WATER POWER SERVICES
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Feasibility Study for Microgeneration at Lough Cumnel Group Water Scheme, Co. Mayo

The Treatment Plant for lough Cumnel Group Water Scheme *(Google Earth)*

This project is part-funded by the European Union, Department of Rural and Community Development and Mayo Local Action Group (LAG) under the Rural Development Programme (LEADER) 2014 – 2020.

Introduction

The purpose of this report is to investigate the viability of harnessing the potential renewable energy available at Lough Cumnel Water Works. Three forms of renewable energy are considered for microgeneration:

- Hydro Power – The water flowing from the lake to the plant has a power potential and this is investigated.
- Wind Power – The plant is situated in a location suitable for wind energy and this potential is assessed.
- Solar Power – The potential for solar PV is quantified taking into account the available footprint of the plant.

This report also deals with identification of suitable equipment, proposals for integration of any generated electricity with the existing ESB Networks supply, and proposals for optimising the use of the electricity generated with plant requirements. The lifespan of proposed technology and the amount and nature of any equipment are also covered.

Summary

The site was visited on 24 August 2022. The plant was examined and the operation explained with the help of the members of the group scheme and a representative of Glan Aqua, who run the plant. The group also provided illustrations and data of the operation and energy use of the plant.

With this information in hand, Water Power Services held meetings with experts in solar and wind power to ensure that the information included in this report is up-to-date and relevant.

The following pages contain a detailed explanation of the conclusions summarised here:

- Solar power was found to be the best option as solar can provide over 50% of the energy needs of the plant in the immediate future with existing available technology.
- Wind power is the next best option. While the plant is located at an excellent wind site, the availability of suitable equipment is a difficulty. There is one suitable machine available and it should be considered complementary to solar to create a hybrid system.
- Hydro power is the least viable option. While in theory a hydro scheme would seem to be compatible with the running of the plant, the scale of water use for domestic supply is nowhere near the scale required for power generation.

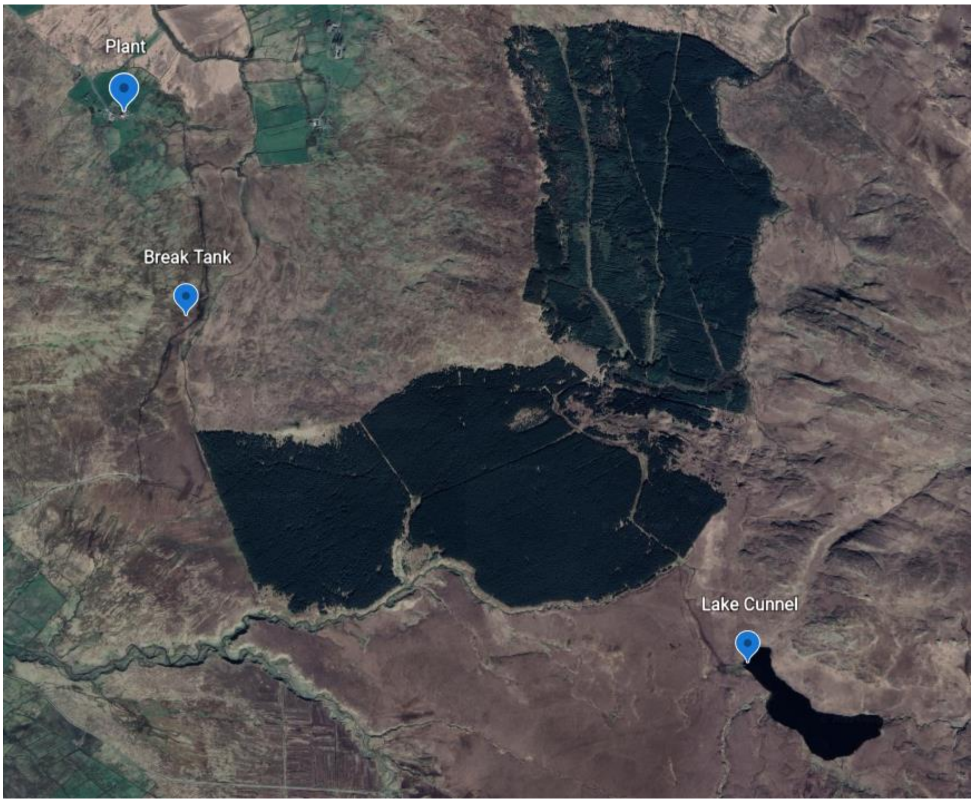
Plant Description

The purpose of the treatment plant is to provide clean water to the houses and farms in the Killeen area. The scheme supplies over 370 houses.

Water is extracted from a mountain lake, Lake Cumnel, at an elevation of approximately 215 m above sea level and delivered by gravity pipeline to the treatment plant located over 3 km away at an elevation of approximately 105 m. As the pipe is not straight, the full length is 4.9 km. Flow rate can be adjusted between 15 m^3/hr (cubic metres per hour) and 30 m^3/hr. A break pressure tank is located at a distance of approximately 900 m before the treatment plant. This tank is at an elevation of approximately 125 m.

Under normal circumstances the plant can take in up to 22.8 m^3/hr. While this varies and there is a flushing sequence once a day, the plant has a more consistent use of electrical power than most facilities. The output from the plant is 11.2 m^3/hr. This means that while the plant can take in up to 22.8 m^3/hr, its average input cannot exceed 11.2 m^3/hr.

For the purposes of this report the electricity usage is taken as remaining at a consistent level throughout the day and year of 97,450 kWh (kilowatt hours) divided by 8,760 hours per year, which is equal to 11 kW per hour.



Location of intake at Lake Cumnel at 215 m, the Break Tank at 125 m and the Plant at 105 m *(Google Earth)*

Power Usage and Connection

Figures supplied by Lough Cumnel Group Water Scheme show the annual electricity usage over a 15-month period from March 2021 to May 2022. These figures are:

Total Annual usage	= 97,450 kWh (kilowatt hours)
Average Monthly usage	= 7,840 kWh
Minimum Monthly Usage	= 5,950 kWh
Maximum Monthly Usage	= 9,950 kWh

The purchase price of this power at current prices (October 2022) is c. €0.34 per kWh, which is equal to €33,133 per annum. While the cost of this electricity is variable, it is unlikely to fall in the future.

Adding a renewable energy scheme to the plant could be regarded as a ‘load lightener’. Any such scheme should be connected to the national grid, and connection means that using the power would be fully automatic. It is not difficult to obtain permission to make such a connection. However, there will be a limit to the size of any proposed plant as, while there is three-phase power on site, it is a remote location and the grid may only be able to accommodate a certain amount of power.

A scheme that supplies part of the plant’s demand and is fully integrated into the national grid will work as an optimising supply for the plant.

If a scheme were envisaged that would supply a majority of the power requirement of the plant, a battery bank or similar could be considered. However, the proposals in this report do not discuss such a scale of power provision as the site is limited in size to house such generation.

The Microgeneration Options

Hydro Power Potential

Assuming that the water treatment plant takes an average of 11.2 m^3/hr (cubic metres per hour), the flow for power generation purposes is 11.2 m^3/hr or 0.19 m^3/min or 0.003 m^3/sec. (This is 3 litres per second.) The head, or difference in elevation, of water available is in two stages.

Stage 1: From the lake to the break tank

This is a pipe length of some 3.8 km. The pipe is 150 mm internal diameter. The gross head available is 87 m, but this would be reduced to 86 m due to friction losses in the pipe. The following calculation is therefore based on a head of 86 m.

Given a flow of 0.003 m^3/sec and a head of 86 m the power available can be ascertained as

P = 9.81 QHn where P = maximum power in kW
Q = Flow in m^3/sec
H = Head (m)
n = efficiency
9.81 x 0.003 x 86 x 0.7 = 1.8 kW

This power, at €0.34 per kWh, would cost €5,300 per annum to buy at current prices.

There are further considerations to be made in relation to this proposal

- The pipeline has undergone work in recent times and is inclined to give trouble in relation to air locking.
- Locating the turbine nearly 1 km from the plant would mean 1 km of a power line to the break tank and difficulty in servicing and daily maintenance of the scheme.

Stage 2: From the break tank to the plant (see illustration on next page)

This is a pipe length of some 1.1 km. The pipe is 100 mm in diameter. The gross head available is 20 m, but this would be reduced by 1.7 m due to friction losses in the pipe. The following calculation is therefore based on a head of 18 m.

Given a flow of 0.003 m^3/s and a head of 18 m the power available can be ascertained as
P = 9.81 QHn where P = maximum power in kW
Q = Flow in m^3/s
H = Head (m)
n = efficiency
9.81 x 0.003 x 18 x 0.7 = 0.37 kW

This power, at €0.34 per kWh, would cost €1,100 per annum to buy at current prices.

(Hydro Power Potential cont'd)

Stage 2 (illustration)

Schematic of Pipeline from the Break Tank at 125 m to the Treatment Plant at 105 m *(Google Earth)*

To summarise:

The Stage 1 location is very remote from the plant and would require monitoring and a diversion system so that if there was a problem it did not interfere with the normal running of the plant. This combined with the small contribution in power terms make this scheme not viable.

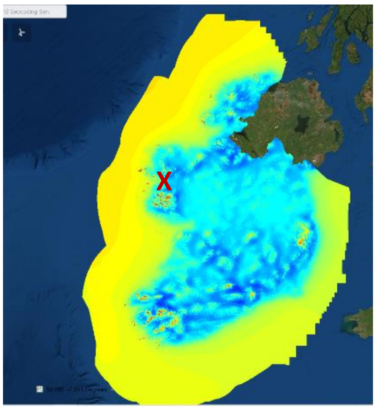
While the Stage 2 pipe might be a more feasible project, the small output from the turbine would not contribute in a meaningful way to the running of the plant.

