Register of Completed Embedded Generator Projects

Record Number: R0002503904
Version Number: 2.0
Date: 09 August 2024

TasNetworks | Powering a Bright Future

Contents

TasNetworks acknowledges the palawa (Tasmanian Aboriginal community) as the original owners and custodians of lutruwita (Tasmania). TasNetworks, acknowledges the palawa have maintained their spiritual and cultural connection to the land and water. We pay respect to Elders past and present and all Aboriginal and Torres Strait Islander peoples here with us today.

Document Control

Action	Name and title	Date
Prepared by	E.K. Network Planning	03/08/2023
Reviewed by	A.I. Network Planning Engineer	11/08/2023
Review cycle	Annually	

1. Introduction

This register of completed embedded generation projects connected in Tasmania has been created for the purpose of improving collective technical knowledge of embedded generation projects.

As per clause 5.18B.2 of the National Electricity Rules (NER), TasNetworks must publish a register of completed embedded generation projects in Tasmania. The information in the register must include:

1. technology of generating unit (e.g. synchronous generating unit, induction generator, photovoltaic array, etc) and its make and model;
2. maximum power generation capacity of all embedded generating units comprised in the relevant generating system;
3. contribution to fault levels;
4. the size and rating of the relevant transformer;
5. a single line diagram of the connection arrangement;
6. protection systems and communication systems;
7. voltage control and reactive power capability; and
8. details specific to the location of a facility connected to the network that are relevant to any of the details in subparagraphs (1)-(7).

For further information about embedded generation projects, please contact TasNetworks Network Planning team at networkplanning@tasnetworks.com.au

2. Register of Completed Embedded Generation Projects

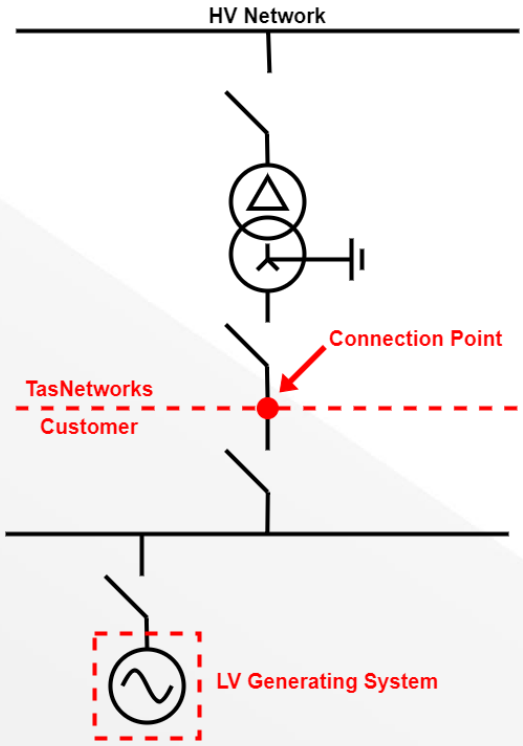
Connection Date	Location	Generating Unit Technology	Make/Model	Maximum Power Generation Capacity (kW)	Contribution to Fault Levels (kA)	Transformer Rating and Voltage (kVA)	Single Line Diagram	Protection Systems and Communication Systems	voltage control and reactive power capability	details specific to the location of a facility connected to the network that are relevant to any of the details in subparagraphs (1)-(7).
1965	Tod's Corner	Hydro Induction Generator with a Francis Turbine	Siemens	1600	Table 1	N/A	Type 3	MV - As per Section 4	MV - As per Section 5	Full Export
1992	Sisters Creek	Wind Turbine	N/A	225	Table 1	315 kVA 22 kV / 249 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2002	Liena	Hydro Generator	1 x Tyco Tamar Francis Turbine	750	Table 1	1000 kVA 11 kV / 433 V	Type 2	LV - As per Section 4	LV - As per Section 5	Full Export
2006	South Hobart	Gas Turbine	General Electric Gas Turbine	1080	Table 1	1000 kVA 11 kV / 415 V	Type 2	LV - As per Section 4	LV - As per Section 5	Full Export
2006	Glenorchy	Gas Turbine	1 x 1065 kW Gas Turbine, 1 x 625 kW Gas Turbine	1690	Table 1	2000 kVA 11 kV/ 415 V	Type 2	LV - As per Section 4	LV - As per Section 5	Full Export
2007	Mowbray	Gas Turbine	Lafayette Power Systems 1100 kW Gas Turbine	1100	Table 1	1250 kVA 22 kV / 415 V	Type 2	LV - As per Section 4	LV - As per Section 5	Full Export
2008	Meander	Hydro Generator	Hydro TECO (Model Number ASCK-TK001) and a Francis Turbine	2100	Table 1	500 kVA 22 kV / 433 V	Type 3	MV - As per Section 4	MV - As per Section 5	Full Export
2010	Launceston	Gas Turbine	Caterpillar G3520C	2000	Table 1	7500 kVA 22 kV / 433 V	Type 2	LV - As per Section 4	LV - As per Section 5	Non Export
2012	Ulverstone	Gas Turbine	Siemens SGT-300	7900	Table 1	N/A	Type 2	LV - As per Section 4	LV - As per Section 5	Non Export
2012	Nietta	Hydro Generator	Mecc Alte Hydro - Tyco Mini Hydro	905	Table 1	1500 kVA 22 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2013	Wesley Vale	Solar Panels / Inverter System + Wind Turbine	1 x Vestas V27-225 Turbine, 136 x 295 W Trina Solar panels, 2 x STP20000TL-30 20 kW inverters	265	Table 1	500 kVA 22 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2014	Kingston	Solar Panels / Inverter System	1154 x JA Solar JAP6-60-240 panels, 18 x Sunny Tripower 170000TL (17kW) inverters	277	Table 1	3000 kVA 11 kV / 433 V	Type 2	LV - As per Section 4	LV - As per Section 5	Non Export
2014	Tyenna	Hydro Generator	3ph 415V 560kw Induction Generator	560	Table 1	500 kVA 22 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2014	Herrick	Hydro Generator	Leroy Somers Synchronous Generator	900	Table 1	1250 kVA 22 kV / 433 V	Type 2	LV - As per Section 4	LV - As per Section 5	Full Export
2015	Derby	Hydro Generator	Hydro ASEA Type "MBR 500L" generator and Turgo Impulse Turbine	1120	Table 1	1150 kVA 22 kV / 3.3 kV	Type 3	MV - As per Section 4	MV - As per Section 5	Full Export
2015	Antill Ponds	Hydro Generator	Hydroworks Generator with a Pelton Turbine	5000	Table 1	N/A	Type 3	MV - As per Section 4	MV - As per Section 5	Partial Export
2016	Woolnorth	Wind Turbine	Vestas V44 A-synchronous Turbine	600	Table 1	500 kVA 22 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2016	Woolnorth	Wind Turbine	N/A	225	Table 1	315 kVA 22 kV / 400 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2018	Latrobe	Solar Panels / Inverter System	560 x 395 W Sunpower panels, 8 x SMA STP25000TL-30 inverters	221	Table 1	1000 kVA 22 kV / 433 V	Type 2	MV - As per Section 4	MV - As per Section 5	Full Export

