

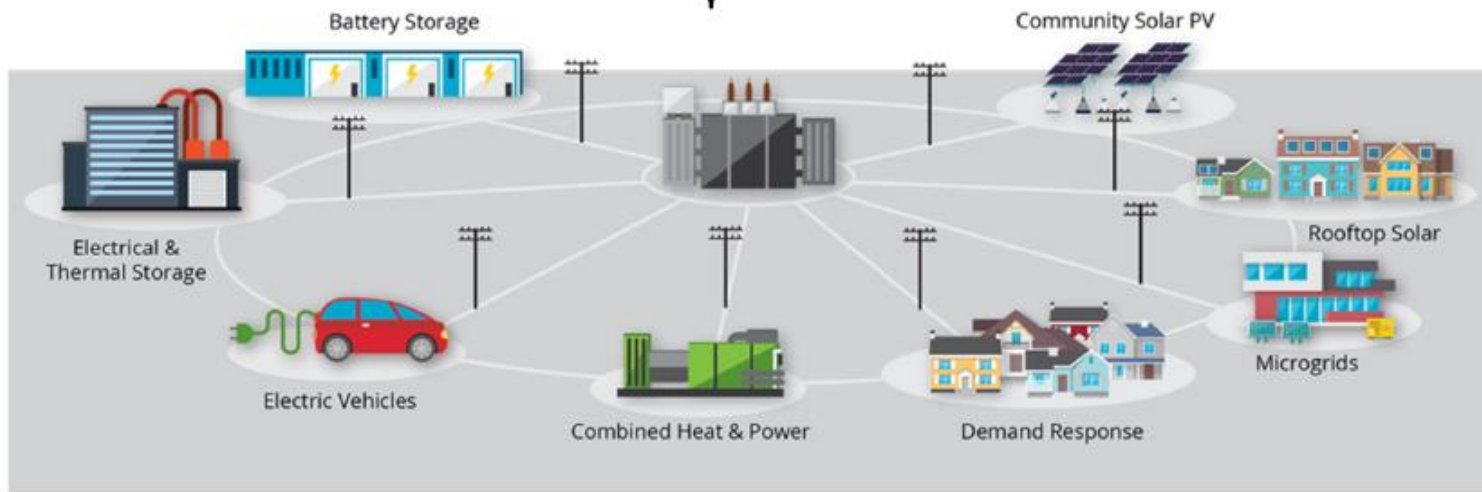
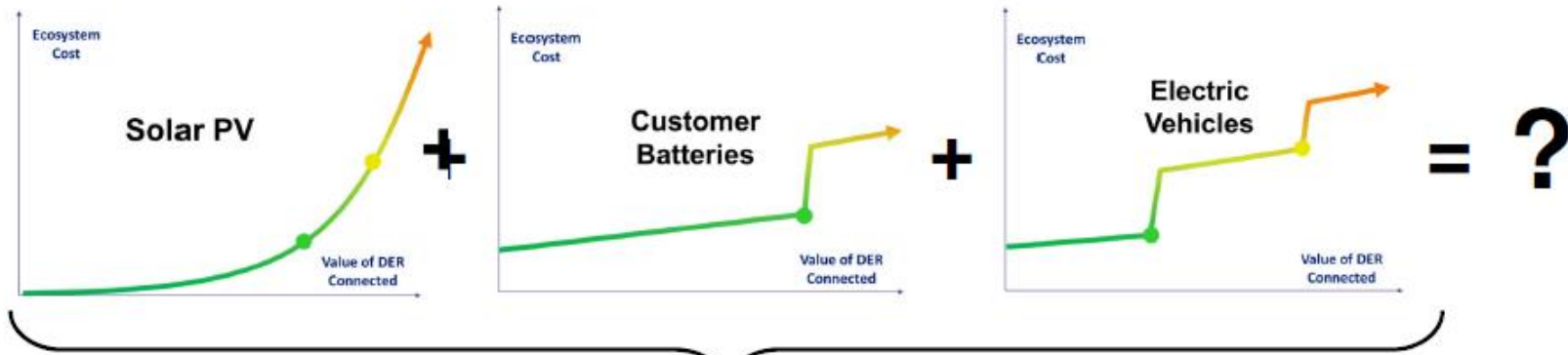
19 November 2019