Wind Power Potential

The site location means that it has good wind power potential. From the SEAI Wind Map (see below) it can be ascertained that the average wind speed is 6 metres per second (m/s)

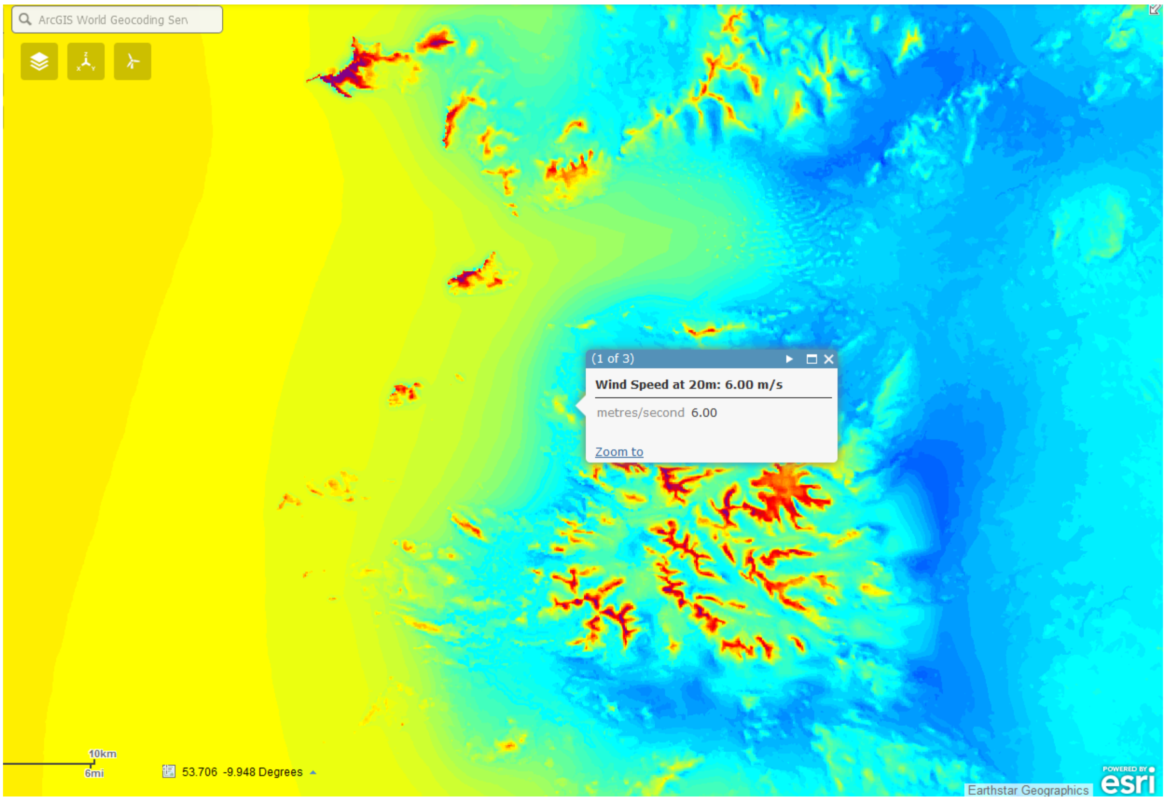
At an annual load of 100,000 kWh, a mean wind speed of 6 m/s on site, and a typical load factor of 30% (the amount of power produced over time), a turbine that would run the plant all of the time would need to be a 30 to 40 kW machine.

This could be an ideal solution if there were a system of net metering available in Ireland. In a net metering system, the utility (ESB) would measure your import and export and settle the bill based on the difference at the end of an agreed time, typically a month or a year. Such an arrangement is quite common throughout the world, but is not available in Ireland at present.



Map (left) showing wind speeds in Ireland. Wind speed at the site of the treatment plant (marked **X**) averages 6 m/s.

Source: Sustainable Energy Authority of Ireland



Wind speed at the location of the treatment plant *(SEAI)*

(Wind Power Potential cont'd)

Wind energy has developed enormously over the past few decades. The machines available today are powerful and reliable. The great change is that the machines have become much bigger, and the smaller machines have largely been abandoned as solar power has filled the role of smaller generation worldwide.

The site at the water works is restricted in size. This will limit the footprint of any solar scheme, which means that a wind machine should be considered as part of a hybrid system.

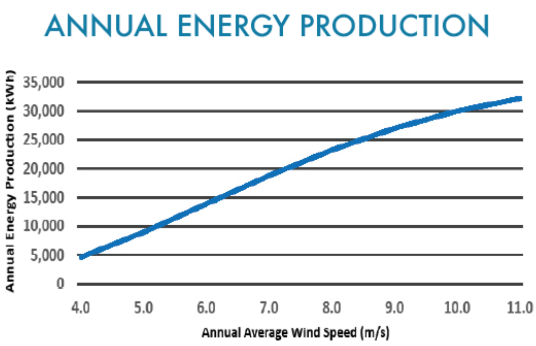
There are several advantages to combining different renewable generators in a hybrid configuration. The main advantage is that there is usually a high level of complementarity between available wind and solar energy. While the day cycle complementarity is relatively low, most locations show a significant complementarity in annual cycles. It means that when wind is weak, the sun shines brighter and vice versa, which leads to more stable and reliable energy generation.

There is only one machine available on the market today that would suit this site, and that also has a track record sufficient that it can be recommended. It is the SD6 Wind Turbine (see Appendix III).

The cost of such a machine is in the region of €50,000 installed. Planning permission would be required for wind machines.

This 6 kW machine will produce c. 15,000 kWh per annum at a mean wind speed of 6 m/s. This power, at €0.34 per kWh, would cost €5,100 per annum to buy. This would cover 15% of the power needs of the plant. There is room for two units on the site, which would cover a total of 30% of the plant's power needs. The lifespan of this model of machine would be 20 years and it would have a payback time of over 10 years.

The SD 6 Wind Turbine



(SD Wind)

Solar Power Potential

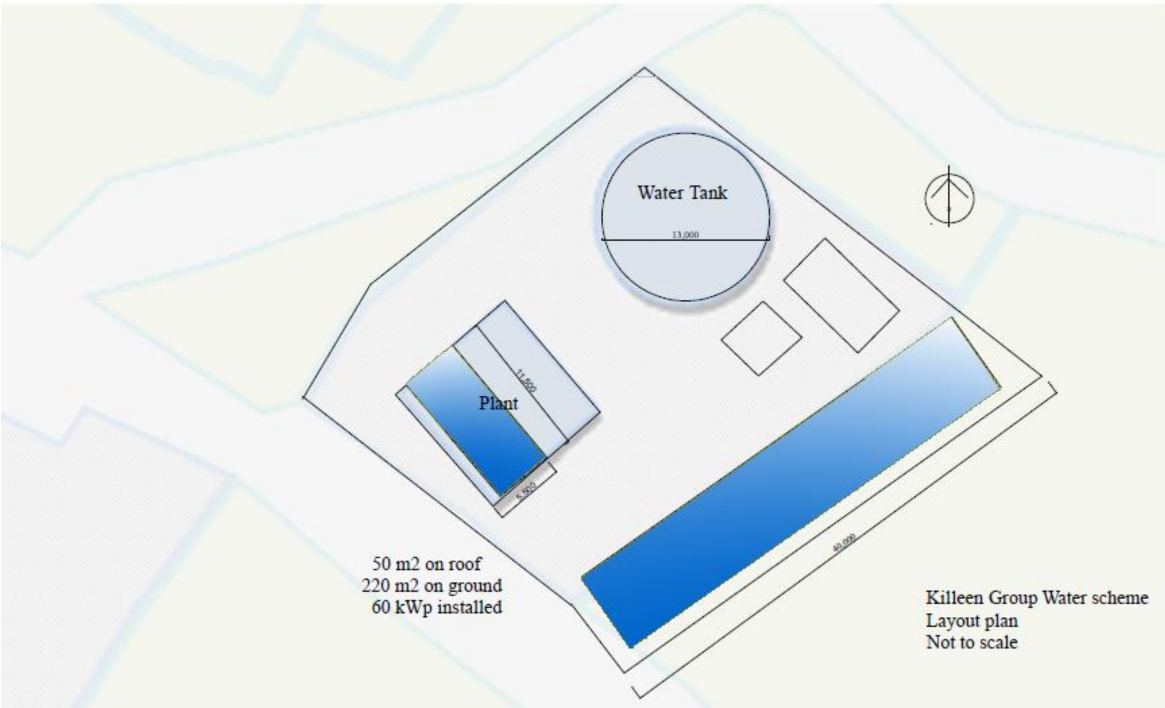
For the scale of power needed at this plant, solar power is the most flexible and available option. In theory, a solar plant can be built to any size depending on the amount of space available. With the use of battery storage or a system of net metering it would theoretically be possible, if the space were unlimited, to supply all of the needs of the Lough Cumnel plant at Killeen. However, given the space available and the current lack of a net metering system, solar is most suited to supplying a portion of the power needed for the plant.

By using the strip of ground on the south-eastern side of the site and the roof of the treatment plant it would be possible to install a total of 270 m^2 (square metres) of photo-voltaic (PV) solar panels (see schematic below). There is a storage locker at the north east corner of the site that would have to be moved, but this is not difficult. The ground panels would number 96 and cover 222 m^2, the roof panels would number 20 and cover 48 m^2.

This 270 m^2 installation would give a total output of 49,230 kWh or about 50% of the total power needed by the plant. To buy this power at €0.34 per kWh would cost €16,738 per annum.

The cost of installing 270 m^2 of solar PV panels would be in the region of €90,000, €75,000 for the ground panels and €15,000 for the roof panels. See Appendix I and II for a breakdown of the cost and payback of the roof panels. The payback time is estimated at about seven years.

There is a further opportunity to fit panels on top of the existing water tank. While this would be more complicated, in that a special rack would have to be built, it would be worth considering in the future when there is a better arrangement for feeding into the grid with a net metering scheme.



