energy Scheme.

However, the following exemptions to the above restrictions apply, amongst others:

- Section 54F – AEMO can disclose protected information if it does not disclose any elements that could lead to the identification of the person to whom the information relates; or the manner in which it discloses does not identify the person to whom that information relates.
- Section 54FA – AEMO can disclose information that was given to it in confidence in aggregated form.

195 AGL, submission to consultation paper, p. 5.

196 Rule change request, p. 11.

197 Rule change request, p. 9.

198 Protected information is information given to AEMO in confidence or in connection with the performance of its statutory functions and classified under the NER or the regulations as confidential information.

7.3.2 Sharing data with third parties

Sharing (disaggregated) data with NSPs

Distribution and transmission businesses have indicated that they would find it useful to gain access to the information contained in the DER register that relates to their operations area.

As noted in Chapter 3, a primary objective of the DER register is to improve network planning, investment and operation. The Commission considers that these benefits will be more likely to manifest if distribution and transmission businesses are able to learn about the location of DER devices in their network areas that were not reported through their connection processes or contracts.

There is currently no formalised data sharing arrangement under the DSP rule in the NER or under AEMO's DSP information guideline that supports AEMO to share demand side participation information with third parties.

The Commission considers that AEMO should include in the DER register relevant information that it has obtained under the Demand Side Participation Information rules and guideline and any other relevant and credible DER information that has been provided to AEMO by any other person in the performance of AEMO's functions has access to from other sources (e.g. solar panels from the Clean Energy Regulator). This is in order to create a more complete database of DER that external parties could access.

Nevertheless, AEMO will need to consider privacy and confidentiality arrangements when disclosing the data obtained from other sources to network businesses.

The Commission is of the view that AEMO should be able to share the locational and technical characteristics of devices in the DER register with network businesses in relation to their network areas.

Sharing (aggregated) data with a wider audience

Many stakeholders (incl. PIAC, TREA, Energy Queensland, Dr Crossley and CEEM, UNSW) were in favour of sharing information for public interest purposes, including for policy development and research.

As noted previously, section 54FA authorises AEMO to disclose information in aggregated form given to it in confidence. This means AEMO is allowed to disclosure aggregated data to bodies such as to policy-makers, researchers, consultants and other market participants or investors.[199]

It is relevant to note that, every month, the CER publishes aggregated data (by postcode) relating to small-scale renewable energy devices that have had certificates created against them. This data includes the number of units and their capacity.

199 s54A permits AEMO to disclose protected information in a form that has been combined or arranged with other information so that it does not reveal any confidential aspects.

The Commission recognises that there will be an increase in administrative burden for AEMO to provide this information but considers the benefits of providing this information outweigh this cost. Therefore, the Commission recommends introducing an obligation on AEMO to periodically report publicly relevant information from the DER register at an appropriate level of aggregation.

Competition concerns

Some Registered Participants, including aggregators and retailers, have expressed interest in gaining access to information in the DER register. However, some stakeholders were concerned that competition issues might arise if some parties (such as retailers) were given greater access to the data than others.

The Commission considers that there is not a strong case that allowing these parties access to the register would enhance the safety or operation of the national electricity market. Further, it is not appropriate for parties to have access to protected information for commercial purposes. For that reason, the Commission does not recommend that Registered Participants other than NSPs have access to disaggregated information contained in the DER register.

Some stakeholders also considered that there could be competition issues if DNSPs have access to commercially sensitive information obtained from other sources. In particular, these issues could arise if DNSPs use this data to sell competitive services (e.g. demand management solutions).

The AER's Electricity Distribution Ring-Fencing Guidelines create accounting and functional separation of the provision of direct control services by DNSPs from the provision of other (competitive) services by DNSPs.

Box 7.1 below details the information access and disclosure provisions included in the Guidelines and that would be relevant to this rule change.

Box 7.1 Ring-fencing

The Electricity Distribution Ring-fencing Guideline is prepared by the AER under clause 6.17.2 of the National Electricity Rules (NER). Under clause 6.17.1 of the NER, this Guideline is binding on all Distribution Network Service Providers (DNSPs).

The guideline imposes obligations on DNSPs that aim to prevent a DNSP conferring a competitive advantage on its related entities that provide contestable electricity services; and ensure a DNSP keeps information it acquires or generates confidential, and handles that information appropriately.

Protection of information

Subject to clause 4.3 of the Ring-fencing Guideline[200], a DNSP must:

- keep confidential information confidential
- only use confidential information for the purpose for which it was acquired or generated.

Disclosure of information

A DNSP must not disclose confidential information to any person, including a related electricity service provider, unless:

(a) the DNSP has first obtained the explicit informed consent of the relevant customer, or prospective customer, to whom the confidential information relates

(b) the disclosure is required by, or for the purpose of complying with any law

(c) the disclosure is necessary to enable the DNSP to provide its distribution services, its transmission services or its other services (including by acquiring services from other legal entities)

(d) the information has been requested by or on behalf of a customer, or potential customer, of another legal entity, and the disclosure is necessary to enable the legal entity to provide its transmission services, contestable electricity services or other services to the customer or potential customer

(e) the disclosure is solely for the purpose of providing assistance to another Network Service Provider to the extent necessary to respond to an event (such as an Ring-fencing Guideline Version 2 – October 2017 17 emergency) that is beyond the other Network Service Provider's reasonable control

(f) the disclosure is solely for the purposes of research by a legal entity other than a related electricity service provider of the DNSP

(g) where another DNSP is an affiliated entity of the DNSP, the disclosure is to the part of that other DNSP that provides that other DNSP's direct control services

(h) a related electricity service provider of the DNSP has requested the disclosure and the DNSP complies with clause 4.3.4 in relation to that confidential information.

200 Australian Energy Regulator, *Ring-fencing guideline electricity distribution*, October 2017, pp. 16-17.

The Commission considers that the existing Ring-Fencing Guidelines are sufficient to prevent these competition issues from arising. If concerns do arise, the AER has the power to review and amend ring fencing guidelines prior to the DER register commencing or later if issues arise.

7.3.3 Privacy concerns

AEMO is subject to the *Privacy Act 1988* Cth, which regulates the use and disclosure of 'personal information'. AEMO must comply with the APPs as set out in Schedule 1 to that Act.

The APPs set out how APP entities must deal with personal information including its collection, use and disclosure.

Personal information means information or an opinion about an identified individual, or an individual who is reasonably identifiable:

(a) whether the information or opinion is true or not, and;

(b) whether the information or opinion is recorded in a material form or not.

The COAG Energy Council was of the view that the APPs would not prevent the implementation of the DER register as proposed.[201]

The prohibition in APP 3 against an APP entity collecting personal information does not apply if the information is reasonably necessary for one or more of the entity's functions. The information collected by AEMO would fall within this category given that it would be collected in accordance with AEMO's functions. The purposes for collection will be set out in the NER.

