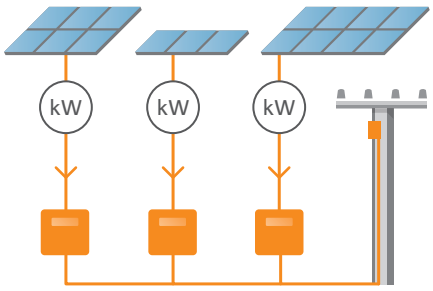
Cluster Rule for generators

SA Power Networks

Empowering South Australia

The 'Cluster Rule' is the process of aggregating individual generation units, to ascertain the collective network and customer impact.



The total size of the cluster will determine how SA Power Networks:

- process connection applications,
- undertake impact assessments, and
- prescribe technical requirements, namely protection, export limits and SCADA.

Based on feedback from our customers, SA Power Networks is applying the following to ensure all generation connections are processed fairly and consistently.

Definition of a cluster

A cluster is defined as:
The aggregation of generating units on the same title or adjacent titles of land when they are owned or operated by proponents that share an interest in the other generator(s), and/or the land, regardless of the number of NMIs or connection points.

The aggregated capacity of the cluster determines the connection process and impact assessment undertaken (refer to NICC270).

Requirement for back-up protection

In line with AS4777, one **Network Protection Unit (NPU)** is required for each connection point when >30kVA capacity of generating units are electrically connected beyond.

Requirements for control and monitoring

One SA Power Networks SCADA Remote Terminal Unit (RTU) is required for a cluster when:

- there is ≥200kW export from a parent NMI, or
- a capacity constraint is identified (which is one major item of plant out of service, such as a substation transformer).

When generating units are added to a cluster, an impact assessment of the full cluster will be undertaken. The requirement for SCADA will be considered as part of this new connection application.

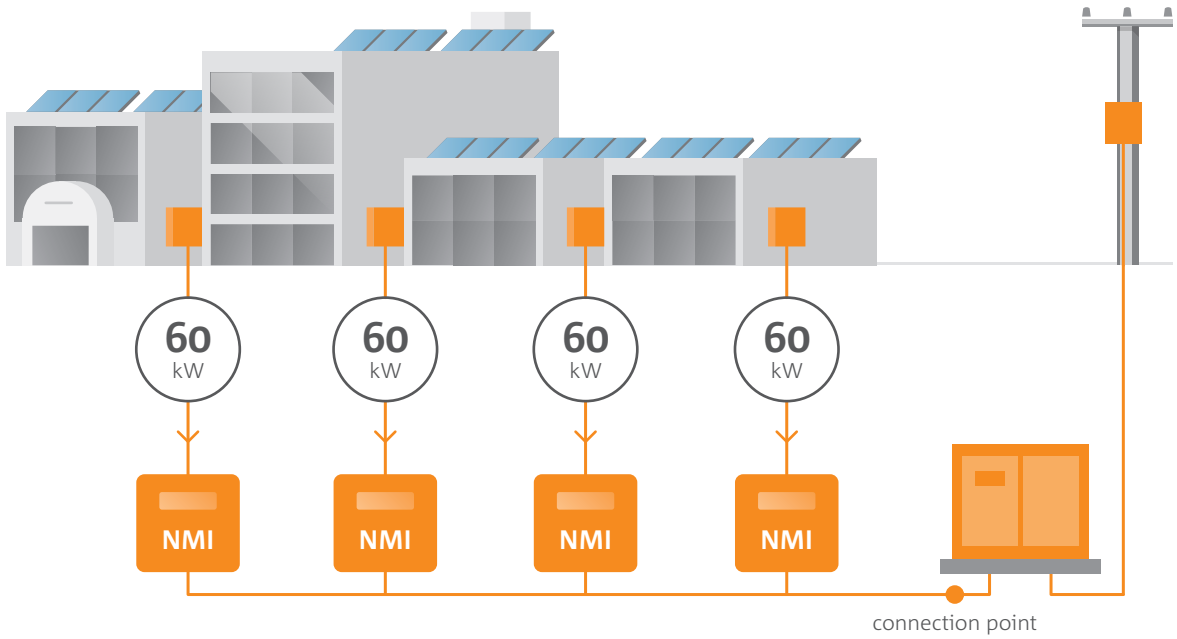
When a cluster comprises of only residential dwellings that are owned by proponents that do not share an interest, the cluster may be exempt from SCADA requirements.