Schematic showing possible solar layout proposed

(Solar Power Potential cont'd)

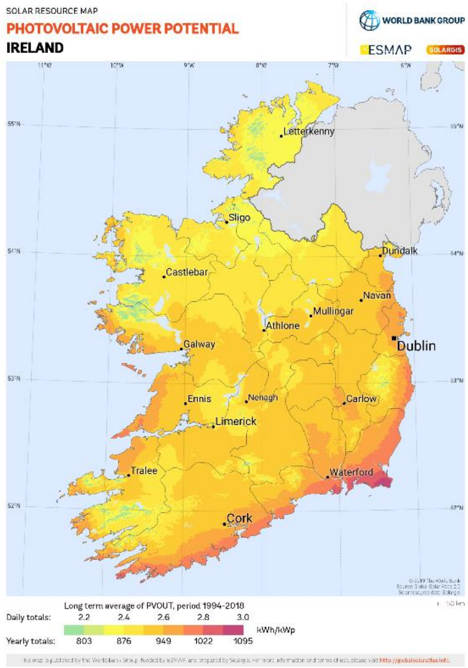
While the orientation of the panels on the roof or ground would not be perfect, the table below shows that the array on the ground, at a tilt of 30 degrees and an orientation of 125 degrees, can achieve an output of over 90% of the possible. On the roof panel, at a shallower tilt of 25 degrees and an orientation of 220 degrees, the output is still over 90%. Further extension panels on the tank would have 100% output as they would have ideal orientation.

	Orientation from North						
	W			S			E
Tilt	270°	240°	210°	180°	150°	120°	90°
0°	84	84	84	84	84	84	84
10°	84	87	90	91	90	87	84
20°	82	89	94	96	94	89	82
30°	81	90	97	100	97	90	81
40°	78	89	97	100	97	89	78
50°	74	87	95	98	95	87	74
60°	69	82	92	95	92	82	69
70°	64	77	86	89	86	77	64
80°	57	69	78	81	78	69	57
90°	50	61	68	71	68	61	50

Percentage output of solar panels at various orientation

The attached Appendices I and II allow for the necessary compromise due to orientation of the solar panels on site.

Solar panels deteriorate over time, but this is a very small degradation. The financial analysis included in Appendix I is based on a lifespan of 20 years.



(World Bank Group)

Map showing the solar potential of Ireland. At the treatment site the power available is c. 876 kWh per square metre.

Conclusions

Immediate Plan

It is clear that at present solar PV is the best option to make the water treatment plant more energy efficient. There are a number of financial models that may suit a solar installation. For example, SEAI have supported the PV array in Polecat, Co. Roscommon (see Appendix IV); LEADER are also a possible source for funds. Having sourced possible funding, the next stage of the process is to put the work out to tender to the significant number of companies in the market.

Longer-term Plan

In time, net metering will become available in Ireland. When this happens, the picture will change considerably, as it will be possible to install a much larger plant, either just PV or a hybrid system with wind. It may also be possible for the Lough Cumnel scheme to acquire an area of land near to the treatment plant in order to erect more PV panels. An area of about 500 square metres would allow for a PV array that would cover 100% of the energy needs of the plant.

The possibility of one large wind turbine jointly owned by a number of Mayo treatment plants should also be considered.

Below, in Appendix V, there is an input from Energy Co-operatives Ireland who are in a position to develop this type of installation further and with a bigger framework.

Appendices

Appendix I
BioXL Design for Roof Solar

Appendix II
HelioScope Design for Ground Solar Panels

Appendix III
SD Wind Brochure

Appendix IV
Polecat, Co. Roscommon, solar PV scheme

Appendix V
Energy Co-ops Ireland

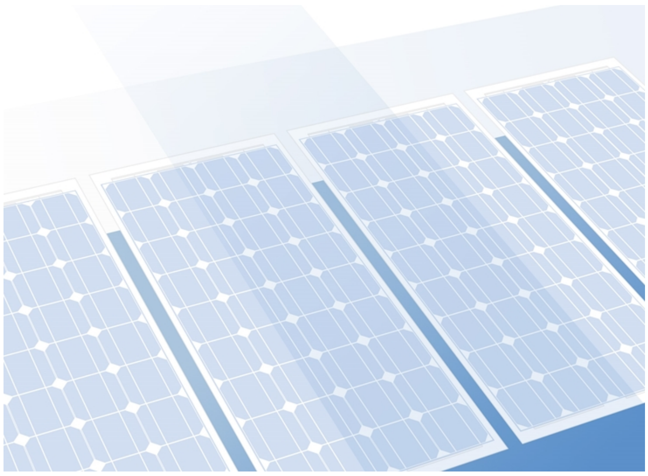
Bioxl Ltd
Broombridge Business Centre
288 Bannow Road
Dublin 7

Contact person:
Tom Bruton
E-Mail: tom.bruton@bioxl.ie

29/09/2022

Your PV system from Bioxl Ltd

Address of Installation



Project Overview

PV System

Grid-connected PV System with Electrical Appliances

Climate Data	Belmullet, IRL (1996 - 2015)
Values source	Meteonorm 8.1
PV Generator Output	10 kWp
PV Generator Surface	48.2 m²
Number of PV Modules	20
Number of Inverters	1

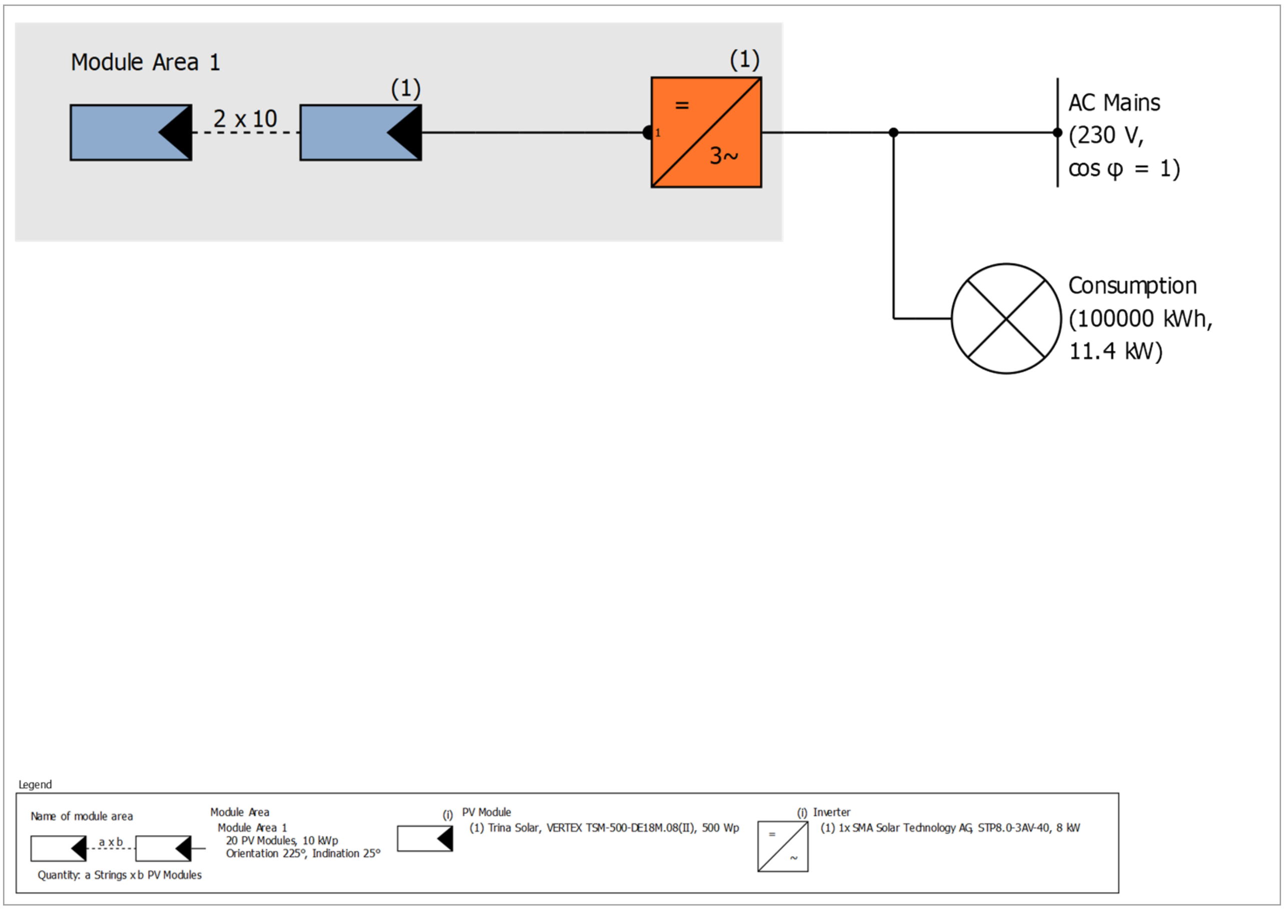


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	10.00 kWp
Spec. Annual Yield	963.61 kWh/kWp
Performance Ratio (PR)	90.83 %
PV Generator Energy (AC grid)	9,653 kWh/Year
Own Consumption	9,653 kWh/Year
Down-regulation at Feed-in Point	0 kWh/Year
Grid Feed-in	0 kWh/Year
Own Power Consumption	100.0 %
CO_2 Emissions avoided	4,529 kg / year
Level of Self-sufficiency	9.7 %

Financial Analysis

Your Gain

Total investment costs	15,000.00 €
Internal Rate of Return (IRR)	13.80 %
Amortization Period	7.2 Years
Electricity Production Costs	0.0826 €/kWh
Energy Balance/Feed-in Concept	Surplus Feed-in

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	Grid-connected PV System with Electrical Appliances

Climate Data

Location	Belmullet, IRL (1996 - 2015)
Values source	Meteonorm 8.1
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Consumption

Total Consumption	100000 kWh
Load with constant energy consumption over the whole year	100000 kWh
Load Peak	11.4 kW

