



DESIGN REPORT SUMMARY

Project Name: 1510WH

Iteration: leapfrog

for

Wren

Date: 2025-05-02

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1. Plant summary

1.1 Site Information

The 1510WH plant is located in Åland Islands with a development area size of approximately 72.44 Ha. This report provides the details of the solar PV plant generated by AUTOPV™. The table below indicates the key site parameters for the plant.

Site parameters

PARAMETER	VALUE
Latitude, Longitude	35.798828, 137.167714
Altitude [m]	668
Time Zone	UTC
Minimum Temperature [°C]	-13.33
Average Temperature [°C]	12.1
Maximum Temperature [°C]	32.05
Global Horizontal Irradiance [W/m²]	159.1
Diffuse Irradiance [W/m²]	62.42
Average Wind Speed [m/s]	1.36
Meteorological Data Source	ERA5

1.2 Plant Details

The following tables provide a summary of the key PV plant details.

Key equipment details

PARAMETER	VALUE
PV Module Type	TrinaSolar, TSM-DEG21C.20-655
PV Module Power (at STC) [Wp]	655
PV Module Dimensions [m]	2.384 x 1.303 x 0.035
Inverter Type	Sungrow, SG350HX-24
Inverter Rating (30°C) [kVA]	352
PTS Type	Sungrow, MVS6400-LV-20
PTS Rating [kVA]	6,400
PV Tracker Type	Astra LF Single-Row 1P 2S-28M
PV Tracker Config	28B-28Z>B1.8-Z0

System details

PARAMETER	VALUE
Plant Architecture	String Inverter
System Type	1P

Pitch [m]	5
Road Width (Internal Perimeter) [m]	4 3
Gap Between PV Modules [mm]	20.0
Major Corridor Width [m]	20.0
PV Modules in Series per String	28
Total PV Strings	2,492
Total PV Modules	69,776
Total Trackers	1,246
Total PV Tracker Piles	12,460
Total String Inverters	120
No. of PV Blocks	6
Plant DC Power (25°C) [MWdc]	45.7
Plant AC Power (30°C) [MWac]	42.24
Assumed Power Factor	1
DC/AC Ratio (25°C / 30°C 25°C / 40°C)	1.082

Electrical details

PARAMETER	VALUE
<i>General</i>	
System DC Voltage [Vdc]	1,500
System LVac Voltage [Vac]	800
DC String Cable Type & Size [mm²]	Cu, 6
LVac String Cable Type & Size [mm²]	Al, 300
<i>DC String Cables</i>	
Total Length of Cables [m]	201,129
Max Circuit Length [m]	235.4
Total Power Loss [kWdc]	260.5
Total Power Loss [%]	0.57
Max Voltage Drop [%]	1.66
<i>LVac String Cables</i>	
Total Length of Cables [m]	20,642
Max Circuit Length [m]	491.2
Total Power Loss [kWdc]	436.0
Total Power Loss [%]	1.032
Max Voltage Drop [%]	3.582
<i>Trenching</i>	
Total Length of DC String Trenches [m]	6,120

Total Length of LVac String Trenches [m]	6,118
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*Calculated at the PCU/PTS. Losses between PCU/PTS and POC not included

2. PV Block details

The details of each PV block are provided in the following table(s).

PV Block Details: Blocks 1 - 5

PARAMETER	1	2	3	4	5
<i>General</i>					
No. of PV Strings	400	402	360	438	456
No. of PV Modules	11,200	11,256	10,080	12,264	12,768
No. of Trackers	200	201	180	219	228
No. of Piles	2,000	2,010	1,800	2,190	2,280
No. of String Inverters	20	20	20	20	20
<i>DC String Cables</i>					
No. of Cables	400	402	360	438	456
Total Length of Cables [m]	31,867	34,559	26,705	36,292	36,904
Max Circuit Length [m]	205.1	235.4	138.9	225.3	195.0
Total Power Loss [kWdc]	41.27	44.76	34.59	47.0	47.8
Total Power Loss [%]	0.0903	0.0979	0.0757	0.103	0.105
Max Voltage Drop [%]	1.446	1.66	0.979	1.589	1.375
<i>LVac String Cables</i>					
No. of Cables	20	20	20	20	20
Total Length of Cables [m]	4,844	3,923	2,707	3,234	3,408
Max Circuit Length [m]	491.2	367.3	328.1	346.5	354.9
Total Power Loss [kWdc]	102.3	82.85	57.18	68.31	71.98
Total Power Loss [%]	0.242	0.196	0.135	0.162	0.17
Max Voltage Drop [%]	3.582	2.678	2.392	2.527	2.588
<i>Trenching</i>					
Total Length of DC String Trenches [m]	965.0	1,055	870.0	1,055	1,110
Total Length of LVac String Trenches [m]	1,583	769.7	670.1	777.3	1,053

PV Block Details: Blocks 6

PARAMETER	6
<i>General</i>	
No. of PV Strings	436
No. of PV Modules	12,208
No. of Trackers	218

No. of Piles	2,180
No. of String Inverters	20
DC String Cables	
No. of Cables	436
Total Length of Cables [m]	34,803
Max Circuit Length [m]	195.0
Total Power Loss [kWdc]	45.08
Total Power Loss [%]	0.0986
Max Voltage Drop [%]	1.375
LVac String Cables	
No. of Cables	20
Total Length of Cables [m]	2,526
Max Circuit Length [m]	265.4
Total Power Loss [kWdc]	53.34
Total Power Loss [%]	0.126
Max Voltage Drop [%]	1.936
Trenching	
Total Length of DC String Trenches [m]	1,065
Total Length of LVac String Trenches [m]	1,265

3 AUTOPV™ configuration settings

3.1 Site

PARAMETER	VALUE
AC Cable Variation Correction	1
Architecture	010
Combiner Box Prefix	CB
Conduit Fixed Correction	1
Conduit Variable Correction	1
DC Cable Variation Correction	1
Frequency [Hz]	50
Inverter Prefix	INV
PCU Prefix	PCU
Power Factor	1
PV String Prefix	S
Reference Point	X: 0, Y: 0

3.2 Table

PARAMETER	VALUE
Module Connection Offset Y [m]	1.5
Tracker Config	28B-28Z>B1.8-Z0

3.3 Routing

PARAMETER	VALUE
Cables per Conduit	3
Direct to Junction Box	False
Down Pile Offset	0.5
Junction Box Setback	0.8
Minor Corridors	True
Routing Sequence	['pile', 'ground', 'trench']
Trench Depth [m]	0.5
Trench Ignore Offset Rows	1
Trench Routing	row_ends

3.4 Sorting

PARAMETER	VALUE
In Block	False
In Block Location	row_end



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