Part 6 hosting capacity and DER

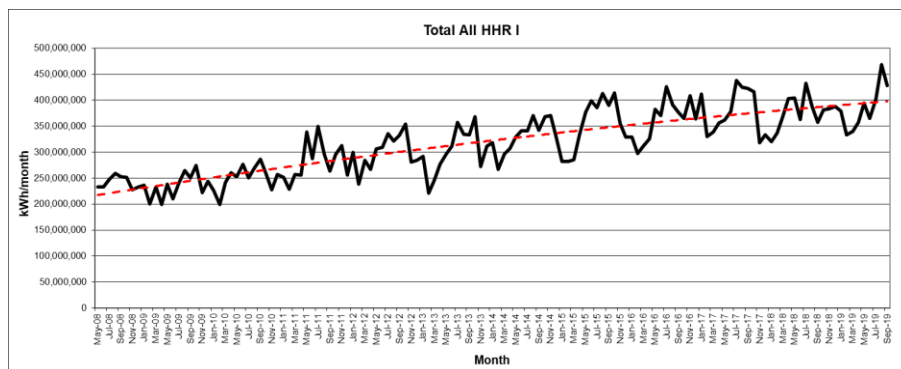
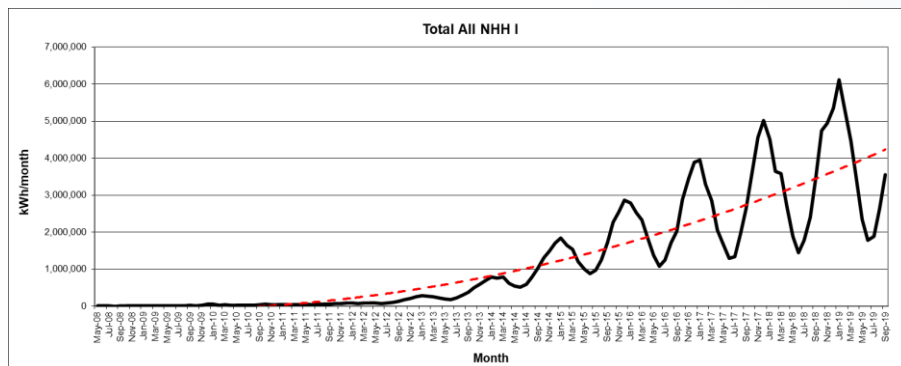
Open Networks workshop

Ron Beatty, Principal Adviser Market Services

The developing DER Marketplace (ecosystem) utilises distributed generation as well as discretionary load