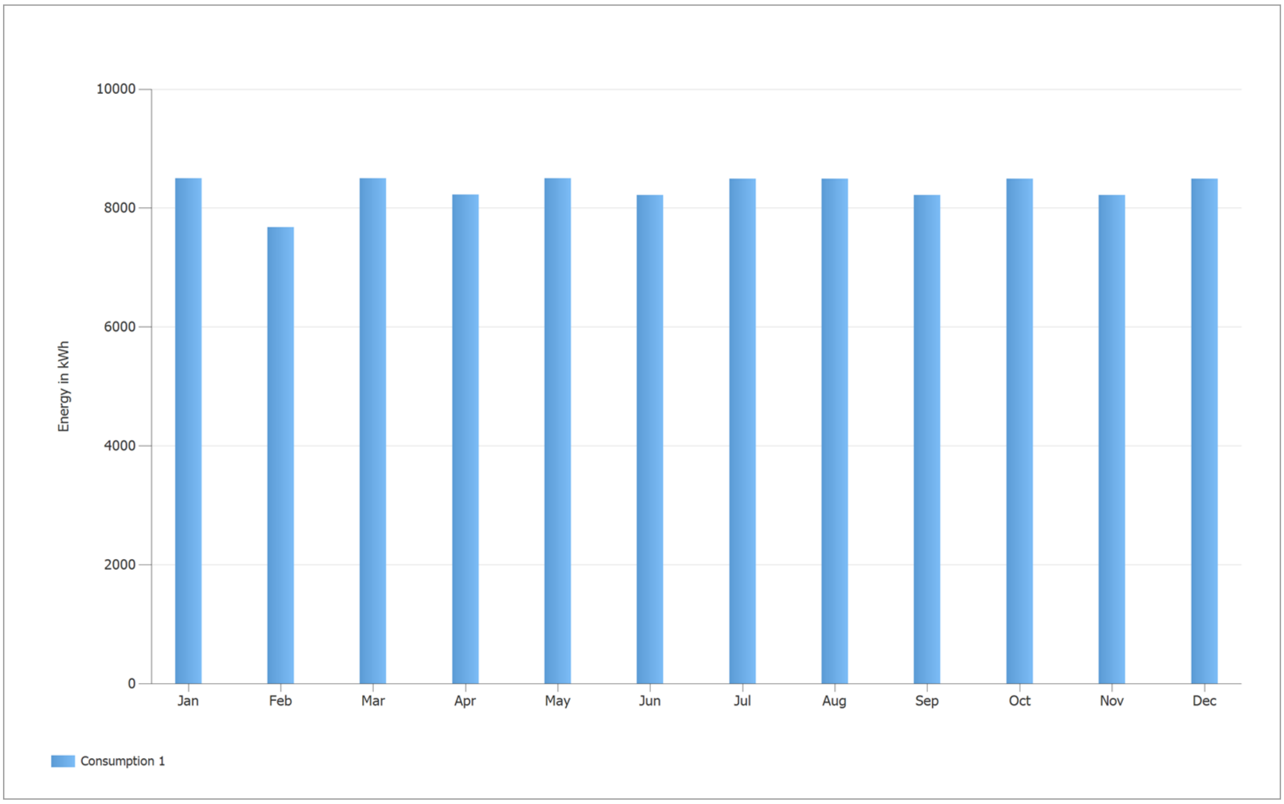


Figure: Consumption

Module Areas

1. Module Area - Module Area 1

PV Generator, 1. Module Area - Module Area 1

Name	Module Area 1	
PV Modules	20 x VERTEX TSM-500-DE18M.08(II) (v1)	
Manufacturer	Trina Solar	
Inclination	25	°
Orientation	Southwest 225	°
Installation Type	Roof parallel	
PV Generator Surface	48.2	m²

Inverter configuration

Configuration 1

Module Area	Module Area 1
Inverter 1	
Model	STP8.0-3AV-40 (v1)
Manufacturer	SMA Solar Technology AG
Quantity	1
Sizing Factor	125 %
Configuration	MPP 1+2: 2 x 10

AC Mains

AC Mains

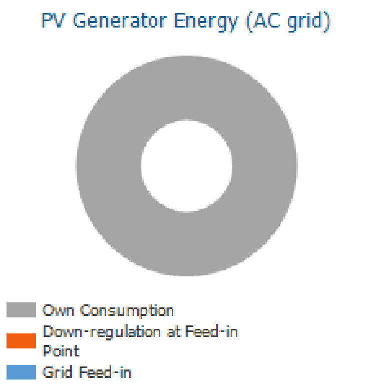
Number of Phases	3	
Mains voltage between phase and neutral	230	V
Displacement Power Factor (cos phi)	+/- 1	

Simulation Results

Results Total System

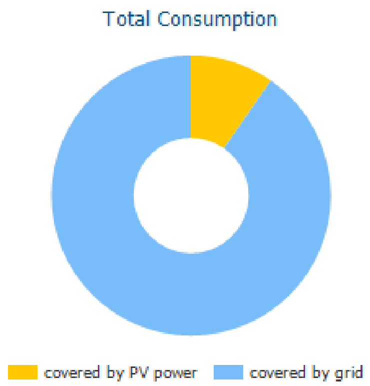
PV System

PV Generator Output	10.00	kWp
Spec. Annual Yield	963.61	kWh/kWp
Performance Ratio (PR)	90.83	%
PV Generator Energy (AC grid)	9,653	kWh/Year
Own Consumption	9,653	kWh/Year
Down-regulation at Feed-in Point	0	kWh/Year
Grid Feed-in	0	kWh/Year
Own Power Consumption	100.0	%
CO_2 Emissions avoided	4,529	kg / year



Appliances

Appliances	100,000	kWh/Year
Standby Consumption (Inverter)	17	kWh/Year
Total Consumption	100,017	kWh/Year
covered by PV power	9,653	kWh/Year
covered by grid	90,364	kWh/Year
Solar Fraction	9.7	%



Level of Self-sufficiency

Total Consumption	100,017	kWh/Year
covered by grid	90,364	kWh/Year
Level of Self-sufficiency	9.7	%

Energy Flow Graph

Project:

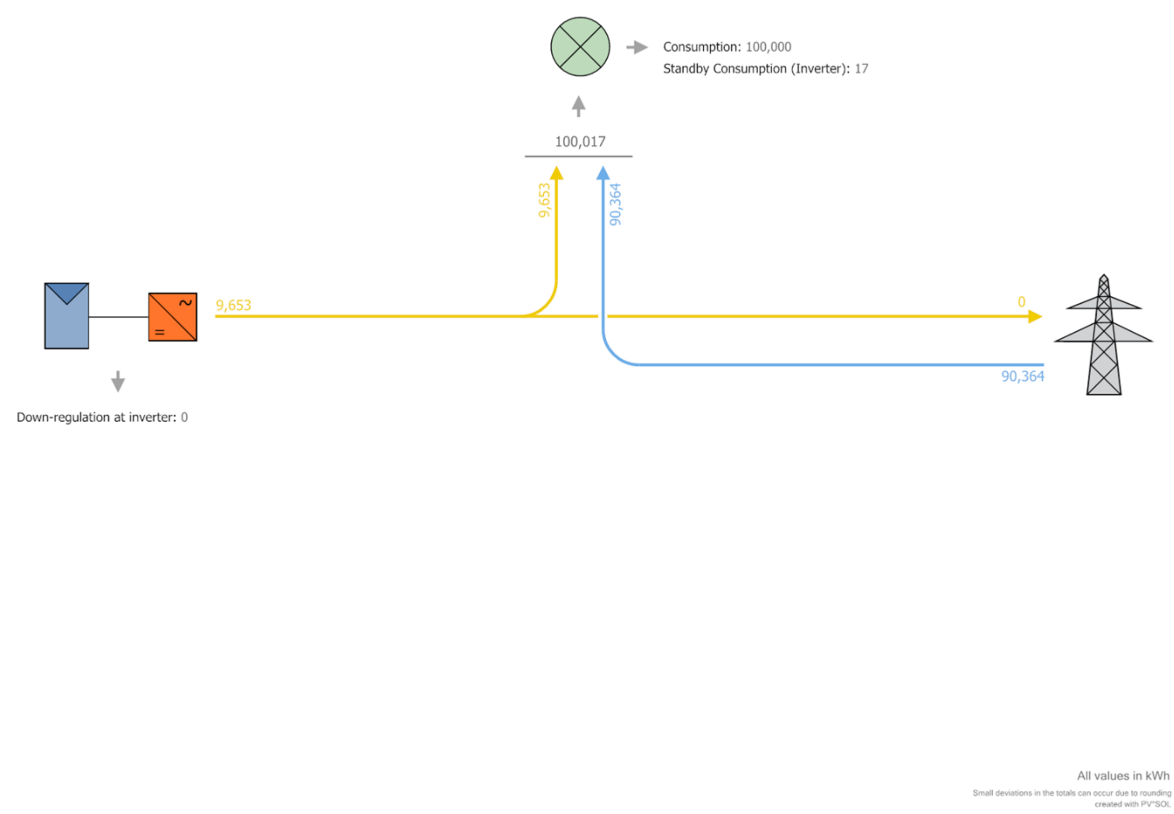


Figure: Energy flow

Appendix II

Design 1 Killeen, Killeen, mayo

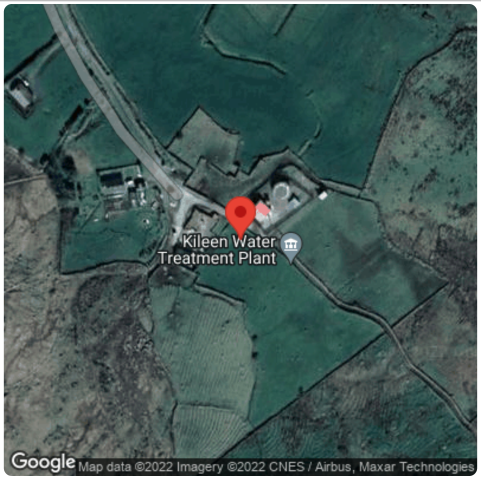
Report

Project Name	Killeen
Project Address	Killeen, mayo
Prepared By	Tom Bruton Chartered Engineer tom.bruton@bioxl.ie