Please refer to the following examples applying these principles.

Example 1a

Multiple generation systems on individual premises and NMIs behind a connection point

also shopping centres, schools, etc.



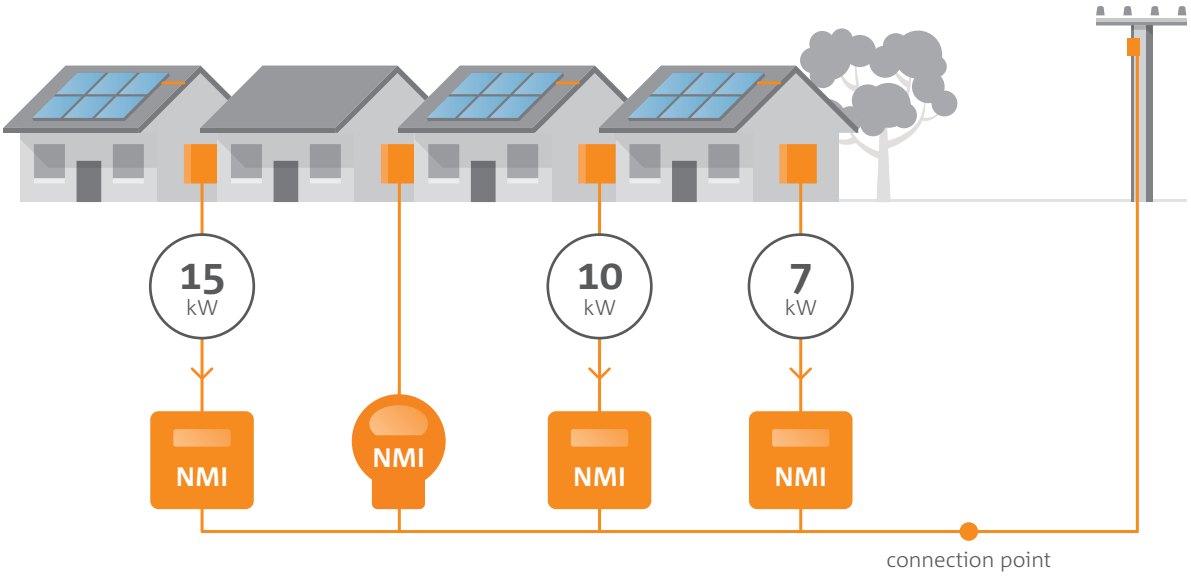
The connection is considered one clustered 240kW system as all inverters are on one single site. Each NMI connecting to the grid exports <200kW.

Assessed under	NPU	SCADA
3 × assessed under **31–200kW** process	**Up to 4 × NPUs required** (>30kVA)	**Not required** if no network constraint (if constraint, only required for that application)
Last assessed under **>200kW** process.	Or one central NPU, so all generating units are protected by an NPU	

Example 1b

Four residential dwellings, each connected behind individual NMIs on the same land

