

# DER Register - Data Model

Roy Kaplan  
Emerging Markets and Services  
AEMO

# AEMO's DER Register

# Rule obligations

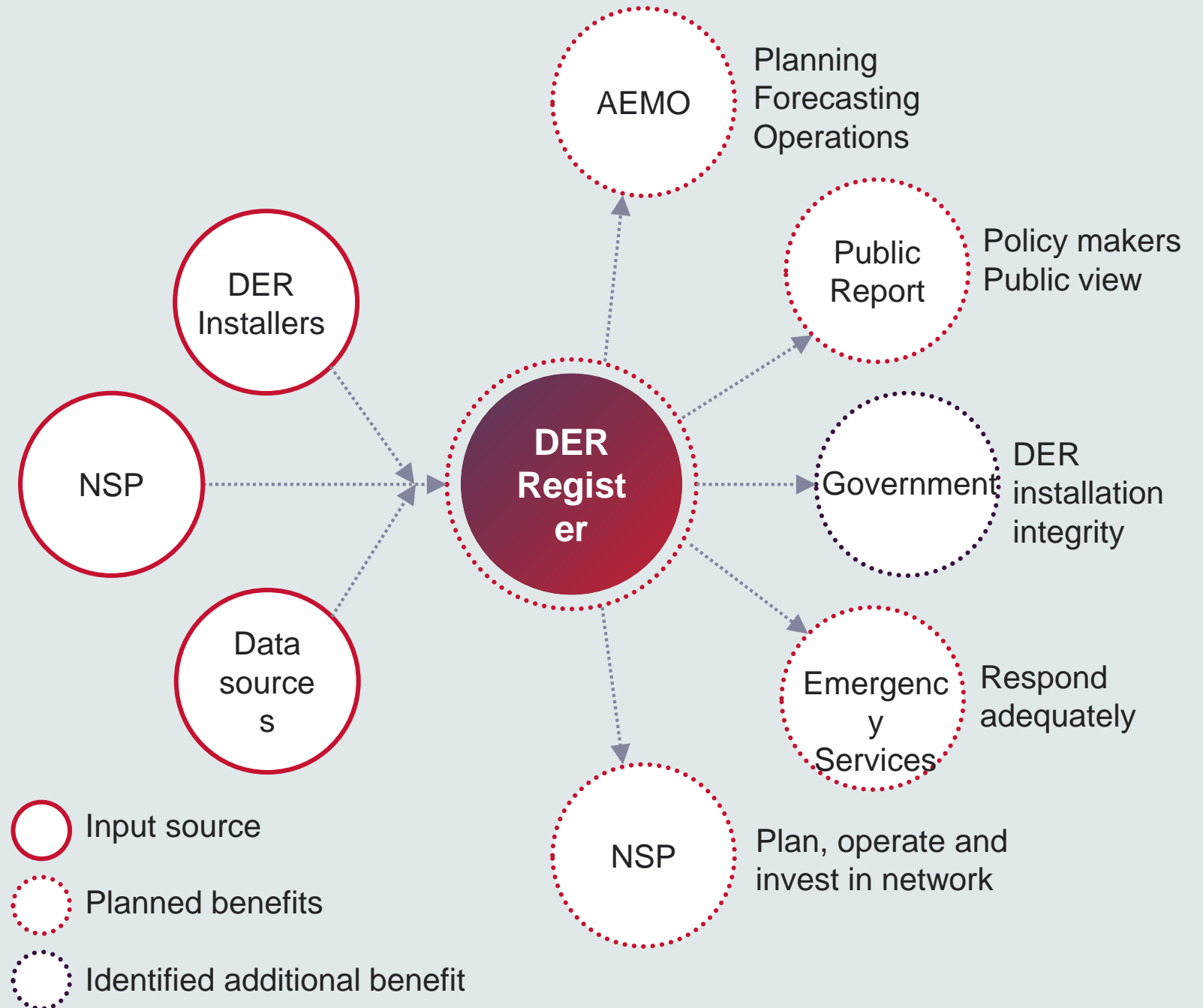
Rule made on 13 September 2018 places obligations on AEMO and NSPs