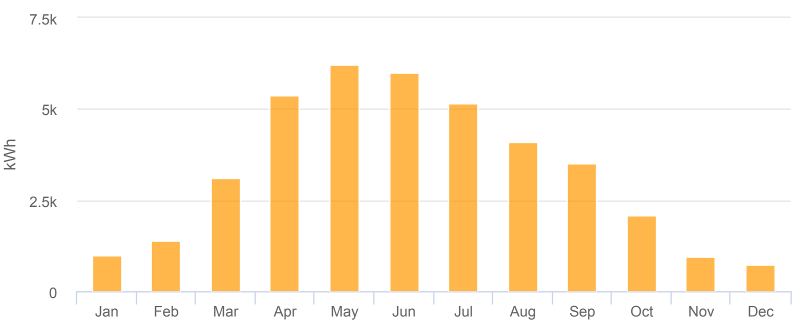
System Metrics

Design	Design 1
Module DC Nameplate	48.0 kW
Inverter AC Nameplate	48.1 kW Load Ratio: 1.00
Annual Production	39.58 MWh
Performance Ratio	87.5%
kWh/kWp	824.5
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
Simulator Version	f57c42ab6e-379fc51964-2504af6b08-813978d04d

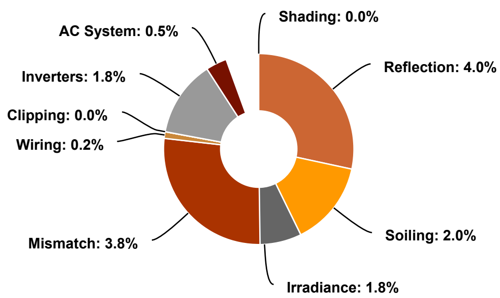
Project Location



Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	857.9	
	POA Irradiance	941.9	9.8%
	Shaded Irradiance	941.9	0.0%
	Irradiance after Reflection	904.6	-4.0%
	Irradiance after Soiling	886.5	-2.0%
	Total Collector Irradiance	**886.5**	**0.0%**
Energy (kWh)	Nameplate	42,580.7	
	Output at Irradiance Levels	41,832.5	-1.8%
	Output at Cell Temperature Derate	42,156.7	0.8%
	Output After Mismatch	40,568.6	-3.8%
	Optimal DC Output	40,505.7	-0.2%
	Constrained DC Output	40,505.6	0.0%
	Inverter Output	39,775.4	-1.8%
	Energy to Grid	**39,576.5**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		11.3 °C
	Avg. Operating Cell Temp		15.8 °C
Simulation Metrics			
	Operating Hours		4564
	Solved Hours		4564

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.075	3°C
Flush Mount	-2.81	-0.0455	0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Module Characterizations

Module	Uploaded By	Characterization
TSM-500DE18M(II) (Trina Solar)	HelioScope	Spec Sheet Characterization, PAN

Component Characterizations

Device	Uploaded By	Characterization
Sunny Tripower 24000TL-US (SMA)	HelioScope	Modified CEC

Components

Component	Name	Count
Inverters	Sunny Tripower 24000TL-US (SMA)	2 (48.1 kW)
Strings	10 AWG (Copper)	6 (46.8 m)
Module	Trina Solar, TSM-500DE18M(II) (500W)	96 (48.0 kW)

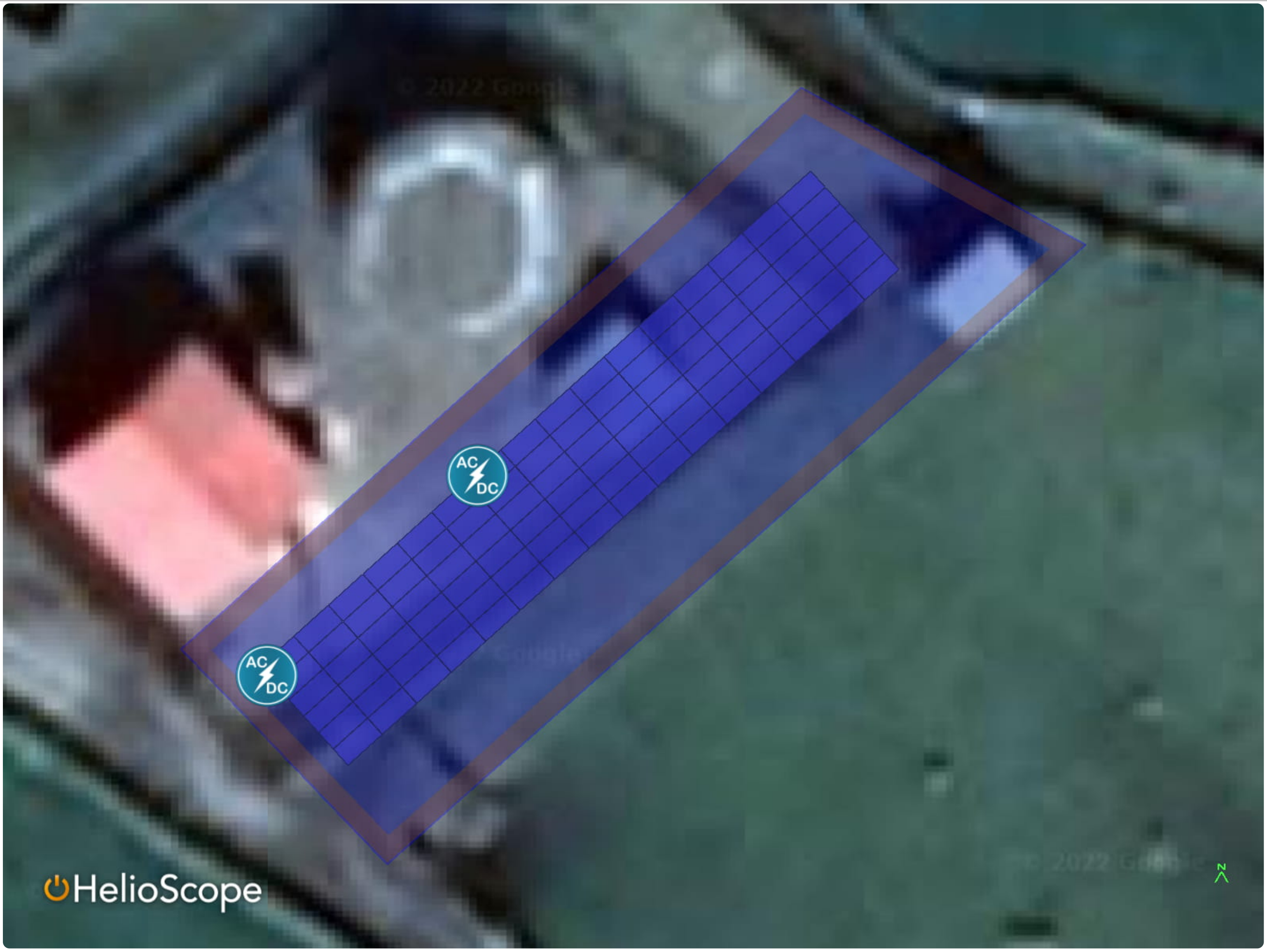
Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	4-17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	20°	138°	2.5 m	6x8	2	96	48.0 kW