includes community title arrangements



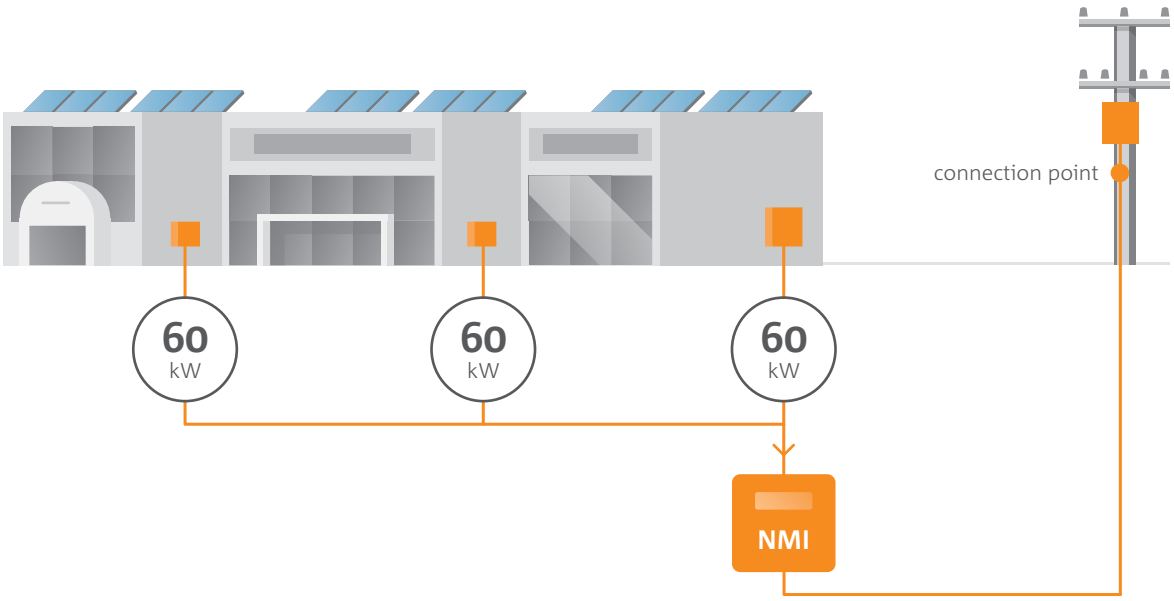
Each system contributes to the cluster.

Assessed under	NPU	SCADA
First assessed under **<30kW** process	**Required** (>30kVA)	**Requirement not assessed**
When >30kW, assessed under **31–200kW** process (and will be exempt from >200kW process)		

Example 2

Multiple individual premises, each with a generating system, under one NMI behind a connection point

regardless of individual tenants having individual meters



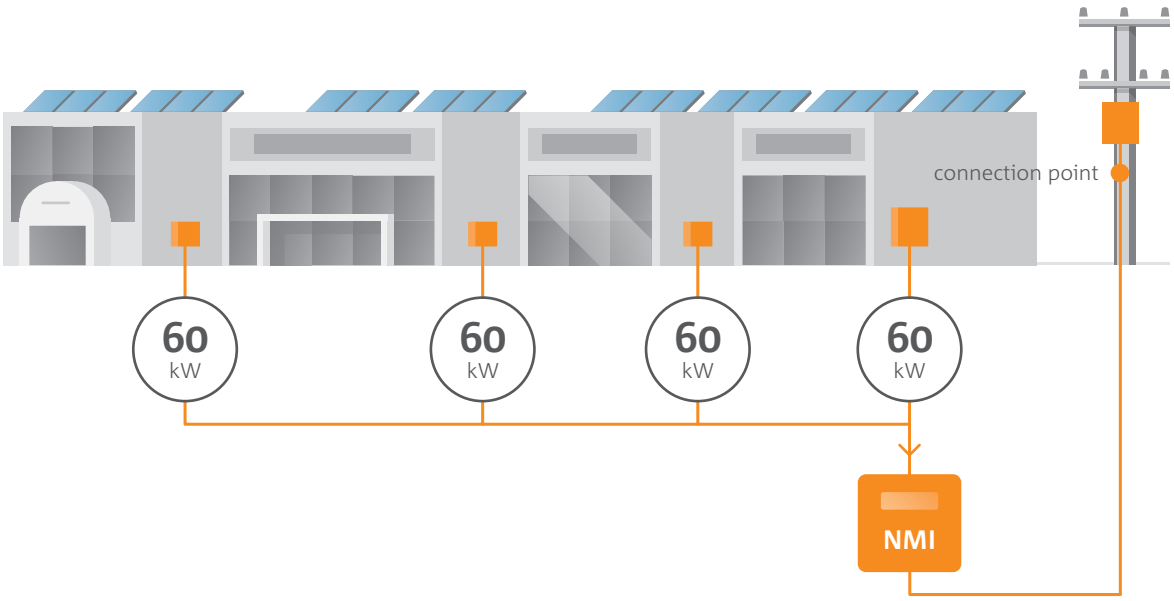
The connection is considered one clustered 180kW system as all inverters are on one single site, and there is one NMI connecting to the grid.