Connection Date	Location	Generating Unit Technology	Make/Model	Maximum Power Generation Capacity (kW)	Contribution to Fault Levels (kA)	Transformer Rating and Voltage (kVA)	Single Line Diagram	Protection Systems and Communication Systems	voltage control and reactive power capability	details specific to the location of a facility connected to the network that are relevant to any of the details in subparagraphs (1)-(7).
2018	Quoiba	Solar Panels / Inverter System	1786 x Jinko Solar 325 W panels, 18 x Fronius ECO 27.0-3-s inverters, 1 x Fronius ECO 25.0-3-S inverter	511	Table 1	750 kVA 22 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2018	Sassafras	Wind Turbine	N/A	225	Table 1	1000 kVA 22 kV / 415 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2018	Kings Meadows	Solar Panels / Inverter System	Roof A: 465 x Phono Solar 320W, 5 x Solar Edge SE27.6k inverters, Roof B: 1056 x Phono Solar 320 W solar panels, 8 x Solar Edge SE27.6K inverters, 5 x SE15k inverters	433.8	Table 1	500 kVA 22 kV / 243 V	Type 1	LV - As per Section 4	LV - As per Section 5	Partial Export
2019	Moonah	Solar Panels / Inverter System	1080 x JA Solar 380 W panels, 4 x ABB PVS-100-TL inverters	400	Table 1	750 kVA 11 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2019	Bridgewater	Solar Panels / Inverter System	1016 x JA Solar 315 W panels, 3 x ABB PVS-100-TL inverters	300	Table 1	750 kVA 11 kV/ 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2019	Copping	Gas Turbine	Landfill gas reciprocating synchronous generator. Jenbacher J320	2134	Table 1	N/A	Type 2	LV - As per Section 4	LV - As per Section 5	Full Export
2019	Ouse	Hydro Generator	Leroy-Somer LSA 52.2 M60 / 8p Synchronous Generator	900	Table 1	1000 kVA 22 kV / 433 V	Type 2	LV - As per Section 4	LV - As per Section 5	Full Export
2020	Wynyard	Gas Turbine	Caterpillar: G3520	2000	Table 1	2250 kVA 22 kV / 433 V	Type 2	LV - As per Section 4	LV - As per Section 5	Non Export
2020	Hillwood	Solar Panels / Inverter System	918 x Jinko Solar JKM330M-60 330 W panels, 3 x SolarEdge Technologies SE82.8K inverters	248.4	Table 1	200 kVA 22 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Partial Export
2021	Breadalbane	Solar Panels / Inverter System	665 x Jinko Solar 330 W panels, 70 x Trina 450 W panels, 8 x Fronius ECO 27.0-3-S inverters	216	Table 1	1500 kVA 22 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2021	Springfield	Hydro Generator	Synchronous Hydro Generator	1890	Table 1	2100 kVA 22 kV / 3.3 kV	Type 3	MV - As per Section 4	MV - As per Section 5	Full Export
2021	Mersey Forest	Hydro Generator	2 x 1.25 MW asynchronous mini-hydro	2500	Table 1	3000 kVA 22 kV / 6 kV	Type 3	MV - As per Section 4	MV - As per Section 5	Full Export
2022	Glenorchy	Solar Panels / Inverter System	800 x Trina Solar Co Ltd / TSM-500DE18M(II) panels , 3 x Sungrow Power Supply Co Ltd / SG110CX inverters	330	Table 1	1000 kVA 11 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2022	Mornington	Solar Panels / Inverter System	560 x Trina Solar Co Ltd/TSM-500DE18M(II) 2 x Sungrow Power Supply Co SG110CX inverters	220	Table 1	500 kVA 11 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2022	Cambridge	Solar Panels / Inverter System	970 x Trina Solar Co, TSM-450DE17M(II) panels, 3 x Sungrow Power Supply Co, SG110CX inverters	330	Table 1	1000 kVA 11 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Partial Export
2023	George Town	Solar Panels / Inverter System	JA Solar JAM72S30-550/GR 3,030 of	4950	Table 1	5000 kVA 22 kV / 550 V	Type 1	MV - As per Section 4	MV- As per Section 5	Full Export