Detailed Layout



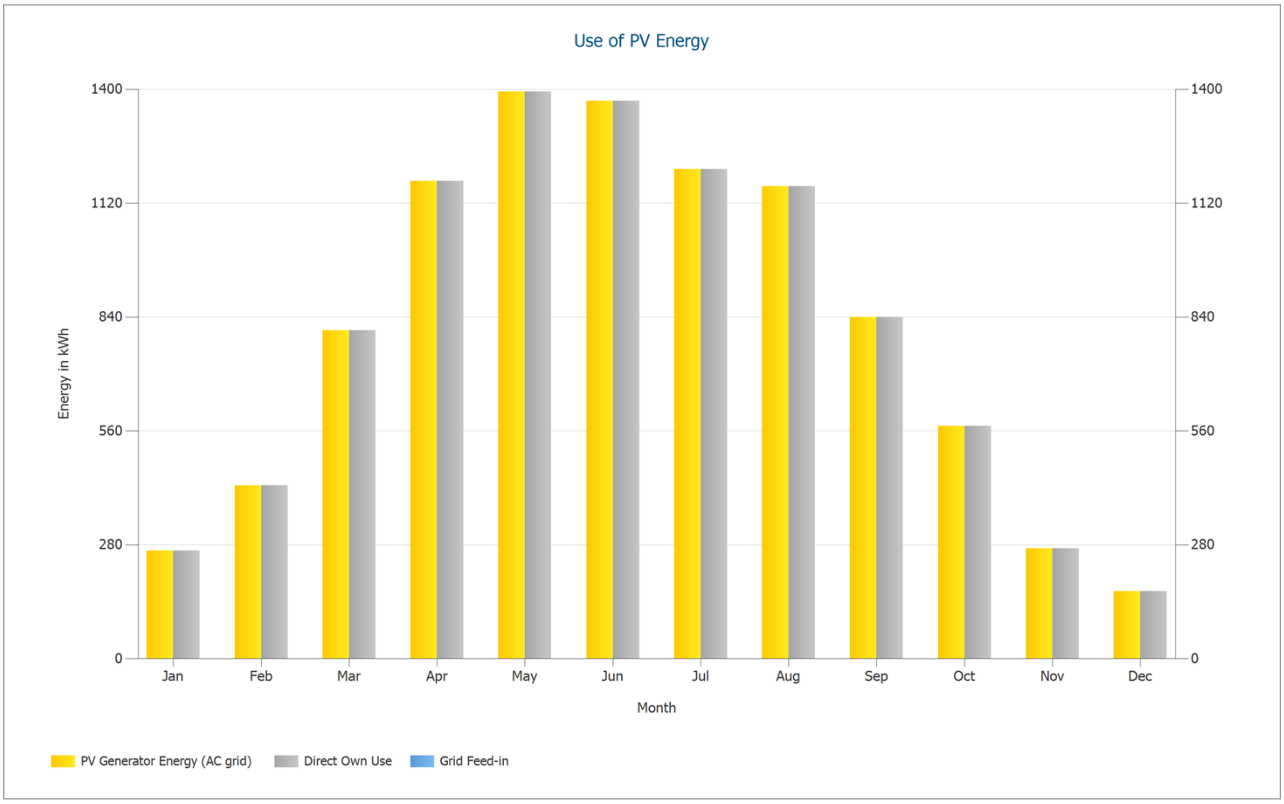


Figure: Use of PV Energy

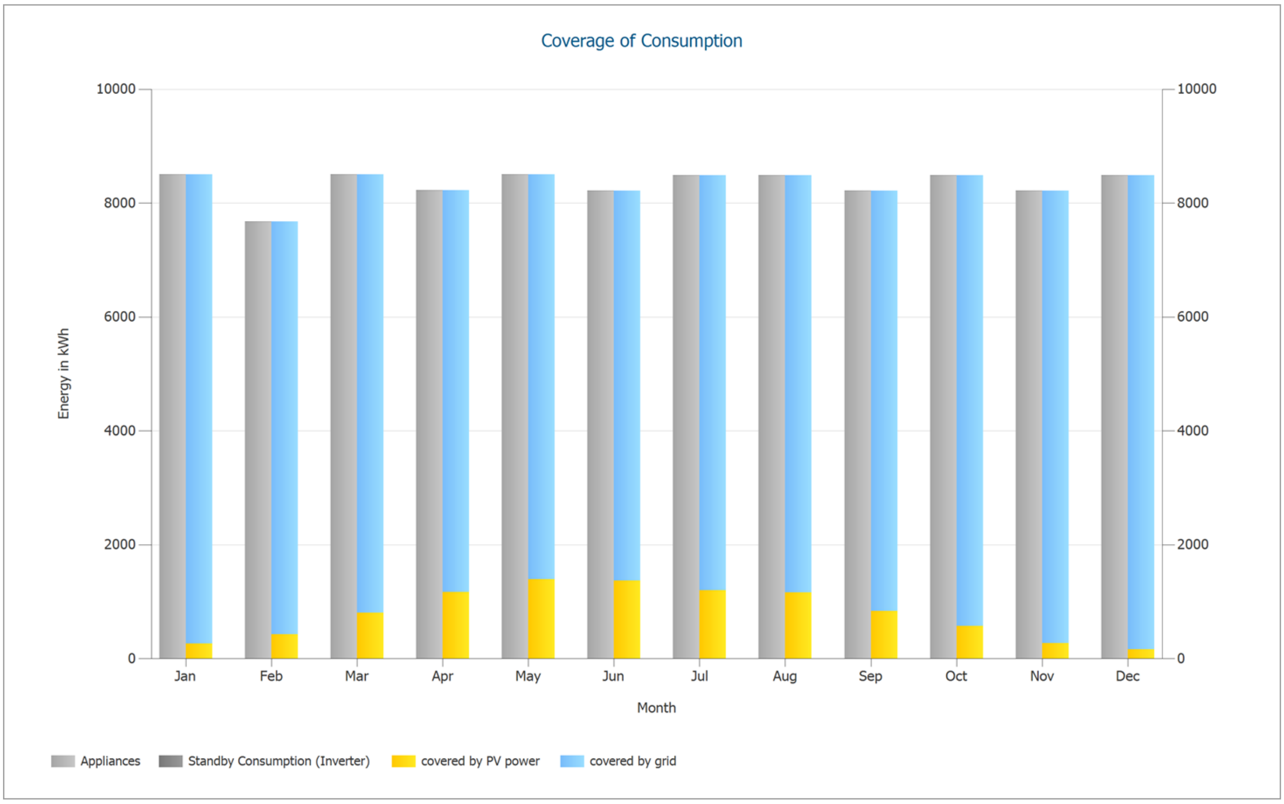


Figure: Coverage of Consumption

Financial Analysis

Overview

System Data

Grid Feed-in in the first year (incl. module degradation)	0	kWh/Year
PV Generator Output	10	kWp
Start of Operation of the System	29/09/2022	
Assessment Period	20	Years
Interest on Capital	1	%

Economic Parameters

Internal Rate of Return (IRR)	13.80	%
Accrued Cash Flow (Cash Balance)	29,197.03	€
Amortization Period	7.2	Years
Electricity Production Costs	0.0826	€/kWh

Payment Overview

Specific Investment Costs	1,500.00	€/kWp
Investment Costs	15,000.00	€
One-off Payments	0.00	€
Incoming Subsidies	0.00	€
Annual Costs	0.00	€/Year
Other Revenue or Savings	0.00	€/Year

Remuneration and Savings

Total Payment from Utility in First Year	0.00	€/Year
First year savings	2,120.03	€/Year
Example Private (Example)		
Energy Price	0.2218	€/kWh
Base Price	6.9	€/Month
Inflation Rate for Energy Price	2	%/Year

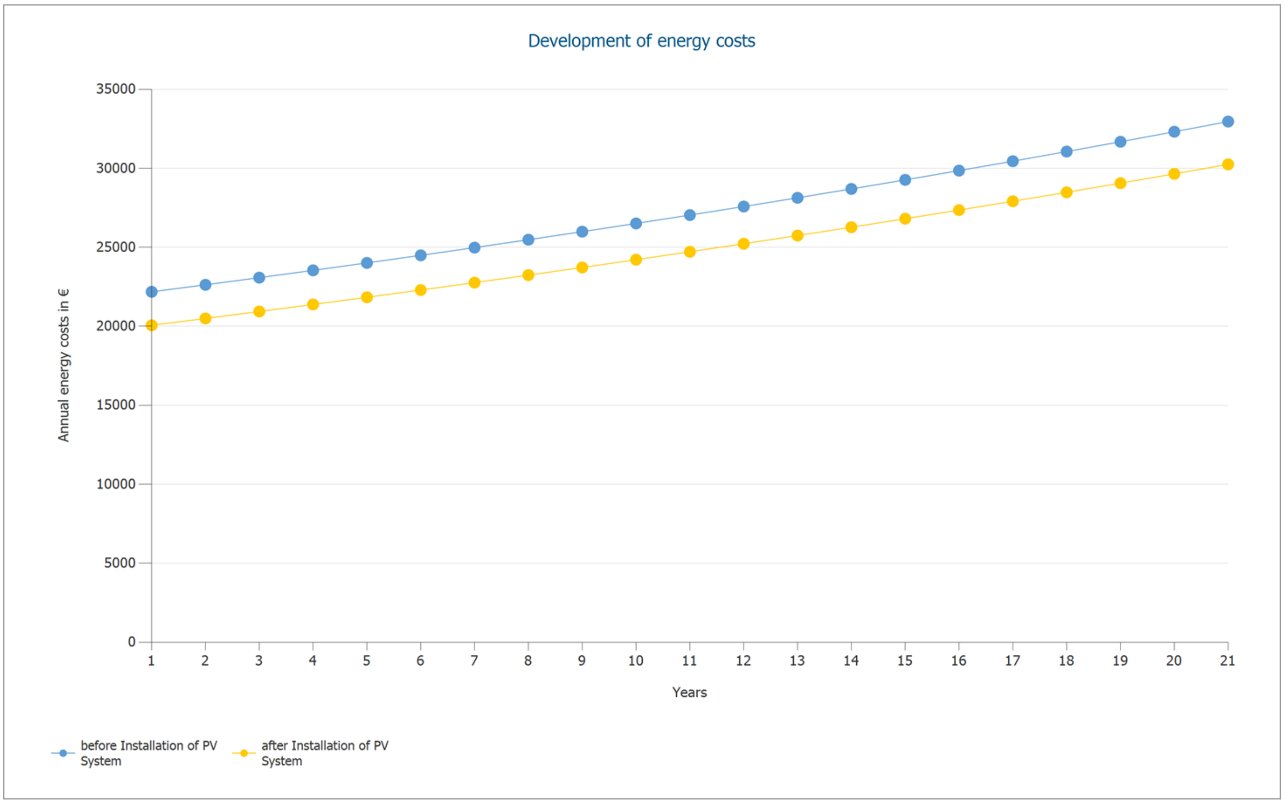


Figure: Development of energy costs

Cash flow

Cash flow

	Year 1	Year 2	Year 3	Year 4	Year 5
Investments	-€15,000.00	€0.00	€0.00	€0.00	€0.00
Electricity Savings	€2,045.06	€2,088.36	€2,080.14	€2,074.18	€2,070.32
Annual Cash Flow	**-€12,954.94**	**€2,088.36**	**€2,080.14**	**€2,074.18**	**€2,070.32**
Accrued Cash Flow (Cash Balance)	-€12,954.94	-€10,866.58	-€8,786.44	-€6,712.27	-€4,641.94

Cash flow

	Year 6	Year 7	Year 8	Year 9	Year 10
Investments	€0.00	€0.00	€0.00	€0.00	€0.00
Electricity Savings	€2,068.42	€2,068.31	€2,069.88	€2,073.00	€2,077.57
Annual Cash Flow	**€2,068.42**	**€2,068.31**	**€2,069.88**	**€2,073.00**	**€2,077.57**
Accrued Cash Flow (Cash Balance)	-€2,573.53	-€505.22	€1,564.66	€3,637.66	€5,715.23

Cash flow

	Year 11	Year 12	Year 13	Year 14	Year 15
Investments	€0.00	€0.00	€0.00	€0.00	€0.00
Electricity Savings	€2,083.48	€2,090.64	€2,098.97	€2,108.39	€2,118.82
Annual Cash Flow	**€2,083.48**	**€2,090.64**	**€2,098.97**	**€2,108.39**	**€2,118.82**
Accrued Cash Flow (Cash Balance)	€7,798.71	€9,889.35	€11,988.32	€14,096.71	€16,215.53

Cash flow

	Year 16	Year 17	Year 18	Year 19	Year 20
Investments	€0.00	€0.00	€0.00	€0.00	€0.00
Electricity Savings	€2,130.21	€2,142.49	€2,155.61	€2,169.51	€2,184.16
Annual Cash Flow	**€2,130.21**	**€2,142.49**	**€2,155.61**	**€2,169.51**	**€2,184.16**
Accrued Cash Flow (Cash Balance)	€18,345.74	€20,488.23	€22,643.83	€24,813.35	€26,997.51

Cash flow

	Year 21
Investments	€0.00
Electricity Savings	€2,199.51
Annual Cash Flow	**€2,199.51**
Accrued Cash Flow (Cash Balance)	€29,197.03

Degradation and inflation rates are applied on a monthly basis over the entire observation period. This is done in the first year.