Assessed under	NPU	SCADA
31–200kW process	**Required** (>30kVA)	**Not required** if no network constraint (network constraints checked during the assessment)

Example 3

Four non-residential premises in a retail complex behind one NMI

regardless of individual tenants having individual meters



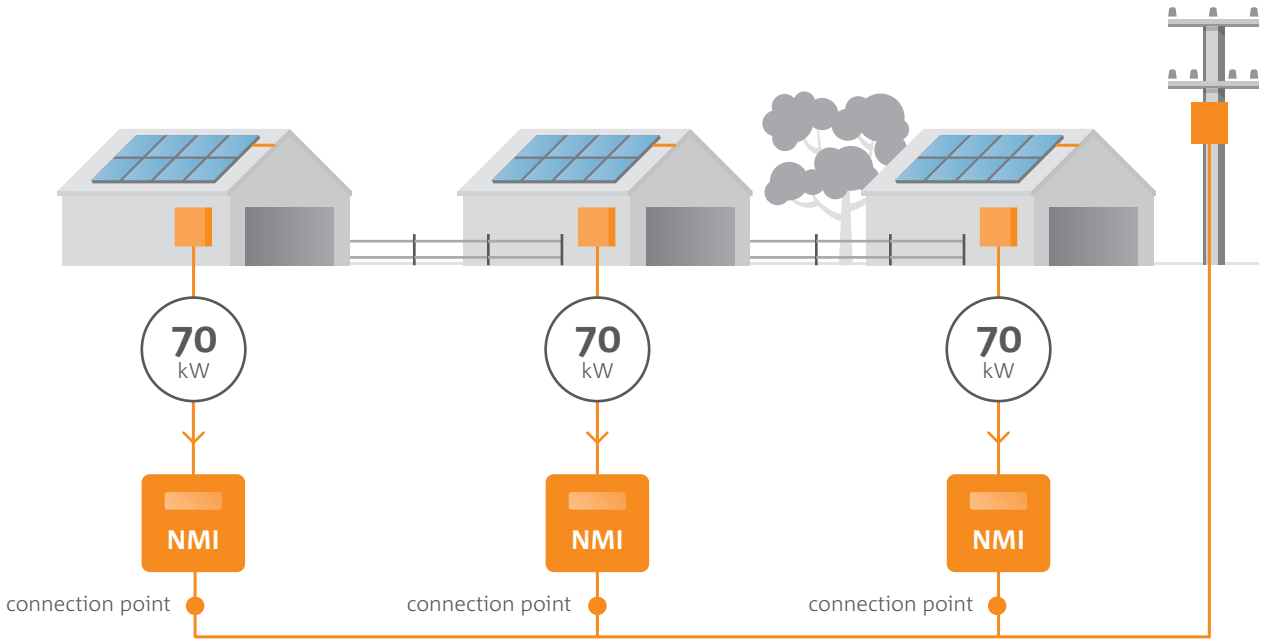
The connection is considered one clustered 240kW system as all inverters are on one single site, and there is one NMI connecting to the grid.

Assessed under	NPU	SCADA
>200kW process	**Required** (>30kVA)	**Required** (>200kW)

Example 4

Single non-residential facility spread over three adjacent properties with three NMIs

also commercial businesses, universities, etc.