Under APP 6, if an APP entity holds personal information about an individual that was collected for a particular purpose (primary purpose), the entity must not use or disclose the information for another purpose (secondary purpose) unless the individual consented or, relevantly, the use or disclosure is 'required or authorised by or under an Australian law'.[202]

To the extent that AEMO's use and disclosure of information on the DER register would be relevant to APP 6, that use and disclosure could be authorised by the NEL and/or NER. To constitute an authorised disclosure for the purposes of APP 6, a NEL or NER provision would need to authorise either explicitly or by necessary implication the use and disclosure of personal information as defined in the Privacy Act.

Many stakeholders considered that the existing regulatory arrangements should be sufficient to address any potential privacy and confidentiality concerns that the DER register may raise.

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201 Rule change request, p. 10.

202 Australian law is defined in section 6 of the Privacy Act to include (a) an Act of the Commonwealth or of a State or Territory; or (b) regulations, or any other instrument, made under such an Act.

Ausgrid, for example, noted that "in our experience the Privacy Act puts in place robust safeguards that would be sufficient to guard against the misuse of information collected and held in the register".[203]

The Commission is of the view that the draft rule is consistent with the current arrangements under the Privacy Act and provisions in the NEL.

Open Banking Review and Consumer Data Right

Any rights for access to the DER information register by consumers or their authorised representatives should be considered as part of broader changes that may be needed following progress on the Consumer Data Right work.

7.3.4 Cost recovery mechanism

AEMO noted in its submission to the consultation paper that it would cost approximately $1.1 million to establish a DER register and $150,000 per annum to maintain and operate a register on an ongoing basis.[204]

The extra costs associated with establishing and maintaining a discrete cost-recovery framework for the DER register would likely be significant in relative terms. In addition, the benefits derived by NSPs from use of the data would accrue to all customers, meaning that it is appropriate for customers to bear the costs (NSPs would likely pass through any charges and smear them over all customers, in any event).

Based on this analysis, the Commission considers that no special cost recovery mechanism is required for the DER register. In its view, it is appropriate for AEMO to fund any incremental costs imposed by the establishment of the register from its ongoing Participant fees budget.

7.4 Commission's position

The draft rule:

- introduces a data sharing framework that obliges AEMO to share disaggregated data regarding the locational and technical characteristics of devices in the DER register with network businesses in relation to their network areas
- places an obligation on AEMO to periodically report publicly relevant information from the DER register at an appropriate level of aggregation. The details of the timing and format of the report are to be set out in the DER register information guidelines

203 Ausgrid, submission to consultation paper, attachment 1, p. 13.

204 AEMO, submission to consultation paper, attachment 1, p. 2.

- requires NSPs to provide AEMO with all currently held DER generation information (as specified in the guidelines) within their network as part of the first reporting cycle after the guidelines commence
- enables AEMO to include in the DER register, on an ongoing basis, relevant DER information that AEMO has access to from other sources which in AEMO's opinion will assist NSPs to meet their regulatory obligations or requirements.

8 Safety issues and emergency response

The regulation of electrical safety falls within the remit of jurisdictional departments or jurisdictional safety regulators in each state and territory. The Commission does not directly consider issues involving safety in the context of emergency services; however it recognises that safety of the public is an important consideration.

This chapter outlines stakeholder views regarding the potential benefit of sharing data in the DER register to assist with emergency situations involving DER. It also sets out further details on the Commission's draft rule on the issue of safety and sharing of information for this purpose.

8.1 COAG Energy Council's view

The COAG Energy Council's rule change request considers safety as a secondary objective of the DER register. The rule change request suggests that a register would help protect the safety of consumers, workers and first responders in the event of emergencies involving DER affected by fire, floods or other extreme conditions.[205]

8.2 Stakeholder views

Stakeholders expressed a variety of views regarding the benefits of the DER register to help protect the safety of consumers, workers and first responders in the event of emergencies. The majority of stakeholders agreed that having information regarding DER would be beneficial for first responders however many questioned whether the DER register is the most appropriate or useful approach for achieving this benefit.

Many stakeholders considered that Australian Standards or signage would be more useful for protecting the safety of emergency services when responding to an emergency involving DER.[206]

S&C Electric, Dr Martin Gill, the Tasmanian Renewable Energy Alliance and Jemena pointed to the draft *AS/NZS 5139, Electrical Installations – Safety of battery systems for use with power conversion equipment* as offering other potential solutions to address the safety issues associated with battery storage systems.[207]

AEMO considered that there is merit in emergency services having restricted access to information in the DER register to determine if DER is present at a property when

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205 COAG Energy Council, *Register of distributed energy resources*, rule change request, October 2017, p. 2.

206 Consultation paper submissions: AGL, p. 6; Ausgrid, attachment 1, p. 14; S&C Electric Company, p. 9; Dr Martin Gill, p. 11; Tasmanian Renewable Energy Alliance, pp. 1-2; Jemena, attachment 1, p. 8; PIAC, attachment 1, pp. 8-9; Endeavour Energy, pp. 11-12.

207 Consultation paper submissions: S&C Electric Company, p. 9; Dr Martin Gill, p. 11; Tasmanian Renewable Energy Alliance, pp. 1-2; Jemena, attachment 1, p. 8.

responding to an emergency.[208] AEMO suggested that even though there is currently no formal process for sharing data with emergency services, a possible solution could be for the information to be shared through a 'NMI discovery' process similar to what is currently in place for ombudsman queries.[209]

AusNet Services highlighted that DNSPs are often requested to disconnect supply when responding to fire or floods, therefore it may be useful for emergency services to request DER information through these channels also, provided access was fast and convenient.[210]

EnergyAustralia acknowledged that emergency responders may benefit from having access to the DER register however considers it is for jurisdictional regulators to consider whether greater safety regulation is required.[211]

Ausgrid raised concerns about emergency responders relying on the information that it provides given the static nature of the register and the potential unreliability of data collected via connection applications.[212]

Energy Queensland's engagement with emergency services revealed opportunities to enable the sharing of relevant DER data and a framework for sharing such data is currently being explored. Energy Queensland suggested there would be a need for coordination with the emergency services' geospatial system for the DER register to be beneficial.[213]

Dr Penelope Crossley has previously engaged with NSW Fire Brigades and RFS and they advised that if the presence of a battery at a premises is identified, the Hazmat Team then need to respond to the emergency which delays the response, however for DER register data to be useful Dr Crossley suggested that a 'Google maps' style functionality would help in identifying the presence of DER.[214]

The AEMC contacted the AFAC, the peak body for fire and emergency services, to request it distribute the consultation paper to their members for feedback, however no submissions were received.

