

MINUTES – DER REGISTER: NSP MEETING ON DATA REQUIREMENTS

MEETING: DER Register - NSP meeting on data requirements
 DATE: Tuesday, 18 December 2018
 TIME: 10.00 – 13.00 AEDT
 LOCATION: Webex Meeting

ATTENDEES:

NAME	COMPANY / DEPARTMENT
Eloise Taylor	AEMO
Gurinder Singh	AEMO
Jo Quest	AEMO
Kausik Samanta	AEMO
Michelle Norris	AEMO
Rama Ganguli	AEMO
Robert Speedy	AEMO
Roy Kaplan	AEMO
Robert Simpson	AusGrid
Justin Bethlehem	AusNet Services
Adrian Panow	Deakin University
Albert Pors	Endeavour Energy
Anthony Kavaliauskas	Endeavour Energy
Kevin Nuner	Endeavour Energy
Rob Cahill	Energy Queensland
Robert Mitchell	Energy Queensland
Matt Talbot	Energy Queensland (Energex and Ergon)
Graeme Ferguson	Essential Energy
Therese Grace	Essential Energy
Dennis Stanley	EvoEnergy
Jeff Roberts	EvoEnergy
Richard Pozza	EvoEnergy
Ricky Martin	EvoEnergy
Robert Clear	EvoEnergy
Subas Ghimire	Jemena
Damijan Krlevski	PowerCor
Dor Son Tan	Powercor
Adrian Honey	TasNetworks
Bradley Woods	TasNetworks
Natalie Kent	TasNetworks
Rodney Bray	United Energy

1. Confirm Agenda

The following topics were covered in the meeting:

- a) Data model structure
- b) Data fields
- c) Use cases (high level)

- d) Collection strategy (high level)
- e) Next steps

2. Action items raised at meeting

The following items were noted as needing further action following the meeting:

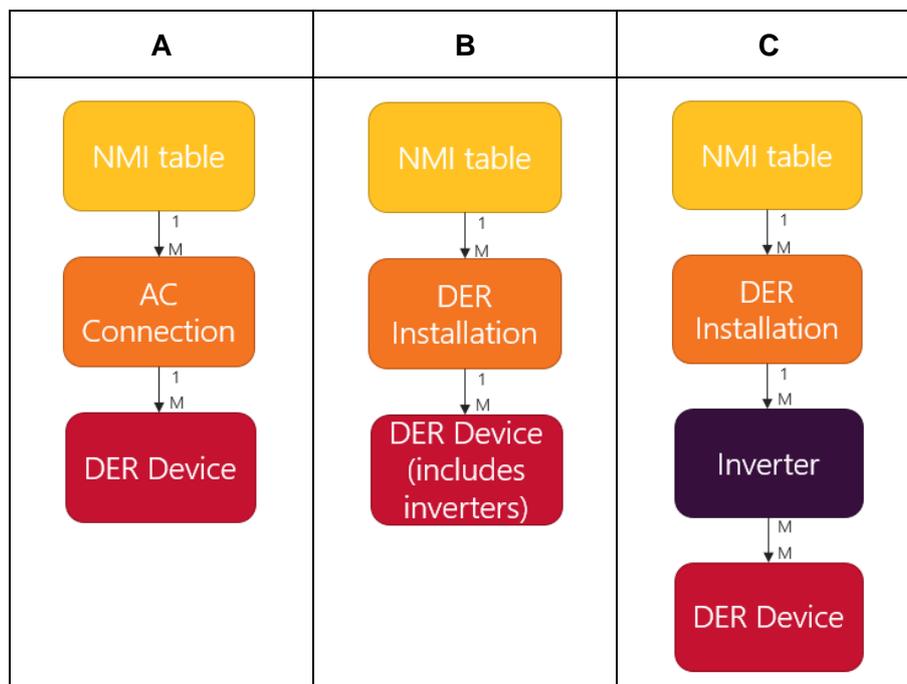
ITEM	TOPIC	RESPONSIBLE	DUE DATE*
1	Provide use cases of DER system configurations	DNSPs	7 Jan 2019
2	Provide specific written feedback on data fields or data model structure to derregister@aemo.com.au	DNSPs	7 Jan 2019
5	Set up meeting to discuss collection mechanism for DER Register information	AEMO	21 Dec 2019

* Indicative dates only

3. Items for discussion or noting

3.1. Data model structure

- Model A, below was the structure proposed in the meeting.
- Model B and C are potential other models that were discussed. DNSPs noted that DER installation information was typically collected via the connection application. This information covers the system in aggregate.
 - Suggested that a separate table for the aggregate system be created for population by DNSPs.
 - Child tables relating to DER devices, inverters, etc should be separate and contain information that would be physically collected by installers (onus still on NSPs in the NER to provide data).