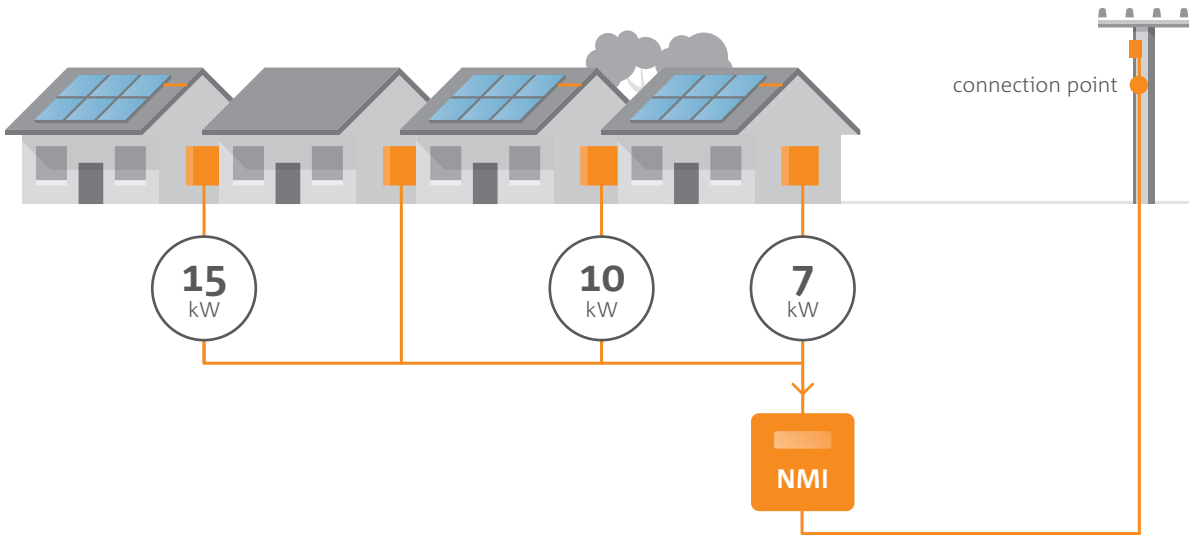
The connection is considered one clustered 210kW system as there is a common owner. There are three NMIs connecting to the grid each exporting <200kW.

Assessed under	NPU	SCADA
2 × assessed under **31–200kW** process Last assessed under **>200kW** process	**3 × NPUs required** (>30kVA)	**Not required** if no network constraint (if constraint, only required for that application)

Example 5

Four residential dwellings connected behind one NMI

regardless of individual tenants having individual meters
also retirement villages, embedded networks, etc.