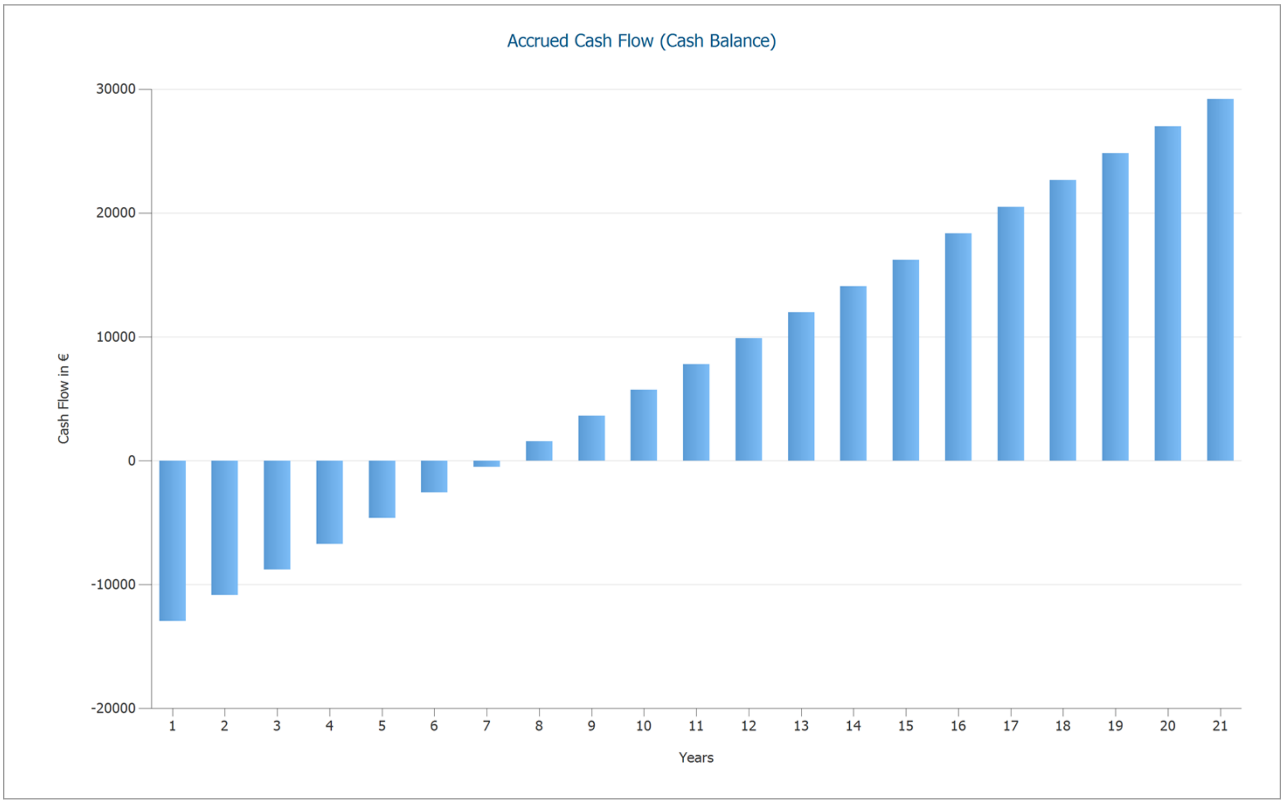


Figure: Accrued Cash Flow (Cash Balance)

Data Sheets

PV Module Data Sheet

PV Module: VERTEX TSM-500-DE18M.08(II) (v1)

Manufacturer	Trina Solar	
Available	Yes	
Electrical Data		
Cell Type	Si monocrystalline	
Half-cell module	Yes	
Cell Count	150	
Number of Bypass Diodes	3	
Loss voltage per bypass diode	1	V
Integrated power optimizer	No	
Only Transformer Inverters suitable	No	
I/V Characteristics at STC		
MPP Voltage	42.8	V
MPP Current	11.69	A
Open Circuit Voltage	51.7	V
Short-Circuit Current	12.28	A
Increase open circuit voltage before stabilisation	0	%
Nominal output	500	W
Fill Factor	78.81	%
Efficiency	20.76	%
I/V Part Load Characteristics		
Values source	Manufacturer/user-created	
Irradiance	200	W/m²
Voltage in MPP at Part Load	42.16	V
Current in MPP at Part Load	2.338	A
Open Circuit Voltage (Part Load)	48.694	V
Short Circuit Current at Part Load	2.458	A
Additional Parameters		
Temperature Coefficient of Voc	-129.2	mV/K
Temperature Coefficient of Isc	4.9	mA/K
Temperature Coefficient of Pmpp	-0.34	%/K
Incident Angle Modifier (IAM)	100	%
Maximum System Voltage	1500	V
Mechanical Data		
Width	1102	mm
Height	2187	mm
Depth	35	mm
Frame Width	35	mm
Weight	26.5	kg

Appendix III

PERFORMANCE . EXPERTISE . RELIABILITY

SD WIND ENERGY

WORLD LEADERS IN SMALL SCALE WIND

SD6

+44 (0) 1560 486 570
www.sd-windenergy.com

PERFORMANCE . EXPERTISE . RELIABILITY

The SD6 is regarded by many as the turbine of choice and has been one of the World's Best Selling Small Wind Turbines for over 25 years.

Renowned for quality and durability, the SD6 is internationally recognised as a market leader in Small Wind.

Continuous Operation is guaranteed due to the innovative downwind design, incorporating the delta rotor. This unique system uses the latest advances in composite technology, allowing the blades to flex and regulate their speed. This ensures the turbine can continue operating and producing energy during extreme wind conditions when alternative wind turbines need to stop to protect themselves.

Utilising hydraulic towers ensures minimum downtime for service inspections, which are only required at 25,000kWh intervals. This offers customers a low cost of ownership compared to alternative wind turbines on the market.

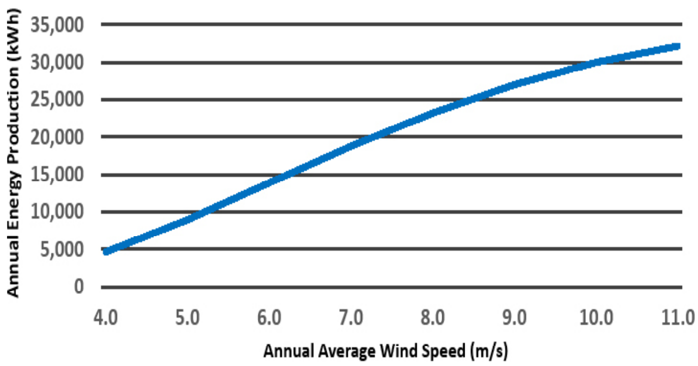
SD Wind Energy delivers affordable energy security to a wide range of customers. The SD6 is fully certified under the MCS & SWCC schemes, ensuring eligibility for incentive programs.

SD6

PRODUCT SPECIFICATION

Rated Power	5.2kW @ 11m/s
Applications	Agricultural, Domestic, Remote Islands, Utility, Telco
Solutions	Grid Tied & Battery Charge, 48V, 300V
Architecture	Downwind, 3 Bladed, Self Regulating
Rotor	5.6m Diameter
Blade Material	Glass Thermoplastic Composite
Generator	Brushless Direct Drive Permanent Magnet
Tower Height Options	9m / 15m / 20m Taperfit Monopole - Hydraulic
Tower Specification	Class 1 Rated / Galvanised Steel
Foundation Options	Pad / Root / Rock Anchor
Cut In Speed	2.5m/s
Cut Out Speed	None - Continuous Operation
Survival Wind Speed	Designed to Class 1 (70m/s)
Warranty	5 Years
Cold Climate Options	Available on Request
Colour Options	Light Grey (RAL7035) Black (RAL9005)

ANNUAL ENERGY PRODUCTION



SECURE YOUR ENERGY FUTURE TODAY WITH SD WIND ENERGY

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Global Head Office
Wardhead Park, Stewarton
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info@sd-windenergy.com
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APPROVED PRODUCT

MCS

SMALL WIND
SW CC
CERTIFICATION COUNCIL
CERTIFIED
SMALL WIND TURBINE

Inverter Data Sheet

Inverter: STP8.0-3AV-40 (v1)

Manufacturer	SMA Solar Technology AG	
Available	Yes	
Electrical data - DC		
DC nominal output	8.18	kW
Max. DC Power	8.18	kW
Nom. DC Voltage	260	V
Max. Input Voltage	1000	V
Max. Input Current	32	A
Number of DC Inlets	2	
Electrical data - AC		
AC Power Rating	8	kW
Max. AC Power	8	kVA
Number of Phases	3	
With Transformer	No	
Electrical data - other		
Change in Efficiency when Input Voltage deviates from Rated Voltage	-0.42	%/100V
Min. Feed-in Power	30	W
Standby Consumption	0	W
Night Consumption	5	W
MPP Tracker		
Output Range < 20% of Power Rating	99.9	%
Output Range > 20% of Power Rating	99.9	%
Count of MPP Trackers	2	
Count of different trackers	2	
MPP Tracker Type 1		
Quantity	1	
MPP Tracker	1	
Max. Input Current	20	A
Max. Input Power	8.18	kW
Min. MPP Voltage	125	V
Max. MPP Voltage	800	V
MPP Tracker Type 2		
Quantity	1	
MPP Tracker	2	
Max. Input Current	12	A
Max. Input Power	8.18	kW
Min. MPP Voltage	125	V
Max. MPP Voltage	800	V