Embedded generation

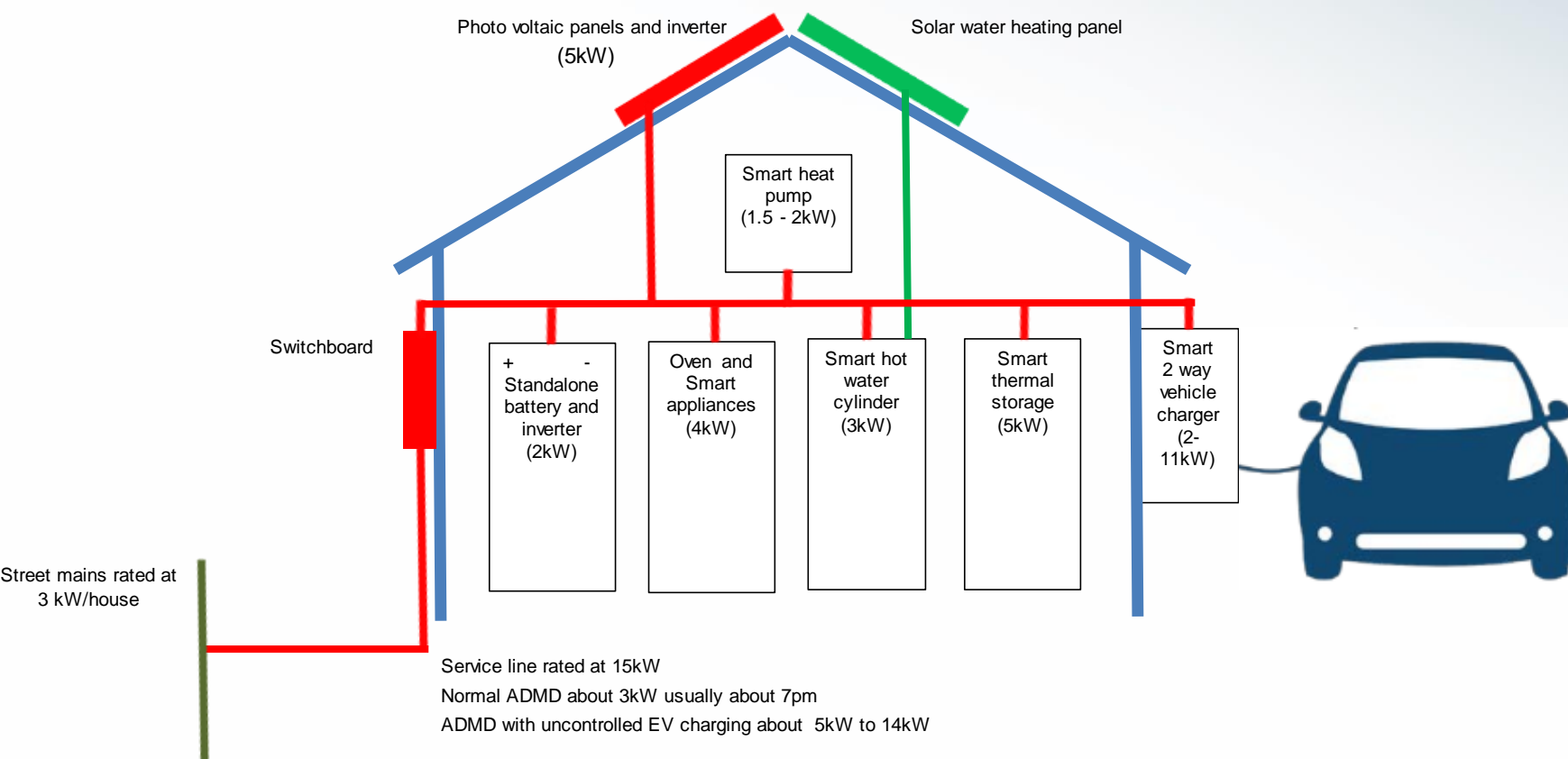


- NZEM only recognises surplus generation injected into a network
- Embedded generation records held in registry as at 30/09/2019
 - 835 >10kW (1,439.585 MW, 14.866 MW is solar)
 - 25,465 <10kW (95.747 MW, 91.245 MW is solar)
- Rate of increase varies per month between
 - 300 and 500 ICPs
 - 1.5 MW and 3 MW
- Regulated connection process in Part 6 of the Code to ensure efficient connection and also to ensure congested areas do not cause power quality issues
- Concern over “virtual power plant” impacts on grid reliability