208 AEMO, submission to consultation paper, attachment 1, p. 7.

209 AEMO, submission to consultation paper, attachment 1, p. 8.

210 AusNet Services, submission to consultation paper, appendix A, p. 7.

211 EnergyAustralia, submission to consultation paper, p. 3.

212 Ausgrid, submission to consultation paper, attachment 1, p. 14.

213 Energy Queensland, submission to consultation paper, p. 15.

214 Dr Penelope Crossley – University of Sydney Law School, submission to consultation paper, pp. 7-8.

8.3 Analysis

8.3.1 Commission's safety considerations

The Commission considers that safety of the energy system and the public is an important consideration of the various energy market objectives that it operates under. However the national electricity objective/national electricity retail objective refers to safety in the context of the power system being safe if is maintained and is operating in a secure condition. The safety of the power system is linked to the security of the power system and relates primarily to the operation of assets and equipment within their technical limits. The Commission is not able to directly consider issues involving safety in the context of emergency services when considering the NEO.[215]

Safety concerns associated with DER equipment are best addressed by jurisdictional safety regulators[216] however the Commission recognises the importance of safety and therefore sought feedback from stakeholders on this issue. The majority of stakeholders agreed that there is benefit of sharing of data in the DER register for safety reasons however concerns were raised as to the practicality of doing so. Stakeholder engagement provided limited evidence from emergency service responders themselves on how the sharing of information collected by a DER register could be useful.

The Commission does not consider safety, in the context of the NEO, as a primary benefit of the register; however given views expressed by stakeholders, the Commission considers that sharing of data for this purpose should not be precluded by the rules.

The draft rule therefore allows AEMO to share information with emergency services agencies, if requested, subject to an obligation on AEMO to use its reasonable endeavours to ensure that the information is kept confidential.

The Commission considers it is important for emergency services to be aware of the potential limitations of this data particularly if the level of compliance with reporting DER information is low. As discussed previously, the coverage of the register is unlikely to be complete and as such other solutions such as Australian Standards and signage may be more practical and useful for dealing with emergency situations.

215 For example, first responders and fire services.

216 The regulation of electrical safety falls within the remit of jurisdictional departments or jurisdictional safety regulators in each state and territory. State and territory legislation governs the safe supply of electricity by network service providers and the broader safety requirements associated with electricity use in households and businesses.

Box 8.1 Standards Australia

Australian Standards outline technical, building and safety standards for electricity storage devices and their installation. While the use of all Australian standards is generally voluntary, Australian standards set fundamental parameters for how distributed energy resources can be installed and operated.[217]

In 2016 Standards Australia, in collaboration with Energy Networks Australia, launched a work plan for improving Australian standards to support a future with distributed energy resources.

In December 2017, Standards Australia adopted the international product standard for battery storage, *AS IEC 62619:2017, Secondary cells and batteries containing alkaline and other non-acid electrolyte – Safety requirements for secondary lithium cells and batteries*. This standard covers safety requirements for batteries for use in stationary and mobile applications as well as applied to residential and commercial battery systems.[218]

Standards Australia is also currently consulting on the future development of onsite battery storage standards in Australia, including safety elements of battery storage - *AS/NZS 5139, Electrical Installations – Safety of battery systems for use with power conversion equipment*.[219] This will complement the recent adoption of the international product standard for battery storage. Standards Australia is due to issue this for a second round of public consultation in 2018.[220]

8.4 Commission's position

The draft rule:

- allows AEMO to provide DER register information to an emergency services agency if requested for the purposes of that agency's response to an emergency or for planning in relation to emergency responses.
- requires AEMO use reasonable endeavours to ensure that any confidential information it discloses to an emergency services agency is treated as confidential information by that agency.

217 Compliance with Australian Standards can be required through requirements of safety regulators, AEMO procedures or DNSP connection agreements.

218 Standards Australia, Media Release: *Australia adopts international product standard for battery storage*, 13 December 2017.

219 Standards Australia, Media Release: *Future development of onsite battery storage standards in Australia,* 18 August 2017.

220 Standards Australia, Media Release: *Work continues on battery storage standards for Australia,* 21 December 2017.

Abbreviations

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
APPs	Australian Privacy Principles
CBA	cost benefit analysis
CCEW	Certificate of Compliance for Electrical Work
COAG Energy Council	Council of Australian Governments Energy Council
Commission	See AEMC
DER	distributed energy resources
DNSP	distribution network service provider
DSP	demand side participation
EMTPT	Energy Market Transformation Project Team
ENA	Energy Networks Australia
NEL	National Electricity Law
NEO	National electricity objective
NEM	national electricity market
NER	National Electricity Rules
NERL	National Energy Retail Law
NERO	National energy retail objective
NERR	National Energy Retail Rules
NMI	National Metering Identifier
NPV	net present value
NSP	network service provider

PV	photovoltaic
TNSP	transmission network service provider

A Summary of other issues raised in submissions

This appendix sets out the issues raised in the first round of consultation on this rule change request and the AEMC's response to each issue. If an issue raised in a submission has been discussed in the main body of this document, it has not been included in this table.

Stakeholder	Issue	AEMC Response
Assessment framework		
AGL, p. 3.	The prevailing criteria in the assessment framework should be whether the rule change would best serve customers' changing preferences and needs. In addition: • customers should be provided easy access to their own consumption data • customers should retain direct control over who is permitted access to their data, other than regulated entities for market settlement and other regulated purposes • the ability to use data to drive a competitive advantage will motivate data creation and product and service innovation, which is ultimately in the customers' interest.	The DER register will not include consumption data. Besides, non-regulated entities will not have access to the register. We note that the proposed data sharing arrangements are discussed in Chapter 7.
Deakin University, p. 2.	Restricting the assessment framework to consideration with respect to the NEO/NERO does not directly address all aspects of safety. Assessment against a framework that doesn't account for the dynamic, granular nature of DER will restrict benefits.	The regulation of electrical safety falls within the remit of jurisdictional departments or jurisdictional safety regulators in each state and territory. The Commission does not directly consider issues involving safety in the context of emergency services; however it recognises that safety of the public is an important consideration. The COAG Energy Council requested a rule change to establish register of static DER information.