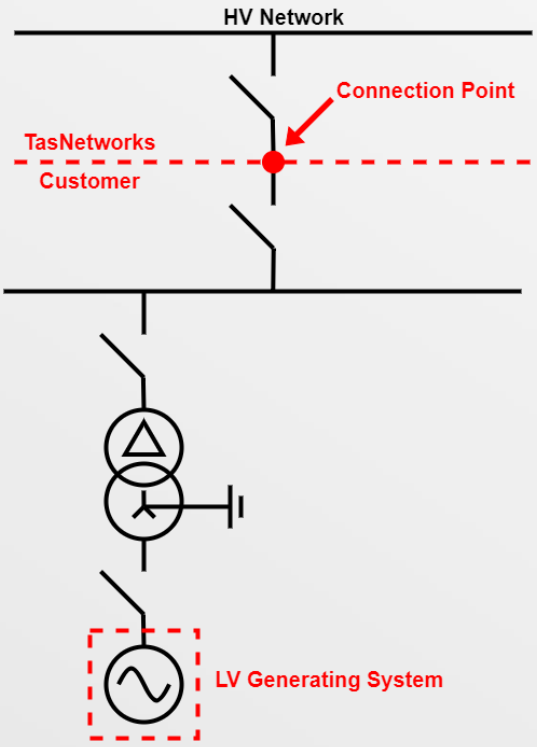
Connection Date	Location	Generating Unit Technology	Make/Model	Maximum Power Generation Capacity (kW)	Contribution to Fault Levels (kA)	Transformer Rating and Voltage (kVA)	Single Line Diagram	Protection Systems and Communication Systems	voltage control and reactive power capability	details specific to the location of a facility connected to the network that are relevant to any of the details in subparagraphs (1)-(7).
			JA Solar JAM72S30-555/GR 12,340 of Inverter – Sungrow SG4950HV-MV Central Inverter							
2023	Trial Harbour	Hydro Generator	Synchronous Hydro Generator	1900	Table 1	2000 kVA 22kV / 690 V	Type 3	MV - As per Section 4	MV- As per Section 5	Full Export
2024	Grove	Solar Panels / Inverter System	Trinia Solar Co Ltd, TSM-500DE18M(II) 500W, 3040 of. SMA Sunny Tripower STP 110-60 (AS4777-2 2020) 12 of, SMA 25000TL, 8 of	1520	Table 1	2000 kVA 11 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Full Export
2024	Wivenhoe	Solar Panels / Inverter System	Chint New Energy Technology Co Ltd 475 watt, 2342 of Sungrow Power Supply Co Ltd SG110CX (AS4777-2 2020), 9 of	990	Table 1	1500 kVA 22 kV / 433 V	Type 1	LV - As per Section 4	LV - As per Section 5	Non Export