- When a DNSP assesses DER connection applications the concern is the overall interaction of DERs with the network and the conditions that are placed on the

Permission to Connect for export limits and other settings at the meter level. These conditions reflect overall (total) system limits rather than prescribing limits on individual subsets of systems. Given this approach DNSPs felt that it was essential to introduce another level (table) between tables 1 and 2 to reflect “system limits”. Installers are then able to configure the DERID settings to accommodate DNSP requirements for a whole of DER systems output.

- There was broad discussion on the opportunities and importance of making the collection process as efficient as possible (discussion was deferred to later in the meeting section 3.4 of the minutes).
- AEMO acknowledged the request for examples of how the data model would apply to use cases to be included in issues paper.
- Question on why everything is duplicated with the AC connection table and DER Device table. Difference explained (one is at the device level, which sits behind the AC connection/ inverter level). Noted that this difference needs to be cleaner and clearer in the issues paper and the data entry should be as efficient as possible (remove duplication).

3.2. Data fields - general

- Detailed comments on the data fields are recorded in the ‘data updates raised in meeting’ section, below. (Note: This only reflects the discussion around the variables, not how the tables will change following this meeting). AEMO will circulate a clean version separately in the new year.
- ‘Who will collect the data’ column, was clarified to mean the physical collection of the data, rather than the NER prescribed obligation to collect data, which is placed on the NSPs.
- AEMO clarified that whilst DNSPs have the responsibility for collection on DER data, this need not mean the physical collection of the data itself. DNSPs are able to provide the nexus for data collection through mandating the registration of DER and the associated data requirements through their contracts with customers by incorporating requirements into MSOs.
- It was noted that at times the equipment installed can be different to that which was previously identified in the connection agreement. For this reason, it is better not to rely on connection agreement data but rather to require the installer to record site information recorded in the DER Register.
- Request to have definitions of the variables, or a glossary, in the issues paper. When commenting on the data model, it is important to ensure that everyone is speaking about the same thing. There was a specific request to define ‘export’. (AEMO is supportive of this and will include an ‘intended definitions’ within the consultation material).
- Operational and data structure considerations should also reflect where the connection occurs in an installation, how DER devices are embedded and controlled, how they are coupled (AC or DC coupled).
- DNSPs noted that it is an onerous process to keep the data clean and updated – the DER Register will need to be updated each time that there are changes made at site. E.g. replacement of inverters each 10 years, customers adding new DER devices (such as batteries), or replacing DER devices due to damage or failure. There was broad discussion / questions raised about the need for DNSPs to update existing DER information in the Register and how this might be managed. It also led to some questions as to whether the DER Register became the system into which DNSPs would

interact / enter data directly or whether they would enter data into their own systems and then upload this into the Register. Some DNSPs noted that they had invested in existing systems, whilst other DNSPs may not have. These options will be explored in future meetings and within the issues paper.

- AusGrid – preference to keep inverter capacity and solar capacity in the DER Register, rather than just the aggregate system capacity. In some cases, the inverter may be over-specified for the solar that is connected. In this case, having the solar capacity may be more useful in the development of forecasts.

3.3. Use cases

- In some cases, the DER device and inverter are the same system (e.g. some current battery systems). AEMO should think about reducing duplication of this data across multiple tables.
- There may be many inverters in a system. AEMO should consider whether the DER Register will group inverters of the same characteristics together, the same way that they have proposed to group DER devices of the same characteristics.
- Question about how a 1MW landfill generator might be included as an AC connected device (machine-connected device).
- There was some discussion that a generic structure which accommodated a wide range of use cases might be more valuable.

3.4. Collection strategy (high level)

- There was interest from DNSPs in discussing how the collection process could be managed, what the architecture would be for the process to improve data quality and to make it 'easy' for installers to improve compliance (this will be the subject of a further meeting).
- There was general discussion about the unique opportunity that this rule change presents to improve the collection and data quality for DER via the provision (potentially) of a user-friendly App that can be used by all installers throughout Australia to directly register their installations and all data will be collected. There was strong agreement that ONE process should be developed and adopted by all states. There was general agreement that this approach was considered to be a potentially cost-effective solution for stakeholders.
- Currently a variety of collection methods. Some web portal, etc. Some DNSPs have already budgeted for these changes and progressed in either their thinking or investment in system changes to facilitate the new DER Register. Need to take this into consideration when designing a strategy for collection and system access.
- Many on the call were supportive of a single portal/ unified approach to the collection of data via installers, similar to how the Clean Energy Regulator information is collected.
- There is a need to make the physical collection of information easy for installers. This will likely lead to better data quality and compliance.
- Agreement that a separate meeting and agenda are needed to facilitate further discussion.
- Using DNSPs application process will place additional burden on customers and will not provide the best data integrity as the final installation is often only locked in at installation.