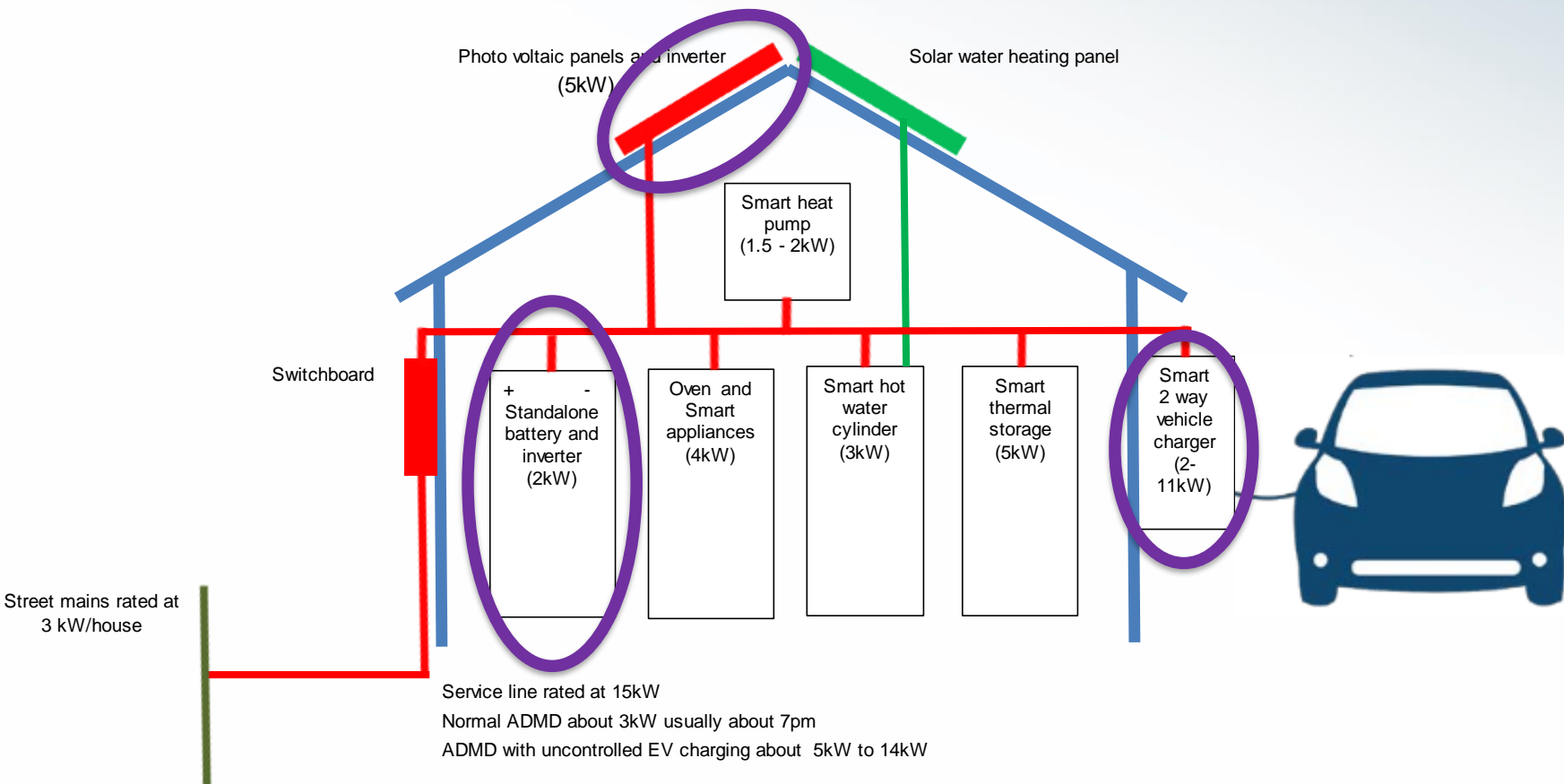
We are consulting on changes to Part 6 – distributed generation

- Part 6
 - does not regulate how distributed generation is used
 - is a standard intended to reduce barriers to the connection of distributed generation, regardless of the type of distributed generation
 - provides transparency where distributed generation resources are located
- Part 6 regulates anyone that **injects electricity into a local or embedded network**
- Part 6 is agnostic to the fuel form and includes PV, batteries, wind turbine, engines, hydro, fuel cells, V2G EV chargers, and microgrids (where operating as a customer network)
- There are other Code requirements for metering, switching electricity market reconciliation and network charge reconciliation that are not being altered

In the home, Part 6 of the Code regulates.....



In the home Part 6 of the Code regulates.....



Regulatory requirements - distributed generation

- Part 6 - regulates contracts and connection pricing
 - Requires distributed generators to seek the consent of the network before connecting
 - includes 3 distributed generation application processes
 - Part 1A - <10kW – application requirements being modified by current consultation
 - Part 1 - <10kW – application requirements not being modified
 - Part 2 - >10kW – application requirements not being modified
 - requires compliance of inverters
 - references distributors “connection and operation standards”
- Part 8 - Clauses 8.21 and 8.25) SO has additional requirements for inverters greater than 1MW
- The proposed Code amendment impacts only the Part 1A process

Current Part 6 consultation

- Takes into account learnings from the Australian experience of large scale connection of PV such as
 - high and fluctuating network voltages
 - network congestion
 - potential issues with fault ride through impacting security and reliability
- The Authority's current concerns with Part 6 are
 - first in first served based on capacity
 - the Part 1A process could better address connection applications to parts of the network subject to export congestion
- The proposal is a low cost no-regrets approach to avoid the <10kW distributed generation issues evident in Australia
 - impacts only distributed generators that follow only the Part 1A application process
 - discusses integration of power response modes and hosting capacity into the requirements for distributed generators that use the Part 1A application process