Stakeholder	Issue	AEMC Response
Ausgrid, attachment 1, pp. 1-2.	The AEMC should place particular weight on ensuring that regulatory and administrative burden of introducing a DER register is proportional to the costs of the issues that are trying to be resolved. For example, we encourage the AEMC to assess if many of the issues raised in the Consultation Paper are already addressed by the information gathering powers AEMO has under the Demand Side Participation Information Guidelines.	The Commission consider that the 'active' load information that is relevant to the DER register is already being reported to AEMO under its Demand Side Participation Information Guideline. In order to avoid duplicating the data collection process for 'active' load information, the draft rule requires AEMO to include the relevant information already being reported under the DSP guidelines into the DER register on an ongoing basis.
Dr Penelope Crossley - University of Sydney Law School, p. 1.	Incorporate under the heading, “Balance information transparency and confidentiality” that consumers to have access to their own data to inform efficient investment and operational decisions.	It is likely more cost effective and efficient for consumers to gain information about an existing product installed at their premises from more direct avenues, such as the previous property owner or the manufacturer of the device.
Energy Queensland, p. 5.	Inclusion of an additional criterion to acknowledge the potential for better information to improve public safety outcomes.	The regulation of electrical safety falls within the remit of jurisdictional departments or jurisdictional safety regulators in each state and territory. The Commission does not directly consider issues involving safety in the context of emergency services; however it recognises that safety of the public is an important consideration.
Energy Queensland, p. 5.	Energy Queensland recommends including network constraints in its assessment. Feeders and network protection systems have been designed to operate within specific technical parameters, and are affected by higher penetrations of solar PV and battery systems.	This issue is addressed by the criteria 'improve operation of the power system'.
Centre for Energy and Environmental Markets, UNSW, pp. 3-4.	An emphasis on maintaining – in addition to improving – operation and investment decision making is recommended. Ideally, the assessment framework would also consider what information would be necessary to facilitate optimal operation of	The Commission considers that the combined assessment criteria of "improve operation of the power system" and "promote better investment decisions" encompasses the suggestion of "maintaining operation and investment decision making".

Stakeholder	Issue	AEMC Response
	distribution level markets and how to manage the participation of households.	The second point is beyond the scope of the rule change request; namely, the COAG Energy Council requested a rule change to establish register of static DER information.
Benefits		
PIAC, p. 3.	The register could also be useful for new owners of properties to access information about an existing product.	It is likely more cost effective and efficient for consumers to gain information about an existing product installed at their premises from more direct avenues, such as the previous property owner or the manufacturer of the device.
Clean Energy Council, p. 3.	A register of static information would certainly assist with meeting the objectives outlined by COAG Energy Council. However, this proposal appears to have been superseded by the proposal for a dynamic register to be held by AEMO, as proposed by Treasury and the Department of Energy and Environment. The register proposed for the implementation of the Consumer Data Right in the energy sector would also provide significant benefits for retailers, designers and purchasers of DER systems.	Establishing the register is considered to be an appropriate first step towards increasing visibility over DER. As part of the Commonwealth Government's overall data strategy for energy, it is considered that the DER register complements other initiatives such as the Consumer Data Right.
Formbay, attachment 1, p. 3.	*What features does a register need to have in order to meet the objectives outlined by the COAG Energy Council?* Seamless collection processes for DNSPs, standardisation of process nationally (where able) and secure, reliable management of the digital collection process.	These features have been incorporated into the design of the data collection and governance framework (see Chapters 4 and 5) of the DER register.
Energy Queensland, p. 9.	*What features does a register need to have in order to meet the objectives outlined by the COAG Energy Council?* The register must be user friendly to ensure that entry/upload of information is easy and aligns with DNSP connections portals/systems.	The Commission considers that there is merit in a rule that provides some flexibility to AEMO with respect to the nature and form of the information included in the register. The draft rule obliges AEMO to determine, in consultation with stakeholders, the appropriate format in which DER information should be provided.

Stakeholder	Issue	AEMC Response
Compliance		
Australian Energy Regulator, p. 3.	The compliance challenges are likely to remain unclear until there is further clarity on the process for collecting information from DER owners, and who bears the relevant obligations.	As described in the draft determination, the draft rule prescribes the obligations on parties and mechanisms to collect DER register information.
AEMO, attachment 1, p. 6.	To drive compliance, this should be applied via Rules based obligations and penalties. A clear obligation on parties to pass this information on to AEMO is likely also required.	
AusNet Services, appendix A, p. 5.	Metering Coordinators and Metering Providers may be able to participate in the enforcement of DER collection through their ability to enable or disable the separate recording of bidirectional energy flows, or temporary disconnection of customers whilst their export exceeds agreed limits. However, these arrangements would require Rule changes to support their operation.	The Commission does not consider it appropriate to disconnect customers if they fail to provide DER information to their local network service provider.
Centre for Energy and Environmental Markets, UNSW, p. 10.	We suggest setting a compliance target and reviewing this annually, for instance aiming for 90% of systems or more, as in the manner of the CER, to be recorded and with updates (either additional infrastructure or firmware) being recorded. An annual audit could ascertain the level of compliance present.	It is not clear how it would be possible to set up a compliance target without knowing the number of DER that should be registered.
AusNet Services, appendix A, p. 5.	DNSPs currently lack practical mechanisms to participate in enforcement of customers obligations to seek connection agreements for new or altered DER assets at their premises. The DER register provides an opportunity to address this issue.	The draft rule does not prescribe additional enforcement mechanisms, but provides the opportunity for NSPs to communicate and educate customers and installers about the need to register DER information.
Energy Networks Australia, p. 2.	While Energy Networks Australia considers that the National Connection Guidelines will make the data collection process easier and more streamlined, it will not ensure provision of the required data by installers and/or owners of the DER.	

Stakeholder	Issue	AEMC Response
S&C Electric Company, p. 7.	Low compliance levels will limit the effectiveness of the register to support forecasting. However, some of the low compliance may be due to the complexity of the connection process and lack of awareness as to why DNSPs and AEMO need to know where DERs are located.	
PIAC, attachment 1, p. 7.	It may be the case that communicating the safety benefits of having a DER register is an effective motivator to achieve compliance.	
AusNet Services, appendix A, p. 5.	Publishing rules that communicate in plain language customer requirements to advise the DNSP of additions and changes to solar, battery, inverter and other DER systems.	
Jemena, attachment 1, p. 5.	Awareness of compliance can be maintained through public campaigns and ongoing improvements to education, training and licencing. Victorian DNSPs are required to provide a customer charter at the time of connection, upon request or at least once every 5 years. Including customer obligations to provide DER information to the DNSP in the charter can promote compliance over time as technology changes.	
S&C Electric Company, p. 7.	A major challenge will be ensuring that installers notify the DNSP of any new DERs. For DERs in receipt of an incentive, this may be captured by the CER, but in any case, an incentive should not be received unless the DER is registered.	DERs that receive any form of incentive should be captured through AEMO's Demand Side Participation Information Guidelines.
S&C Electric Company, p. 7.	If the DER is being offered to AEMO or the DNSP to provide a service, then that DER should be registered before receiving any financial benefit.	