- DNSPs can incorporate their specific settings and other connection requirements into their own Permission to Connect processes and include the requirement to Register and provide data into a Central Register.

3.5. Next steps

- Meeting for data collection process.
- Issues paper and draft data model released for consultation.

4. Next meeting

The next DER REGISTER: NSP MEETING ON DATA COLLECTION meeting is scheduled for Friday, 1 February 2019 at 09.30am (AEDT).

The meeting closed at 12.40 (AEDT).

Data updates raised in the meeting

The following tables were presented in the meeting. The comments reflect the discussions had in the meeting. A separate model will be released to reflect the table structure discussion (see section 3.1 above) in early 2019.

NMI table

Data Item	Field type	Mandatory?	Who will collect the data?	What will we use it for?	Questions	Comments from meeting
NMI	10 digit NMI(s)	Yes	DNISP	<ul style="list-style-type: none"> This will also allow database linkages to other attributes, such as address, postcode, etc. for aggregation purposes. In future, NMI data will be used in conjunction with other available fields. This makes this an important field to be able to link with DER information now. Grouping by NMI will also allow aggregation of DER into sub regions for connection point forecasting purposes. 		<ul style="list-style-type: none"> Generators can have multiple NMIs – how will this be treated?
Address	N/A	N/A	N/A	<ul style="list-style-type: none"> This data item includes all address fields, which comprise DPID, building name, flat number, flat type, floor number, floor type, house number, house number suffix, location descriptor, Lot Number, street name, street suffix, street type, Unstructured Address1, Unstructured Address2, Unstructured Address3, postcode, locality, and state. This information will be used to aggregate systems for public data, (e.g. postcode) and for grouping geographically similar systems for operational forecasting. 		
Classification Type	Pick list {residential, industrial, commercial}	Yes	Installer	<ul style="list-style-type: none"> Used for public reporting and insights. May be used for demand modelling, to understand different profiles for energy usage. 	<ul style="list-style-type: none"> Currently there is a customer classification code (CND_01), which has residential and commercial codes. AEMO currently, intends to extend this field to include industrial. Are there any issues with this approach? 	<ul style="list-style-type: none"> AEMO understands that the CER currently have these field options It was noted that this field may not be required in the Register given it was the FRMP that populates this field – suggestion that this be included in the NSDR

AC Connection table

Data Item	Field type	Mandatory?	Who will collect the data?	What will we use it for?	Questions	Comments from meeting
DERID	Alpha-numeric (serial number or assigned identifier)	Yes	AEMO/ installer/ DNSP	<ul style="list-style-type: none"> Unique identifier for each AC connected 'system' associated with a NMI. This is the point at which the system is coupling with the network. This should be the serial number for the connecting device (e.g. inverter) 		
Connection type	Pick list {inverter, etc}	Yes	Installer	<ul style="list-style-type: none"> Some DER devices may be AC connected and not need an inverter. If this field = yes, then all inverter-related information should be mandatory. 	<ul style="list-style-type: none"> What other connection types should there be? 	<ul style="list-style-type: none"> Need to make sure fields support all possible generators – what fields are required?
Make	Pick list	Yes	Installer	<ul style="list-style-type: none"> May be used to pre-populate attributes, which are standard for particular make/models. Used for operational processes and power system studies, constraint equations, settings for emergency control schemes, etc. 	<ul style="list-style-type: none"> Should Make, Model and manufacturer be 3 fields or 1 combined field? 	
Model	Pick list	Yes	Installer	<ul style="list-style-type: none"> see cell above 		
Manufacturer	Pick list	Yes	Installer	<ul style="list-style-type: none"> see cell above 		
Export Capacity (kW)	Numeric	Yes	Installer	<ul style="list-style-type: none"> Used in Operational demand, maximum demand calculations and power system studies. This will give an indication of the maximum AC capacity of DER that can be connected to the grid. 		
Export Capacity (kVA)	Numeric	Yes	Installer	<ul style="list-style-type: none"> see cell above 		<ul style="list-style-type: none"> Remove field: Preference to remove duplication/ superfluous fields. Only have one type of export capacity, either kVA or kW.
Export Limit	Numeric	Yes	DNSP	<ul style="list-style-type: none"> Used in operational demand, maximum demand calculations and power system studies to estimate the impact of DER on net system load 	<ul style="list-style-type: none"> How are these applied? For example, is it at the meter/ connection point or at the inverter level? Is this different for different jurisdictions? 	
Runback scheme applied?	Yes/ no	Yes	DNSP	<ul style="list-style-type: none"> Run back scheme is implemented to limit generation output following the relevant network contingency events. If DER are part of a run-back 	<ul style="list-style-type: none"> Can there be more than one runback scheme per NMI? 	<p>REMOVE field:</p> <ul style="list-style-type: none"> This variable is not currently relevant to the DNSP level.