The proposed Code amendment

- May be a temporary move to prevent network congestion until future requirements are firm
- Allows distributors to require settings on inverters using the Part 1A application process
- Requires an assessment of the capability of a section of network to convey electricity
 - different capability for different voltage tiers, designs and capacities
 - allocates available capacity on a network so that all users receive a share of capacity
 - can defer network capital expenditure until future requirements become clear
 - enables autonomous dispatch of inverters installed under the Part 1A process
- References distributors connection and operation standards for inverter settings
- Increased DER requirements beyond determined hosting capacity, or the use of different standards of inverters remain the networks discretion using the Part 1 and Part 2 application processes

Amending definition of connection and operation standards

connection and operation standards, in relation to a **distributor** or **distributed generation**,—

(a) means requirements, as amended from time to time by the **distributor**, that—

- (i) are set out in written policies and standards of the **distributor**; and
- (ii) relate to connecting **distributed generation** to a **distribution network** or to a **consumer installation** that is connected to a **distribution network**, and the operation of the **distribution network**, including requirements relating to the planning, design, construction, testing, inspection, and operation of **distributed generation** that is, or is proposed to be, connected; and
- (iii) are made publicly available in accordance with clause 6.3; and
- (iv) reflect, or are consistent with, **reasonable and prudent operating practice**; and

(b) includes the following, as amended from time to time by the **distributor**:

- (i) the **distributor's congestion management policy**, as referred to in clause 6.3(2)(d); and
- (ii) the **distributor's** emergency response policies; and
- (iii) the **distributor's** safety standards; and

(c) may include the **distributor's** policies for specifying available **maximum export power** amongst categories of **network** users, a **maximum export power** threshold for applications under Part 1A of Schedule 6.1, and the methodology used to determine that threshold.

Adding a definition for maximum export power

maximum export power means the maximum active power exported into the local network or embedded network at an ICP of a distributed generator, and is equal to—

(a) the nameplate capacity of the distributed generation minus the minimum load at the point of connection; or

(b) the power export limit imposed by an active export control device.

Amending information that must be publicly available

6.3 Distributors must make information publicly available

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(d) a statement of the circumstances in which **distributed generation** will be, or may be, curtailed or interrupted from time to time in order to ensure that the **distributor's other connection and operation standards** are met; and

(da) a list of all locations on its **distribution network** that the **distributor**—

(i) knows to be subject to **export congestion**; or

(ii) expects to become subject to **export congestion** within the next 12 months; and

(db) for locations at which it has set a **maximum export power** threshold for applications under Part 1A of Schedule 6.1, the **maximum export power** threshold and the methodology used to determine it; and

Amending information that must be publicly available

1D When application may be made under Part 1A

A **distributed generator** may elect to apply to a **distributor** under Part 1A instead of Part 1 if the **distributed generation** to which the application relates—

- (a) is designed and installed in accordance with AS/NZS 4777.1:2016 and
- (b) incorporates an inverter that—
 - (i) has been tested and issued a Declaration of Conformity with AS/NZS 4777.2:2015 by a laboratory with accreditation issued or recognised by International Accreditation New Zealand; and
 - (ii) has the following volt response modes:
 - (A) volt-watt response mode; and
 - (B) volt-var response mode; and
 - (iii) has protection and volt response mode settings that meet the distributor's connection and operation standards; and
- (c) has an export power limit at the ICP of the distributed generator that meets the maximum export power, if any, specified by the distributor in its connection and operation standards.

Amending information that must be provided by the distributed generator

9B Application for distributed generation of 10 kW or less in total in specified circumstances

(2)

(e) confirmation as to whether the inverter—

(i) is included on the **distributor's** list of approved inverters made publicly available under clause 6.3(2)(f); or

(ii) conforms with the protection settings and volt response mode settings specified in the **distributor's connection and operation standards**:

(ea) confirmation that the **distributed generation** has a **maximum export power** limit that meets the **maximum export power** threshold, if any, specified by the **distributor** in its **connection and operation standards**:

(f) if the inverter is not included on the **distributor's** list of approved inverters, a copy of the AS/NZS 4777.2:2015 Declaration of Conformity certificate for the inverter:

(g) details of—

(i) the **nameplate capacity** of the **distributed generation**; and

(ii) the fuel type of the **distributed generation** (for example, solar, wind, or liquid fuel); and

(iii) the **maximum export power** of the **distributed generation**.

QUESTIONS

COMPETITION • RELIABILITY • EFFICIENCY