AEMO obligations	NSP obligations
<ul style="list-style-type: none"><li>a) Establish, maintain and update a DER Register</li><li>b) Develop, maintain and publish DER Register Information Guidelines</li><li>c) Share disaggregated data with NSPs</li><li>d) DER Register Report on website</li><li>e) Consider DER information in load forecasts</li><li>f) Share information with emergency services</li></ul>	<ul style="list-style-type: none"><li>a) Adhere to AEMO's DER Register Information Guidelines (definition of 'small generator information')</li><li>b) Collect and submit 'small generator information' as it relates to 'connection points'</li><li>c) Update connection frameworks to support provision of information from connection applicants</li><li>d) Provide AEMO with their known information about existing DER in their network</li></ul>

# DER Register

*A national database of DER assets to enable the realisation of consumer value and enhance power system reliability via DER installed in homes and businesses across Australia*

*Implemented and operational from 1 December 2019*



# Overview of roles

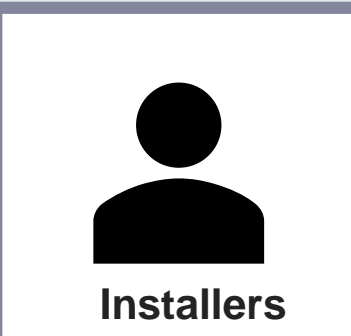
*DER Register builds on current connection frameworks*



- Establish and maintain DER Register
- Collecting and storing DER Register data
- Provide access for other parties (NSPs, emergency services)



- Connection process, including application assessment, approval and agreements (unchanged)
- Accountable for providing data to AEMO
- Confirm DER register information, including exception handling

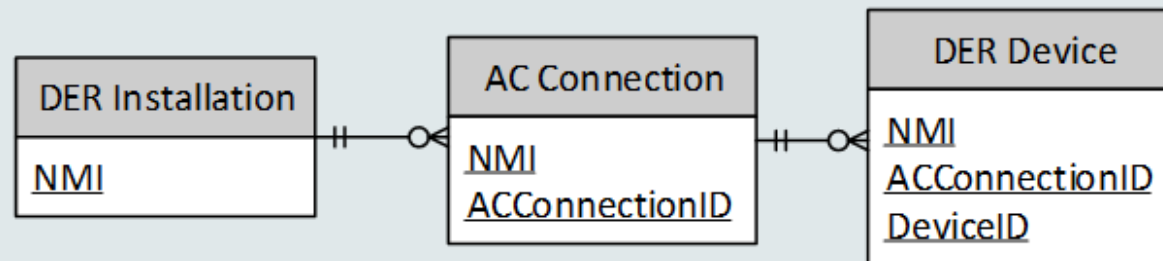


- Install equipment as per approval
- Provide information for connection approval, and about equipment installed in site
- Confirming information submitted








# Data model

Level	Description
Installation	<ul style="list-style-type: none"><li>• This level applies to the aggregate DER installation at a customer's premises (or NMI)</li><li>• Each NMI may have many DER Installations referenced to it, but each Installation may only be associated with 1 NMI</li></ul>
AC Interface	<ul style="list-style-type: none"><li>• Contains information about inverters or groups of inverters (also applies to non-inverter DER)</li><li>• Contains information about the inverters, their protection and control settings and NSP-defined standards that apply</li><li>• Each AC connection may have one or many DER devices related to it</li></ul>
Device	<ul style="list-style-type: none"><li>• Contains information relating to the DER Device such as solar panels or battery cells, or groups of these devices</li><li>• A DER device may be one or many devices that have exactly the same specifications</li></ul>

## Relationships between levels



# Data

Level	Data types	Expected source of data	
		Network	Installer
Installation	Approved capacities, technologies and central control/protection (e.g. export limits)	✓	
	Installer licence number / ID		✓
AC interface	Inverter or generator manufacturer, model, serial number and capacities, and numbers of installed units		✓
	Inverter control modes and settings (e.g. volt-watt etc)	✓	
	Non-inverter generation control modes, settings and protection	✓	
	Date of commissioning	✓	
Device	Device (e.g. solar PV panels or battery) manufacturer, model and capacities, and numbers of installed units		✓