Data Item	Field type	Mandatory?	Who will collect the data?	What will we use it for?	Questions	Comments from meeting
				scheme and may trip off following an event, then this will be an important input to power system studies	<ul style="list-style-type: none"> Should a runback scheme be recorded at the NMI/ meter level or at the AC connection/ inverter level? 	<ul style="list-style-type: none"> AusGrid have some DNSP level runback schemes, however have not currently deployed any of these. Suggestion to have this field default to null until it is more readily used → preference not to have superfluous fields in the Register. This field may also introduce confusion. Runback schemes tend to be enabled after a contingency, however people may put in the export limit rather than the runback scheme. Powercor: Run back scheme are not required for LV distribution connected DER
Name of runback scheme	Free text/ pick list	If Runback scheme applied = yes	DNSP	<ul style="list-style-type: none"> See cell above 		
Status	Pick list {active, inactive}	Yes	Installer	<ul style="list-style-type: none"> This status will encompass the installation date, decommissioning date and status of the installation. When a new record is inserted in the database, the installation date/ start date is defined by the user and may be backdated. Used for power system studies, demand forecasting (ESOO), insights and public reporting. Used to see the uptake of DER devices, discern trends, forecast according to insights, etc. 		
What standard applies	Pick list	If inverter connected = yes	DNSP	<ul style="list-style-type: none"> Used in AEMOs dynamic power system studies to understand how different units respond in our models. For example, understanding aggregate behaviour of the DER fleet during disturbances. 		<ul style="list-style-type: none"> Installers to enter what installation standard was applied at site
Inverter enabled modes of	Pick list {DRM0, DRM1, DRM2, DRM3, DRM4,	If inverter connected = yes	DNSP	<ul style="list-style-type: none"> See cell above 	<ul style="list-style-type: none"> Can more than one response mode be 	<ul style="list-style-type: none"> See Inverter enabled modes of operation - response modes comment.

Data Item	Field type	Mandatory?	Who will collect the data?	What will we use it for?	Questions	Comments from meeting
operation - demand response modes enabled and enablement method	DRM5, DRM6, DRM7, DRM8}				enabled on a single inverter? Yes	
Inverter enabled modes of operation - response modes	Pick list {Power response (Frequency control) mode; Voltage response mode (watt-voltage or var-voltage); Q (Reactive power) control mode; PF (Power factor) control mode; stand-alone mode}	If inverter connected = yes	DNSP	<ul style="list-style-type: none"> See cell above. For example, the volt-var response mode assists with connection point management by adjusting the reactive current that is injected to the grid as a function of voltage. The implementation of this control assists with the reliable operation of customer inverters and reduces the risk of loss of generation. 	<ul style="list-style-type: none"> Can more than one response mode be enabled on a single inverter? Yes 	<p>NEW FIELD:</p> <ul style="list-style-type: none"> It would be beneficial to know not only if a response mode is enabled, but also what type. For example, volt response modes may be programmed for different response values under AS4777.2 which are denoted V1, V2, V3 and V4. AEMO to look at AS4777 and update these fields accordingly.
Under-frequency trip settings	Pick list {Yes, No} or numeric value or null	Yes	DNSP	<ul style="list-style-type: none"> Load response to system disturbances is important to the ability to manage power system security, as AEMO needs to understand how load, in aggregate, will respond to these events. Many DER are connected to the network via power electronic inverters which are programmed to disconnect from the network if voltage or frequency reaches certain thresholds. Without visibility of how these DER are pre-set to respond, AEMO cannot plan efficiently for contingency events, and will not know whether large penetrations of DER will present challenges to preventing blackouts, or in the worst case, a black system following non-credible or multiple credible contingency events. 		<p>NEW FIELD:</p> <ul style="list-style-type: none"> Related to Over Frequency, under frequency, over voltage and under voltage trip settings. Most of these settings have hard limits in AS4777.2, with the exception of over-voltage trip settings, which is a range in the standards, but should have the 10 min average trip setting set by the DNSP. These fields should move to the DER Installation/ Aggregate system table.