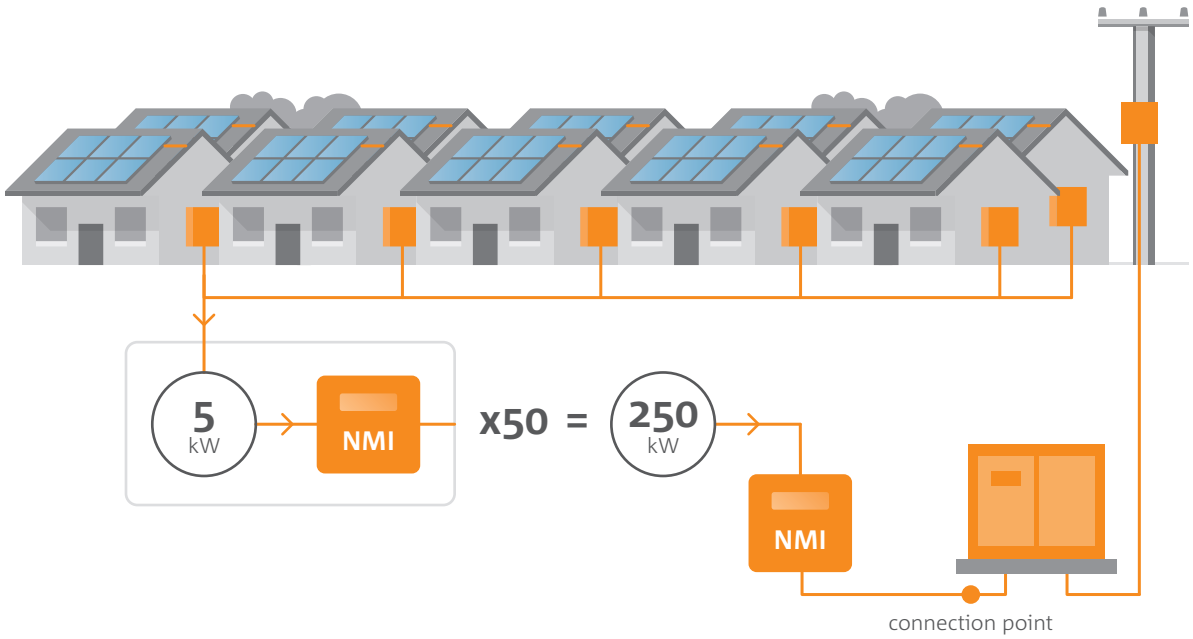
The connection is considered one clustered 32kW system as there is one NMI connecting to the grid.

Assessed under	NPU	SCADA
First assessed under **<30kW** process	**Required** (>30kVA)	**Not required** (if no network constraint)
When >30kW, assessed under **31–200kW** process (and will be exempt from >200kW process)		

Example 6

Fifty residential dwellings with no common interest behind one NMI, each dwelling connected behind individual child NMI

includes community lifestyle villages

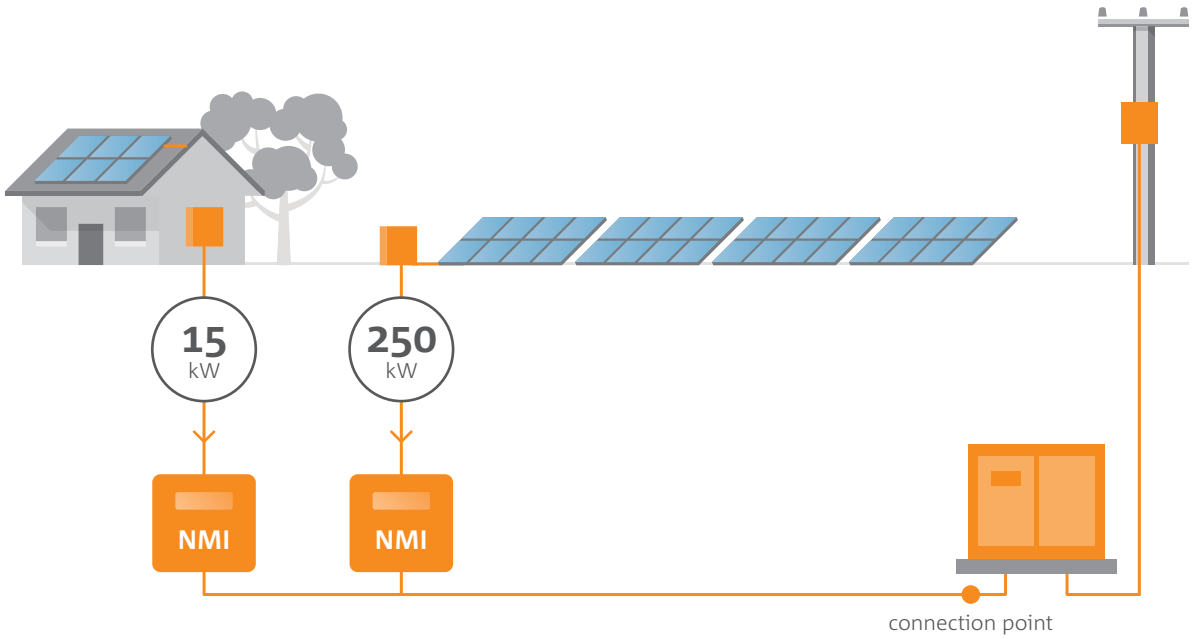


The connection is considered one clustered 250kW system as there is one NMI connecting to the grid.