Data source



Review



# Level 1: NMI-level data

☐ These fields are mandatory for the historic data load

Data field	Expected source
NMI <input type="checkbox"/>	NSP to provide
Approved capacity <input type="checkbox"/>	NSP to provide
Installer identification (licence number or equivalent)	Installer to provide
Connection Agreement 'Job number'	NSP to provide
Number of phases available	NSP to provide
Islandable Installation	NSP to provide
Number of phases with DER installed	NSP to provide
<b>Central protection and control</b>	<b>NSP discretion</b>
Under-frequency protection (F<)	NSP to provide if in use
Under-frequency protection delay(F<)	NSP to provide if in use
Over-frequency protection (F>)	NSP to provide if in use
Undervoltage protection (V<)	NSP to provide if in use
Undervoltage protection delay (V<)	NSP to provide if in use
Overvoltage protection 1 (V>)	NSP to provide if in use
Overvoltage protection 1 delay (V>)	NSP to provide if in use
Overvoltage protection 2 (V>>)	NSP to provide if in use
Rate of Change of Frequency (RoCoF)	NSP to provide if in use
Voltage Vector Shift	NSP to provide if in use
Neutral voltage displacement	NSP to provide if in use



# Level 2: AC Connection level

Data field	Expected source
Number of AC Connections <input type="checkbox"/>	NSP or Installer to select/confirm
AC equipment type (inverter or no inverter) <input type="checkbox"/>	NSP to provide
Inverter/ small generating unit manufacturer	Installer to provide to NSP / system (via CEC database)
Inverter Model Number	Installer to provide to NSP / system (via CEC database)
Inverter Series	Installer to provide to NSP / system (via CEC database)
Inverter serial number	Installer to provide from site
Commissioning date <input type="checkbox"/>	NSP to confirm in record
Status code <input type="checkbox"/>	NSP or Installer to select/confirm
Inverter device capacity (kVA) <input type="checkbox"/>	Installer to provide to NSP / system (via CEC database)
What standard(s) apply to the inverter?	Installer to provide to NSP / system (via CEC database)
Vnom-max (sustained operation overvoltage limit)	Doc: MDI0043
Fstop (over-frequency)	Doc: MDI0043
Fstop-CH (under frequency)	Doc: MDI0043
Inverter - DRED interaction	Installer to provide
<b>Inverter voltage response mode - volt-watt response</b>	<b>NSP Discretion</b>
Settings	Defined by NSP standards / Installer can edit
<b>Inverter voltage response mode - volt-var response</b>	<b>NSP Discretion</b>
Settings	Defined by NSP standards / Installer can edit
<b>Inverter reactive power mode</b>	<b>NSP Discretion (disabled)</b>
Settings	not in use
<b>Inverter fixed power factor mode</b>	<b>NSP Discretion (disabled)</b>
Settings	not in use
<b>Inverter power factor curve/power response mode</b>	<b>NSP Discretion (disabled)</b>
Settings	not in use
<b>Inverter power rate limit mode (AC operation &amp; control)</b>	<b>NSP Discretion (disabled)</b>
Settings	not in use
<b>Inverter volt-watt response for energy storage systems</b>	<b>NSP Discretion (disabled)</b>
Settings	not in use
<b>Non-inverter generator - voltage/reactive power regulation</b>	<b>NSP Discretion</b>
Settings	Negotiated with NSP per connection agreement
<b>Non-inverter generator ramp rate</b>	<b>NSP Discretion</b>
Settings	Negotiated with NSP per connection agreement
<b>Non-inverter generator frequency response mode</b>	<b>NSP Discretion</b>
Settings	Negotiated with NSP per connection agreement
<b>Protection and control modes</b>	<b>NSP Discretion</b>
Settings	NSP to provide