Stakeholder	Issue	AEMC Response
S&C Electric Company, p. 7.	If there is a benefit to registering the DER either directly to the connectee or the party providing the DER (installer, retailer), such as accreditation or ongoing accreditation, or access to special tariffs and/or markets, then this may incentivise registration.	The Commission supports industry led accreditation mechanisms that may improve levels of compliance. That is discussed in Chapter 6.
Achieving compliance in the future		
Centre for Energy and Environmental Markets, UNSW, p. 10.	We recommend the following actions are taken to support compliance over time as technology changes: • consistency of format and units (reduced barrier to participation by wide range of stakeholders) • frequent review of compliance mechanism(s), and DER definition to be stated in the AEMO guideline, as well as the frequency of audits required.	The Commission recognises that future changes in technology could influence compliance with reporting obligations. As discussed in Chapter 4, the Commission is of the view that the proposed governance framework is flexible enough to be amended to consider future technology changes.
SA Power Networks, attachment 1, p. 4.	The registration process should be automated as much as possible.	
PIAC, attachment 1, p. 7.	It is worthwhile undertaking behavioural research to understand the reasons for lack of compliance where this is an issue. This should explore the best motivations for different participants including installers, retailers and DER owners. For example, whist well targeted incentives and penalties can be effective, people are often motivated for other purposes, especially regarding community benefits.	
PIAC, attachment 1, p. 8.	Over time, the method of purchase and installation of technology is likely to change. Periodic behavioural research exploring the best strategies for compliance is an effective way to ensure that high levels of compliance can be maintained.	

Stakeholder	Issue	AEMC Response
Costs		
Formbay, attachment 1, p. 3.	The costs involved in the collection of DER data would be the provision of an app to be used on-site during generator installations and the associated costs of providing back-end infrastructure and hosting of data (server costs).	The Jacobs' cost benefit analysis assumed that data would be collected and disseminated to AEMO using a new 'fit for purpose app' that streamlined existing DNSP connection processes. The Commission considers that there is merit in a rule that provides some flexibility to AEMO with respect to the nature and form of the information included in the register. The draft rule obliges AEMO to determine, in consultation with stakeholders, the appropriate format in which DER register information should be provided.
AGL, p. 5.	We consider that a data exchange architecture underpinned by application programming interfaces (APIs) would prove to be more cost effective and would urge the Commission to consider further analysis to assess the costs and benefits of this approach.	The Commission is of the view that implementation costs will be minimised by making use of AEMO's existing data platforms, such as MSATs.
EnergyAustralia, p. 3.	Other options that may help to reduce the costs or address the problem in a different way include: • trialling data collection in certain sections of the DER industry, or in one state first; or • data analysis and studies of different profile types may be a simpler, less costly and more accurate way to detect the types of DER present at each site.	Several stakeholders suggested that including dynamic DER data would increase the benefits articulated by the rule change request, by providing more accurate insight into the behaviour of DER devices and their subsequent impact on the power system. The Commission considers that improved information on the static characteristics of DER devices is a first step towards increasing system visibility over DER, and has the potential to better inform the decisions and process of energy market stakeholders, including AEMO and network service providers.
Dr Martin Gill, p. 2.	Workshop discussions highlighted data collection for the DER will be manually based. Manual systems are expensive, inaccurate and slow. Non-Intrusive Load Monitoring (NILM) supports fully automated updating of relevant DER data into AEMO systems for inclusion in their load forecasts. NILM avoids the significant costs to maintain the static DER register.	

Stakeholder	Issue	AEMC Response
Data collection		
AEMO, attachment 1, p. 5.	Close collaboration between DNSPs and AEMO is required to develop the most economic collection process. Costs in this regard must be minimised and AEMO is keen to build upon existing systems and practices, such as those applied by the Clean Energy Regulator in the collection of solar PV data, and the DNSPs existing connection processes.	As discussed in Chapter 5, the Commission is of the view that making use of existing processes to leverage the data collection of DER for the purposes of the register is expected to be more cost efficient than other alternatives, such as the introduction of new obligations or processes.
CitiPower, Powercor, United Energy, p. 1.	We propose that customers be obliged to inform DNSPs of new and augmented installations, with practical financial penalties in the case of non-compliance.	As discussed in section 5.3, a connection alteration is part of the definition of connection service and should already be captured through the existing Application of Connection Service. In that sense, network service providers can raise awareness of the process requirements through communication and education of consumers and installers.
Energy Networks Australia, p. 2.	We consider that the AEMC should not put any mandatory obligations on networks to provide information to the proposed register without also putting some level of obligations on the installers or owners of the DER as well.	
Clean Energy Council, p. 1.	We strongly urge the AEMC to consider the role that DER retailers (as distinct from DER installers) could play in ensuring the success of the register.	The Commission cannot place obligations on DER retailers according to its powers under the NEL.
PIAC, attachment 1, p. 10.	PIAC agrees with Dr Crossley that consumers should have a process to access and correct their own data without having to submit a Freedom of Information request. This process should be easy to access and understand to ensure that consumers have control of their data.	It is likely more cost effective and efficient for consumers to gain information about an existing product installed at their premises from more direct avenues, such as the previous property owner or the manufacturer of the device. It is worth noting that the DER register will only include standing data.
PIAC, attachment 1, p. 10.	Although the register is not retrospective, the option should be given to owners of DER to add their existing system/s to the register. The ability to do this should be communicated to the community, and the benefits of having DER registered should be articulated.	The draft rules places an obligation on NSPs to provide AEMO with all information they hold which would be DER generation information. Even though the quality and completeness might not be the same, it will likely cover a wide range of legacy systems.

Stakeholder	Issue	AEMC Response
S&C Electric Company, p. 2.	Where a DER is able to provide a service to the System Operator, the DER should be on the register. In some cases, the owner of the DER may contract directly with AEMO, but it is likely that any service contract will be via a retailer, aggregator or other entity in the electricity industry, who may also be the installer. Those current or future entities should have an obligation placed on them to ensure that DERs are being used to provide a paid-for service (to the System Operator or the DNSP/TNSP) or are receiving a tariff benefit (e.g. reduced tariffs for offering to support the system) are on the register.	DERs that receive any form of incentive should be captured through AEMO's Demand Side Participation Information Guidelines.
Endeavour Energy, p. 9.	Incorporation of battery storage data requirements in the Certificate of Compliance for Electrical Work (CCEW) processes may be at an incremental cost and an opportunity to leverage with NSW Fair Trading.	The Commission cannot place obligations in the NER on jurisdictional safety regulators. However, the Commission considers that electrical safety compliance certificates could be a useful mechanism to collect relevant DER register information. The Commission recommends that state safety regulators investigate how existing compliance mechanisms could be used to improve submission of appropriate DER information to DNSPs, including whether it is appropriate to amend the data fields collected under electrical safety certificates. This data might also be shared directly with AEMO if all parties consider it appropriate.
Clean Energy Council, p. 1.	The application of the Consumer Data Right to the energy sector provides an opportunity to create an incentive based approach. Linking access to the scheme with verification of DER reporting would build support for the reporting framework and would ensure that the entire system does not rely on a compliance approach, which has already proven unsuccessful in Queensland.	It is too early to tell how the DER register and the Consumer Data Rights will interact.