3. Single Line Diagram Types

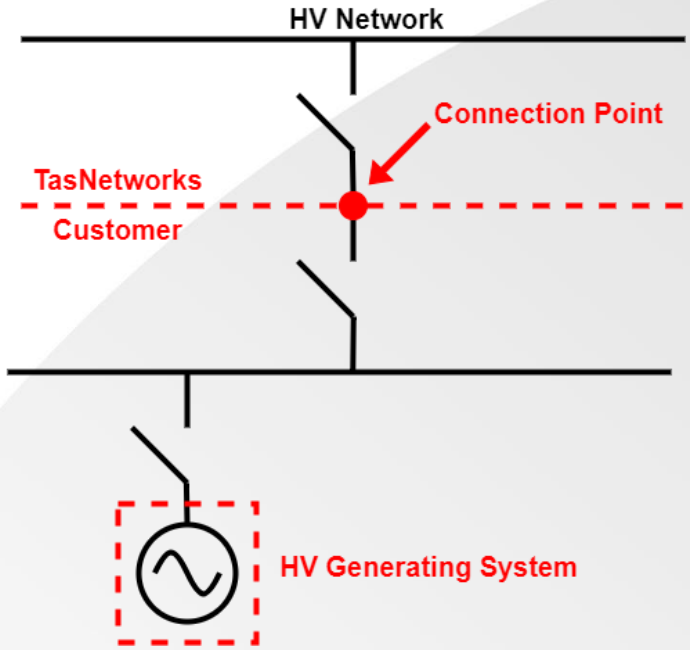
The following single line diagrams depict convention arrangements for embedded generators connecting to TasNetworks' distribution network.



SLD Type 1. Low Voltage Connection with Low Voltage Generating System (Synchronous, Induction or IES)



SLD Type 2. High Voltage Connection with Low Voltage Generating System (Synchronous, Induction or IES)



SLD Type 3. High Voltage Connection with High Voltage Generating System (Synchronous or Induction)

4. Protection Schemes and Communication Requirements

TasNetworks central protection requirements apply for all LV embedded generators. For details on the central protection functions that apply to each subcategory of LV embedded generator system, refer to Section 4.7.2. Central Protection, within TasNetworks technical requirements for low voltage embedded generation customers:

- Low Voltage Embedded Generation Technical Requirements (tasnetworks.com.au)

TasNetworks central protection requirements also apply for all MV embedded generators. For details on the central protection functions that apply to each subcategory of MV embedded generator system, refer to Section 5.2.5 Central Protection, within TasNetworks technical requirements for medium voltage embedded generation customers:

- Medium Voltage Embedded Generation Technical Requirements (tasnetworks.com.au)

Note that for LV and MV embedded generation customers, TasNetworks may require appropriate communication systems be in place for the purposes of monitoring and control. The communication protocol must integrate with TasNetworks existing SCADA system, which is based on DNP 3.0.
For LV customers, refer to section 4.11 Communication Systems of TasNetworks technical requirements for low voltage embedded generation customers. For MV customers, refer to section 5.5.1 Communication Systems of TasNetworks technical requirements for medium voltage embedded generation customers.

5. PQ Voltage and Power Factor Control

For low voltage customers, TasNetworks may require power factor control, depending upon the outcome of technical studies. For further detail, see section 4.7.4. Power Factor Control, within TasNetworks technical requirements for low voltage embedded generation customers:

- Low Voltage Embedded Generation Technical Requirements (tasnetworks.com.au)

For medium voltage, the power factor is required to adhere to an agreed voltage or power factor control arrangement. For further detail, see section 5.1.1. Reactive Power Capability and Power Factor Requirements (S5.2.5.1), within TasNetworks technical requirements for medium voltage embedded generation customers:

- Medium Voltage Embedded Generation Technical Requirements (tasnetworks.com.au)

6. Fault Level Contribution Factor

Indicative fault level contribution from generating systems:

Table 1. Fault Level Contribution Calculation

Generator Type	Fault Level Contribution Factor
Synchronous Generator Unit	7 X Rating
Solar/Inverter Generator Unit	1.2 X Rating