# Level 3: Device level

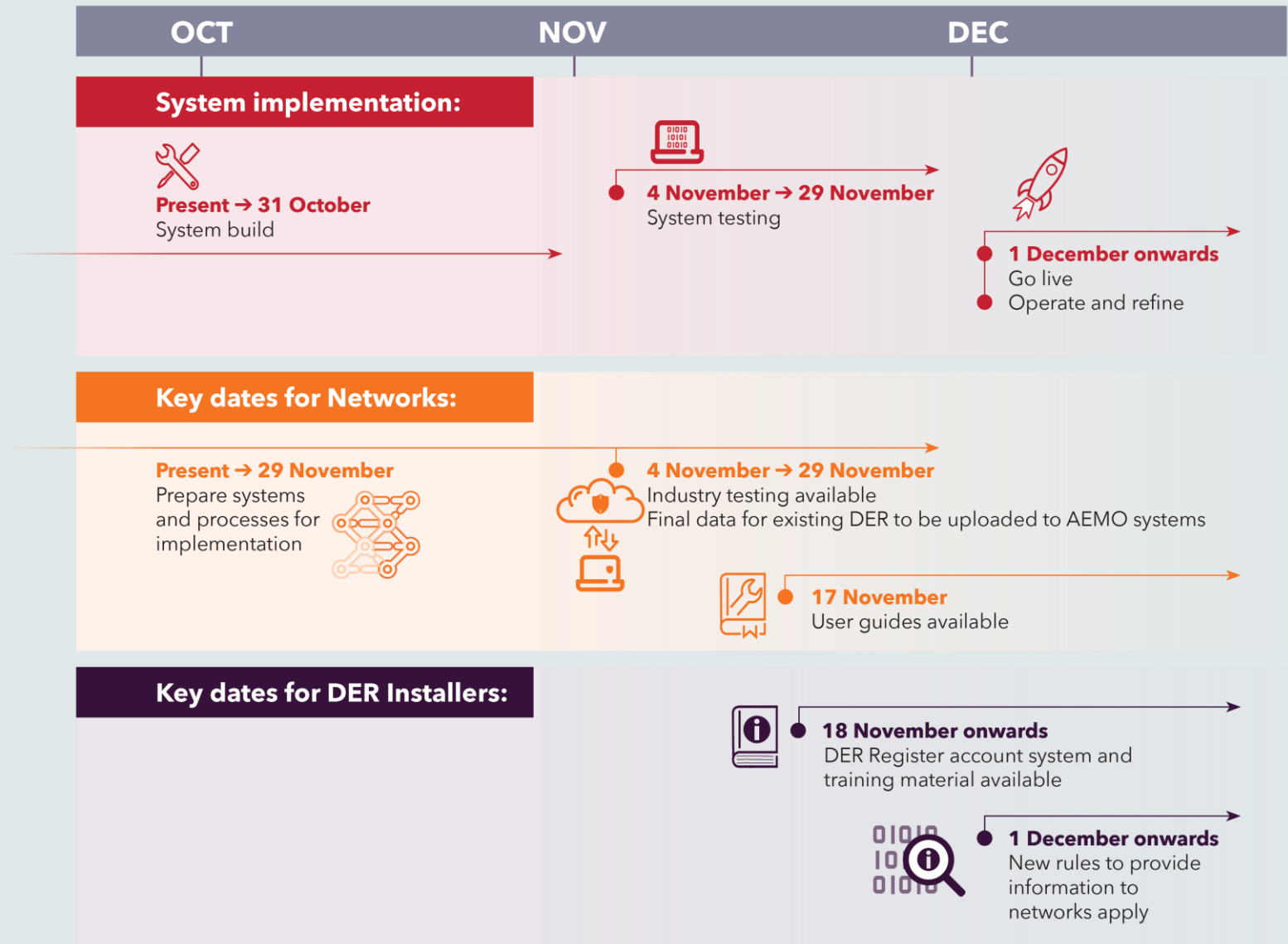
- These fields are mandatory for the historic data load

Data field		Expected source
Number of devices	□	NSP or Installer to select/confirm
Manufacturer		Installer to provide to NSP / system (via CEC database)
Model Number		Installer to provide to NSP / system (via CEC database)
Status	□	NSP or Installer to select/confirm
Device Type	□	NSP to provide
Device sub-type	□	NSP or Installer to select/confirm
Nominal rated capacity (kW)	□	Installer to provide to NSP / system (via CEC database)
Nominal storage capacity (kWh)	□	Installer to provide to NSP / system (via CEC database)

# Next steps

# Next steps

*Timeline and expectations going forward*



Queries: [DERRegister@aemo.com.au](mailto:DERRegister@aemo.com.au)

Information: <https://aemo.com.au/Electricity/National-Electricity-Market-NEM/DER-program/DER-Register-Implementation>

# DER Program