Stakeholder	Issue	AEMC Response
System changes		
SA Power Networks, p. 1.	To support the proposed national register, we would need to: • develop IT systems to facilitate collection and storage of data • develop new processes to ensure data quality and compliance • develop new interfaces with a national register.	Noted.
Data sharing		
EnergyAustralia, p. 3.	Access to the data collected by the register should only be available to authorised persons (including customers) and protected by similar procedures that apply to current practices for meter data and MSATS data.	The proposed data sharing arrangements are discussed in Chapter 7. Any technical and operational details on how data will be shared will be defined through AEMO's guidelines in consultation with stakeholders. The AEMC considers that the existing privacy arrangements are sufficient to deal and mitigate any potential privacy issues.
EnergyAustralia, p. 3.	The organisation hosting the data would also need to be able to certify each industry party (e.g. a distributor, retailer, or other organisation) at an overall level as well.	
S&C Electric Company, p. 3.	Sharing of data, both metering and static data in the register will need to be managed carefully and securely, as well as ensuring that other parties, such as DNSPs, who can benefit from the data to deliver cost effective investment outcomes, have appropriate access.	
CitiPower, United Energy, Powercor, p. 2.	We propose distributors be able to have access to collected information from AEMO in a format most practical for network management (such as consolidated spreadsheets).	
Jemena, attachment 1, p. 6.	Jemena supports sharing of information with third parties, subject to existing privacy laws. We propose the AEMC investigate and settle all matters regarding access, transparency and confidentiality of information in a DER register.	

Stakeholder	Issue	AEMC Response
PIAC, attachment 1, p. 7.	There would also need to be an obligation for DNSPs to share DER data with AEMO.	The draft rule introduces an obligation on NSPs to share DER information with AEMO. That is discussed in Chapter 5.
Centre for Energy and Environmental Markets, UNSW, p. 11.	The consultation paper suggests that participants not registered with AEMO might be required to pay a fee in order to access DER register data (page 32). We note that this could lead to information asymmetry between existing market participants and new entrants, which is not recommended. The free movement of information is essential to efficient market operation – asymmetry of information will lead to market distortions, creating an inefficient outcome.	The proposed data sharing arrangements are discussed in Chapter 7. The cost recovery approach is discussed in section 7.3.4. The Commission considers that no special cost recovery mechanism is required for the DER register.
Embedded networks		
CitiPower, United Energy, Powercor, p. 1.	We believe that the most practical spatial demarcation is the NMI to which the DER is connected. It is important to note that this should apply to embedded networks as well. Each embedded network will have one NMI, for which DER information should be provided in an aggregated form. In the case of embedded networks, the obligation to provide aggregate DER information to the distributor should be on the Embedded Network Manager or the Embedded Network Operator.	The Commission recognised that the draft rule does not include obligations on embedded networks. Embedded networks are currently exempted by the AER to comply with certain technical requirements set out in Chapter 5 of the NER. However, the AEMC is about to initiate further work into embedded networks which will take into consideration this issue.
Frequency of update		
CitiPower, United Energy, Powercor, p. 2.	The register should be updated on a continuous basis. This would ensure that the information in the register is up to date and relevant in real time, rather than updated periodically.	The Commission is of the view that the draft rule should not include unnecessary prescription in respect of technical or operational matters. In particular, we consider that it is appropriate

Stakeholder	Issue	AEMC Response
Deakin University, p. 6.	If the register consists of static, manually entered data then regular updates would add value. However, if DER systems are automatically reporting then the frequency of reporting should be determined by further study based on data volumes and granularity required for accurate interpretation.	for AEMO to specify when NSPs are to provide and update DER information, as well as the format in which it is to be provided. We note that many stakeholders commented on the frequency of reporting, and encourage AEMO to take these comments into account when drafting its guideline.
AEMO, attachment 1, p. 5.	It will be most efficient if data is collected and submitted at the time of equipment installation or modification. Depending on the implementation model, DNSPs could submit data to AEMO on a monthly basis or if the implementation framework allows the data could be sent to AEMO at the same time it is submitted to DNSPs.	The Commission recognises that, while there are concerns regarding the effectiveness of the two mechanisms that DNSPs use to obtain information about DER devices, making use of existing processes to leverage the data collection of DER for the purposes of the register is expected to be more cost efficient than other alternatives. DNSPs, through the network connection process and deemed standard connection contract, are best placed to facilitate data collection and provide it to AEMO. AEMO will, in consultation with stakeholders, define in the DER register information guidelines how often data will need to be provided to AEMO.
SA Power Networks, attachment 1, p. 4.	To be accurate and effective we believe data would need to be collected upon installation and updated upon modification.	
S&C Electric Company, p. 7.	The data needs to be collect at connection and updated whenever there is a change to the DER (brand, type, capacity).	
Ausnet, appendix A, p. 5.	As often as customers install or update DER assets the data would need to be collected and updated.	
Formbay, attachment 1, p. 4.	At point of installation and at point of any maintenance or modification to the system would be ideal.	
Dr Martin Gill, p. 2.	Some earlier studies estimated at any given time 10% of domestic solar systems are non-operational. No mechanism has been described to ensure the removal or failure of a consumer DER is recorded in the register. This suggests over time the data stored in the DER register will become increasingly inaccurate.	
TasNetworks, p. 5.	In an ideal world, the DER register would be updated every time DER and associated technology was installed, updated, modified, removed or transferred.	

Stakeholder	Issue	AEMC Response
Tasmanian Renewable Energy Alliance, p. 3.	Collection of data at the time of installation or tariff changes will meet most of the objectives of the proposed register. Requiring notification of subsequent changes by customers would be difficult to enforce and of limited additional benefit.	
Energy Queensland, p. 11.	Reporting should be required when the following takes place: • system installation and/or decommissioning (installer's responsibility) • changes to system size or technology (installer's responsibility) • changes to system energisation controls, such as a change of charge/discharge from a pool price trigger to a local demand response signal (contracting party or market participant responsibility).	
Endeavour Energy, p. 9.	Capture DER when systems are installed and when alterations are made (alteration could be defined by a minimum kW rating).	
Governance		
Formbay, attachment 1, p. 4.	It is always best to have 'one source of truth' on what is required (in this case, data collection for the DER), but then allow DNSPs and industry to determine how to best meet the overarching requirements outlined by AEMO.	The Commission considers that there is merit in a rule that provides some flexibility to AEMO with respect to the nature and form of information included in the register. This is because AEMO, in consultation with registered participants and others, is well placed to develop the data requirements of the register.
Greensync, p. 4.	Involving companies in the energy technology, telemetry and communications industries in focused design thinking is crucial to the creation of secure, transparent, efficient and optimised DER registries (or, better; marketplaces). Wider collaboration is also crucial to ensure that consumers' interests and protections are linked, and incentive arrangement link data capture from installation through to system operation.	The draft rule requires AEMO to consult with network service providers and other interested parties when developing the DER register information guidelines.