Data Item	Field type	Mandatory?	Who will collect the data?	What will we use it for?	Questions	Comments from meeting
Over-frequency trip settings	Pick list {Yes, No} or numeric value or null	Yes	DNSP	<ul style="list-style-type: none"> See cell above 		See under-frequency trip setting comment.
Under-voltage trip settings	Pick list {Yes, No} or numeric value or null	Yes	DNSP	<ul style="list-style-type: none"> See cell above 		
Over-voltage trip settings	Pick list {Yes, No} or numeric value or null	Yes	DNSP	<ul style="list-style-type: none"> See cell above 		

DER Device table

Data Item	Field type	Mandatory?	Who will collect the data?	What will we use it for?	Questions	Comments from meeting
Device ID	Alpha-numeric (serial number or assigned identifier)	Yes	AEMO/ DNSP/ Installer	<ul style="list-style-type: none"> Child relationship to DERID. Unique identifier for a group of DER devices with the same attributes. 		
Number of devices	Numeric	Yes	Installer	<ul style="list-style-type: none"> Number of devices in this group. Note the devices must have the same attributes. 		
Make	Pick list	Yes	Installer	<ul style="list-style-type: none"> May be used to pre-populate attributes, which are standard for particular make/models. Used in operational processes and power system studies, constraint equations, settings for emergency control schemes, etc. 		
Model	Pick list	Yes	Installer	<ul style="list-style-type: none"> see cell above 		
Manufacturer	Pick list	Yes	Installer	<ul style="list-style-type: none"> see cell above 		
Status	Pick list {active, inactive}	Yes	Installer	<ul style="list-style-type: none"> This status will encompass the installation date, decommissioning date and status of the installation. When a new record is inserted in the database, the installation date/ start date is defined by the user and may be backdated. Used for power system studies, demand forecasting (ESOO), insights and public reporting. Used to see the uptake of DER devices, discern trends, forecast according to insights, etc. 		

Data Item	Field type	Mandatory?	Who will collect the data?	What will we use it for?	Questions	Comments from meeting
Device Type	Pick list	Yes	Installer	<ul style="list-style-type: none"> High level fuel descriptor. includes all descriptors from 'fuel source descriptor' tab. E.g. Solar, Wind, Battery, etc. Used for aggregation purposes for the DER Register Report. Different technologies require different forecasting models to reflect the diversified or undiversified nature of the resource. E.g. solar PV within a 10km radius is typically subject to similar weather patterns. 		
Device sub-type	Pick list	Yes	Installer	<ul style="list-style-type: none"> More granular description, e.g. solar technology, battery chemical composition, etc. Used for aggregation purposes for the DER Register Report. Different technologies require different forecasting models to reflect the diversified or undiversified nature of the resource. E.g. solar PV within a 10km radius is typically subject to similar weather patterns. 		
Capacity (kW)	Numeric	Yes	Installer	<ul style="list-style-type: none"> Used in AEMOs operational forecasting systems to estimate solar PV response in short term demand forecasts. This is currently estimated using the PVOutput.org data, however having a more complete dataset through the DER Register will improve the accuracy of these estimates. 		
Capacity (kVA)	Numeric	Yes	Installer	<ul style="list-style-type: none"> See cell above 		Remove field: Preference to remove duplication/ superfluous fields. Only have one type of export capacity, either kVA or kW.
Storage capacity (kWh)	Numeric	If device type is storage	Installer	<ul style="list-style-type: none"> See cell above 		
Panel orientation	Numeric (degrees)	If device type is solar	Installer	<ul style="list-style-type: none"> Provides indication of panel efficiency or capacity of solar panels. 	<ul style="list-style-type: none"> Panel tilt and orientation were raised in the pre-consultation workshop. Would these variables be of use to DNSPs? 	Remove field: <ul style="list-style-type: none"> No business case for keeping panel tilt and orientation. Strong preference in the meeting to only capture variables that will be used. Powercor noted that they

Data Item	Field type	Mandatory?	Who will collect the data?	What will we use it for?	Questions	Comments from meeting
						<p>agree that panel tilt and orientation is not required as we have actual data on an aggregate level.</p> <ul style="list-style-type: none"> • Other suggested variables include tracking slope angle and azimuth angle. • Installers estimated efficiently of system may be a more appropriate field.
Panel tilt	Numeric (degrees)	If device type is solar	Installer	• See cell above		Remove field: Preference to remove duplication/ superfluous fields. Only have one type of export capacity, either kVA or kW.
What standard applies?	Drop down menu	Yes	DNSP	<ul style="list-style-type: none"> • Important to quantify how DER respond in AEMO models, e.g. understanding ride through for disturbances. 		