Assessed under	NPU	SCADA
31–200kW process (exempt from >200kW process)	**1 × NPU required** at connection point *per AS4777.1:2016, Section 3.4.4.1*	**Exempt**

Example 7

Dwelling and solar farm each connected behind individual NMIs on the same land

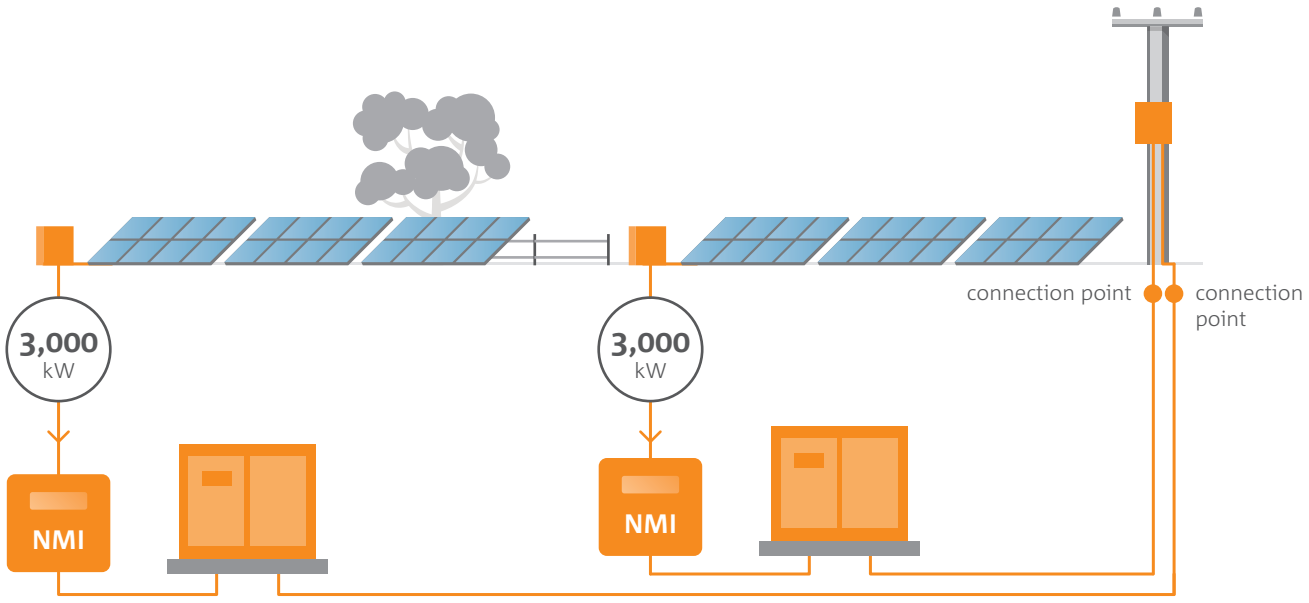


The connection is considered one clustered 265kW system as there is a common land owner.

Assessed under	NPU	SCADA
depends on order of applications – when >200kW, assessed under **>200kW** process	**Up to 2 × NPU required** Or one central NPU, so all generating units are protected by an NPU	**Required for solar farm only**

Example 8

Two solar farms with common interest connected behind individual NMIs on adjacent land



The HV connections are considered one clustered 6MW system as there is a common interest and land is adjacent.

Assessed under	NPU	SCADA
First assessed under **>200kW** process	**2 × NPUs required**	**Required** (>200kW)
Second assessed to the **NER Chapter 5 requirements**		Additional technical requirements listed in TS 131