Stakeholder	Issue	AEMC Response
Granularity		
Centre for Energy and Environmental Markets, UNSW, p. 6.	At a high level, standardisation of the information gathered (i.e. consistent naming of inverters) and ensuring sufficient detail are key. At a minimum, the following information on inverter settings should be recorded: • frequency and voltage set points (multiple set points are expected) • time to disconnect following a disturbance • time to reconnection • any conditions for reconnection (i.e. voltage within bounds for a certain period of time) • disconnection and reconnection ramp rates.	The Commission is of the view that the draft rule should not include unnecessary prescription in respect of technical or operational matters. Rather, it is considered that AEMO, in consultation with registered participants and others, is well placed to develop the data requirements of the register.
Energy Queensland, p. 9.	Additions that should be captured - energisation mechanism/strategy (e.g. energisation on pool price, or to reduce peak evening load) and power quality modes.	
PIAC, attachment 1, p. 10.	It is more meaningful to consider capacity of generation or load, e.g. output capacity and charge capacity. For solar, it should be whichever is less, the PV array or the inverter and the capacity of an electric vehicle charger should be captured for the register, but not the presence or capacity of a car.	
Ausgrid, attachment 1, p. 4.	The register should at a minimum include the features outlined in the Consultation Paper, namely information on location, capacity, and technical characteristics.	

Stakeholder	Issue	AEMC Response
Implementation		
Centre for Energy and Environmental Markets, UNSW, p. 12.	We note that the Finkel Review recommendation stated that this register (along with a 'data collection framework' to provide 'real-time data') should be in place by mid-2018. We recommend that the DER register project is implemented as soon as possible and that in developing the guidelines AEMO refers to the numerous consultation processes undertaken to date on this topic. Ultimately, the register is most likely to provide value if it is accurate and up to date, and accessible for the parties wishing to utilise it; whether this is achieved will be a direct product of implementation.	The Commission is following the statutory timetable for a rule change and a final determination is due to be published in September 2018. If a rule is made, AEMO will need to consult with stakeholders on the content of the guidelines. AEMO has discretion on how to run the consultation process, but will need to follow the timetable in the rules consultation process.
Metering		
S&C Electric Company, p. 2.	Advanced metering data is probably the most powerful source of data to allow better management of system and networks, both for investment decisions and day-to-day operation. However, advanced meters are not deployed fully throughout the NEM and the Power of Choice process may have already limited access to the data for certain industry parties, including those that might be able to generate more efficient investment outcomes if they had access to the data.	The Commission considers that improved information on the static characteristics of DER devices is a first step towards increasing system visibility over DER, and has the potential to better inform the decisions and process of energy market stakeholders, including AEMO and network service providers.
Overlap with other initiatives		
AER, p. 4.	The consultation paper lists related AEMC projects and other sources of DER data. In addition the following projects and sources of data are also relevant: • NEM data strategy: in the consultation paper published on the 20 March 2018, the ESB identifies the overarching objective guiding the design and development of the strategy as being to	The Commission recognises that there are other ongoing projects in the industry that may also interact / relate to this rule change request. As discussed in Chapter 7, any rights for access to the DER information register by consumers or their authorised representatives should be considered as part of broader changes

Stakeholder	Issue	AEMC Response
	facilitate access to data that supports the outcomes of the Finkel review. • ARENA advancing renewables program: ARENA is allocating $12.5m funding to activities focused on DER. The scope includes projects that increase the visibility, predictability or control of DER. • DNSP demand side engagement: DNSPs are required under clauses 5.13.1(e)-(i) of the NER to prepare a demand side engagement strategy. This demand side engagement should also provide information on DER. This suggests there are other work streams underway and sources of data that may contribute to the visibility of DER even in the absence of rule changes.	that may be needed following progress on the Consumer Data Rights work.
Greensync, p. 2.	We note that there are a number of processes underway, that should, in an ideal world, provide input and direction to further work on the registry including: • the ESB's NEM data strategy • ENA's National Connection Guidelines principles and technical guidance • the Consumer Data Right and its application to the energy sector, and specifically the consumer electricity data access scheme • ECA's behind the metre code of conduct • updates to AS 5139 for battery installation.	

Stakeholder	Issue	AEMC Response
TasNetworks, p. 3.	TasNetworks notes that there a number of ongoing consultation processes that have relevance to the implementation of the proposed DER register. The Energy Security Board is presently seeking feedback on a national data strategy for the NEM. The Victorian Government, in conjunction with EY, recently released findings on the utility of an energy data hub for Victoria. In addition, the COAG Energy Council has engaged HoustonKemp Economists to make recommendations for allowing third party service providers access to customer consumption data. TasNetworks suggests monitoring these developments for consideration as part of the DER register consultation process would be beneficial.	The Commission recognises that there are other ongoing projects in the industry that may also interact / relate to this rule change request. As discussed in Chapter 7, any rights for access to the DER information register by consumers or their authorised representatives should be considered as part of broader changes that may be needed following progress on the Consumer Data Rights work.
PIAC, p. 2.	There should also be consideration of how the proposed rule change will interact with how the Consumer Data Right will be implemented in the energy sector.	
Energy Networks Australia, p. 2.	… Moving forward to establish the register, we believe further consideration will be required on how the proposed DER register would fit within the wider data framework identified as an outcome of the Finkel review.	The Commission recognises that there are other ongoing projects in the industry that may also interact / relate to this rule change request. As discussed in Chapter 7, any rights for access to the DER information register by consumers or their authorised representatives should be considered as part of broader changes that may be needed following progress on the Consumer Data
Clean Energy Council, p. 5.	We understand that AEMO and the CSIRO are working on a proposal to pinpoint the location of unreported, grid-connected batteries using the data that AEMO will hold as part of its role in the implementation of the Consumer Data Right in the energy	

Stakeholder	Issue	AEMC Response
	sector.	Rights work.
S&C Electric Company, pp. 2-3.	There are several significant current streams of work on data access and management in the Energy sector: • COAG Energy Council - Facilitating Access to Consumer Energy Data - Consultation Paper • COAG-ESB: National Electricity Market Data Strategy • Treasury: Review of Open Banking (which will apply to energy in due course, with Ch 2 setting overarching principles). Most of this work is not finalised, but any register for DERs should fit within the approaches being developed and should also provide the necessary consumer protections.	
Privacy and confidentiality		
AGL, p. 5.	We are strongly opposed to the models that utilise central data hubs. In our view, centralised hubs are a highly intrusive design, with associated privacy concerns of having all data available to a single party and within a single location. Central data hubs require robust security protocols, given the sheer volume of data and potential access seekers, and have major establishment and compliance costs with a high likelihood of issues relating to replication of existing solutions and participant systems. Furthermore, centralised hubs reduce incentives to create new data.	The Commission recognises stakeholders' concern about the use of centralised data hubs, but in this instance the Commission is of the view that implementation costs will be minimised by making use of AEMO's existing data platforms, such as MSATs. Data sharing arrangements are discussed in Chapter 7.
AGL, p. 6.	With customers' privacy concerns in mind, we consider that it would be more appropriate for customer data to be transferred via APIs rather than aggregated into a static register, and that these APIs should be built in accordance with standards set by an	Only NSPs will have access to disaggregated data on DER located in their network areas.

Stakeholder	Issue	AEMC Response
	independent body.	The Commission is of the view that the draft rule is consistent with the current arrangements under the Privacy Act and provisions in the NEL.
EnergyAustralia, p. 2.	Appropriate mechanisms will need to be in place to ensure the integrity of the register and restrict access to confidential information (and of course costed and weighted against the benefits of receiving that confidential information).	
PIAC, p. 1.	Consideration also needs to be given to protecting consumer's privacy.	
Dr Penelope Crossley - University of Sydney Law School, p. 6.	Australian Energy Storage Alliance (AESA) would like to seek residential data provided in an aggregated form for battery storage only, most likely aggregated by postcode or by region. The AESA proposes to use this aggregated battery storage data for entry into the Australian Energy Storage Database (portal). As this service is freely provided on-line at no charge, the AESA also would need this aggregated data supplied at no cost.	The draft rule proposes that AEMO publicly reports DER register information on an aggregated level on a regular basis. This report should meet the criteria set out by AESA.
Red Energy and Lumo Energy, p. 2.	Of additional concern is the fact that DNSP's are suggesting they require more information than AEMO and for it to include data the DNSP's do not even hold for other energy customers. Using the development of a DER register to obtain information sought for other purposes is obviously inappropriate.	The data fields to be collected for the DER register would be decided by AEMO in consultation with stakeholders.
S&C Electric Company, p. 6.	AEMO should be required to consider data security and who can access the data when developing the guidelines.	Agreed.
Safety and emergency response		
Deakin University, p. 8.	The range of DER technologies and installations results in problematic training of emergency workers. Deakin University has experienced significant customer response to its commercialised virtual reality fire fighting simulator, the FLAIM Trainer (http://flaimtrainer.com) It is suggested that a training environment	The regulation of electrical safety falls within the remit of jurisdictional departments or jurisdictional safety regulators in each state and territory. The Commission does not directly consider issues involving safety in the context of emergency services; however it recognises that safety of the public is an important

Stakeholder	Issue	AEMC Response
	is developed, based on information in a register, to ensure that information to emergency workers is meaningful and applicable in extreme situations.	consideration. The draft rule allows AEMO to provide DER register information to an emergency services agency if requested for the purposes of that agency's response to an emergency. AEMO must use reasonable endeavours to ensure that any confidential information it discloses to an emergency services agency is treated as confidential information by that agency.
TasNetworks, p. 6.	TasNetworks suggests emergency services entities are best placed to answer these questions. TasNetworks notes that with respect to information that might be useful to emergency services, information collected by DNSPs would be necessarily limited to on-grid resources.	
Formbay, attachment 1, p. 7.	The DER register will help with first responders in emergency situations by allowing them access to data which provides a clear picture of what is present on-site.	

B Legal requirements under the NEL

This appendix sets out the relevant legal requirements under the NEL for the AEMC to make this draft rule determination.

B.1 Draft rule determination

In accordance with s. 99 of the NEL the Commission has made this draft rule determination in relation to the rule proposed by the COAG Energy Council.

The Commission's reasons for making this draft rule determination are set out in section 2.4.

A copy of the draft rule is attached to and published with this draft rule determination. Its key features are described in section 2.4.1.

B.2 Power to make the rule

The Commission is satisfied that the draft rule falls within the subject matter about which the Commission may make rules. The draft rule falls within s. 34 of the NEL as it relates to:

- the operation of the national electricity market[221],
- the operation of the national electricity system for the purposes of the safety, security and reliability of that system[222], and
- the activities of persons (including Registered participants) participating in the national electricity market or involved in the operation of the national electricity system.[223]

B.3 Commission's considerations

In assessing the rule change request the Commission considered:

- its powers under the NEL to make the rule;
- the rule change request;
- submissions received during first round consultation; and
- the Commission's analysis as to the ways in which the proposed rule will or is likely to, contribute to the NEO.

221 NER, clause 34(1)(a)(i).

222 NER, clause 34(1)(a)(ii).

223 NER, clause 34(1)(a)(iii)

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for this rule change request.[224]

The Commission may only make a rule that has effect with respect to an adoptive jurisdiction if satisfied that the proposed rule is compatible with the proper performance of AEMO's declared network and system functions.[225] The draft rule is compatible with AEMOs declared network and system functions because it is unrelated to them and therefore does not affect the performance of those functions.

B.4 Northern Territory considerations

From 1 July 2016, the NER, as amended from time to time, apply in the Northern Territory, subject to derogations set out in Regulations made under the Northern Territory legislation adopting the National Electricity Law (NEL). Under these Regulations, only certain parts of the NER have been adopted in the Northern Territory.[226]

The Commission has considered whether a differential rule is required for the Northern Territory and concluded that it is not required in this instance. This is because the provisions of the draft rule either:

- have no application in the Northern Territory because they relate to provisions of the NER that have no effect in the Northern Territory (i.e. chapter 3); or
- have no practical effect in the Northern Territory because although they relate to chapters of the NER that do apply in the Northern Territory (i.e. chapters 10 and 11), the changes to that chapter relate only to provisions that have no application in the Northern Territory (i.e. they are definitions that are only used in provisions of chapter 3 that do not apply in the Northern Territory).

Chapter 5A will apply in the Northern Territory from 1 July 2019 unless the Northern Territory modifies the application of that clause in the Northern Territory before that date.

Therefore, as the draft rule relates to parts of the NER that currently do not apply in the Northern Territory the Commission has not assessed the draft rule against additional elements required by the Northern Territory legislation.[227]

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224 Under s. 33 of the NEL and s. 236 of the NERL the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for Energy. On 1 July 2011 the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. The amalgamated council is now called the COAG Energy Council.

225 Section 91(8) of the NEL.

226 For the version of the NER that applies in the Northern Territory, refer to: https://www.aemc.gov.au/regulation/energy-rules/northern-territory-electricity-market-rules/current.

227 National Electricity (Northern Territory) (National Uniform Legislation) Act 2015.

B.5 Civil penalties provisions

The draft rule does not amend any clauses that are currently classified as civil penalty provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the COAG Energy Council that any of the proposed amendments made by the draft rule be classified as civil penalty provisions.

B.6 Conduct provisions

The draft rule does not amend any clauses that are currently classified as conduct provisions under the NEL or the National Electricity (South Australia) Regulations. The Commission does not recommend that any of the proposed amendments made by the draft rule be classified as conduct provisions.