Plans and parts list

Circuit Diagram

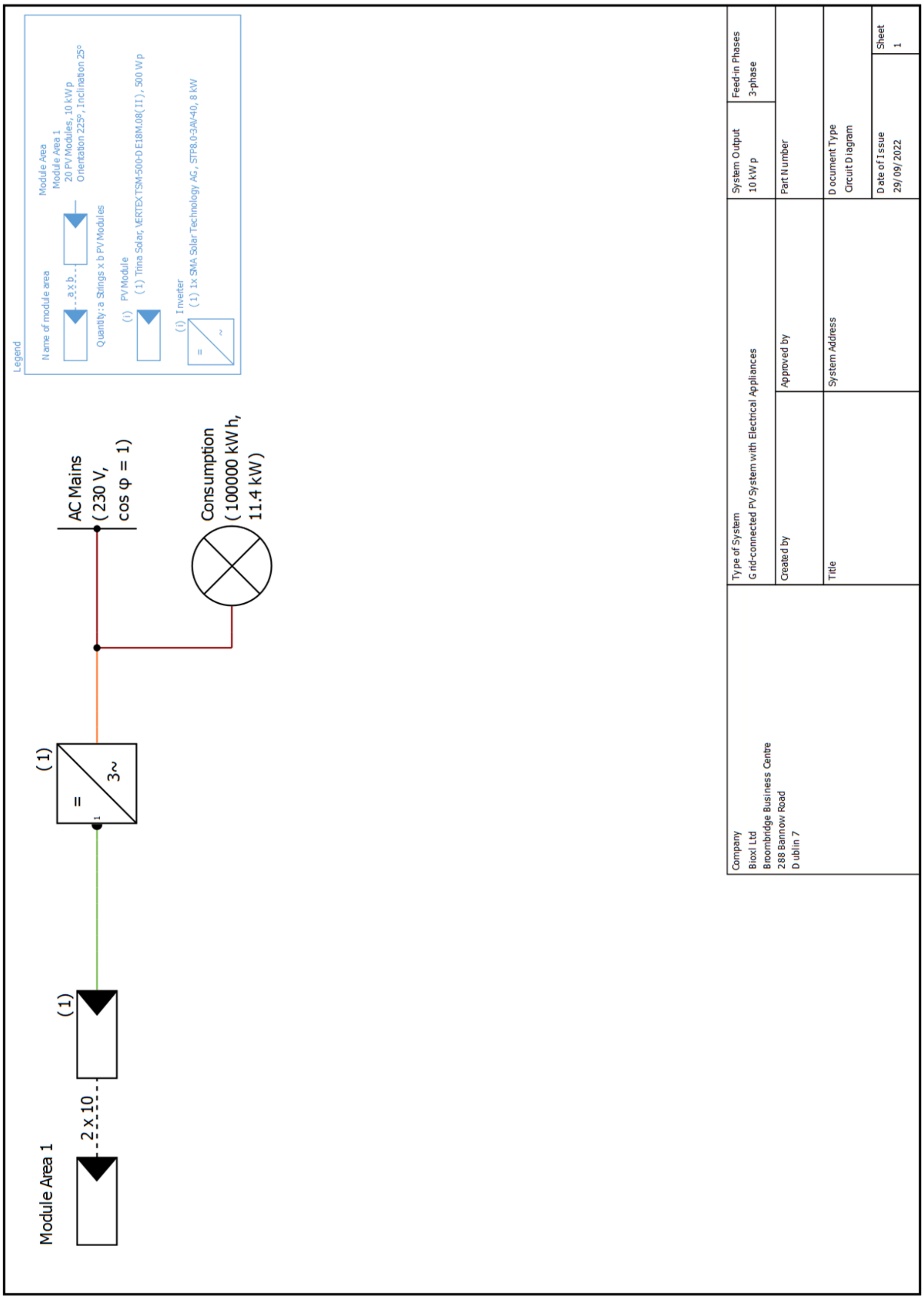


Figure: Circuit Diagram

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Trina Solar	VERTEX TSM-500-DE18M.08(II)	20	Piece
2	Inverter		SMA Solar Technology AG	STP8.0-3AV-40	1	Piece

Appendix IV

Polecat Springs Group Water Scheme (GWS), working with Veolia, Clár ICH and Eco Smart has become the first Group Water Scheme to use renewable energy to directly power its water treatment plant.

Located near Elphin, County Roscommon, the site will be able to reduce energy costs by 70%, and cut carbon emissions following the launch of a new solar energy project. The photovoltaic (PV) system will directly help the environment by reducing CO2 emissions and enable the local community to benefit from water treatment cost savings.

Polecat Springs GWS supplies water to rural properties covering 80 square kilometres stretching from Elphin Town northwards to Carrick on Shannon and from Ballinameen eastwards to the River Shannon and is operated as a community co-operative. Installation of the new solar panels means electricity generated on site, which was previously drawn from the National Grid, will now be used to power the various stages of the water treatment process.

According to Martin Beirne of Polecat Springs Group Water Scheme solar energy was chosen as it provided the best solution due to the location of the site and the amount of electricity required. In addition, there is also the future possibility to integrate battery storage at the site, which has the potential to make the water treatment plant 100% self-sufficient.

Operated under a contract by Veolia, the project has been supported by the Federation Of Group Water Schemes and backed by a Sustainable Energy Authority of Ireland grant covering 50% of the investment. The resultant energy cost savings will enable the project to pay for itself within six years.

In a joint statement the Cathaoirleach of Roscommon County Council, Councillor Paschal Fitzmaurice and the Chief Executive, Eugene Cummins said: “It is great to see the community around Polecat Springs investing in a more sustainable future that will see significant savings in energy and will contribute in a very positive way to climate change at a local level. This community initiative is an example to all and hopefully other schemes and communities will follow the example set by the Polecat Springs Group Water Scheme”.

Pat Lavin of Eco Smart, who worked with Veolia to deliver the project, said: “The principle aims of this project were to reduce the GWS’s carbon footprint, reduce energy and running costs at the plant, and set an example for other similar schemes in terms of sustainable development and operations for water treatment plants.”

Joe Higgins, Regional Director, Veolia added: “While developments similar to the one at Polecat Springs have been done at a municipal level, this is the first GWS that is using sustainable energy to power its water treatment plant operations. Veolia is delighted to have been involved in the project and we hope that more water schemes will invest in sustainable energy in the future.”

The Group Water Schemes’ Programme was introduced in 1962 to provide grant aid to rural communities for the construction of water distribution systems from local water sources. Communities set up voluntary co-operative structures known as Group Water Schemes to privately manage these water systems, with operating costs funded through contributions from Group members and Central Government subsidies.

Appendix V

Energy Co-operatives Ireland Ltd

energyco-ops.ie

Who we are:

We are a co-operative renewable energy consultancy promoting community access to the benefits of renewable energy. Our membership comprises of renewable energy experts, experienced co-operative regulations advisers, an expert project managers, financial advisers and a highly skilled communications and media team. Energy Co-operatives Ireland has an open democratic structure. We support co-operatives that have as wide a community membership as possible and seek to distribute benefits to the community as a whole. We have been successful in assisting community co-ops at every stage of their development from their first public meeting to the successful processing of a planning application and their sourcing of finances to bring the projects to reality.

Energy Co-ops Aims:

- BUILDING A NATIONAL NETWORK OF STRONG COMMUNITY CO-OPS
- DEVELOPING RENEWABLE ENERGY TECHNOLOGIES
- PROMOTING THE SMART GRID
- REPLACING IMPORTED CARBON FUELS WITH SUSTAINABLE ALTERNATIVES

Funding Your Project

A huge challenge facing community enterprises of any sort is access to funding.
At ECI we can offer access to a range of funding instruments to suit your community's need.

DAYSE

This is a platform managed whereby a community group or charity can leverage the goodwill of local business associations and private individuals to raise funds for small-scale energy conservation and generation projects.

State supports

ECI can help your community to acquire funds for energy conservation and smaller scale generation projects on a matching funds basis.

Philanthropic Funds

With our help, your community project may be able to raise funds from our contacts in Philanthropic organisations. Funds up to €500,000 are available on a low-interest loan basis.

Community Share-holding Platforms

Larger scale projects (greater than €500,000) can be funded through an equity platform.

For Further Information See: https://www.energyco-ops.ie/

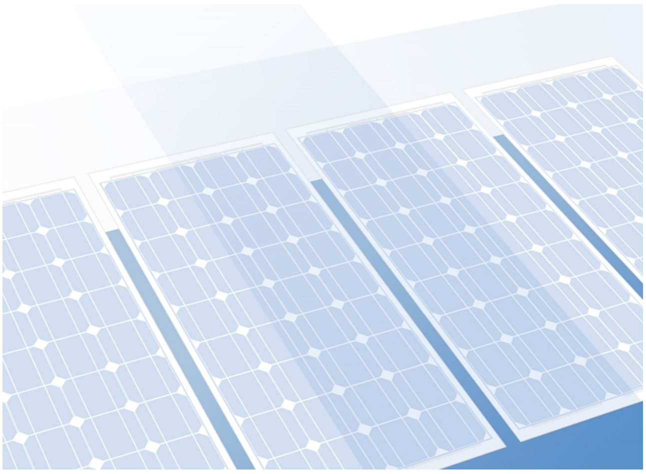
Bioxl Ltd
Broombridge Business Centre
288 Bannow Road
Dublin 7

Contact person:
Tom Bruton
E-Mail: tom.bruton@bioxl.ie

29/09/2022

Your PV system from Bioxl Ltd

Address of Installation



Project Overview

PV System

Grid-connected PV System with Electrical Appliances	
Climate Data	Belmullet, IRL (1996 - 2015)
Values source	Meteonorm 8.1
PV Generator Output	10 kWp
PV Generator Surface	48.2 m²
Number of PV Modules	20
Number of Inverters	1

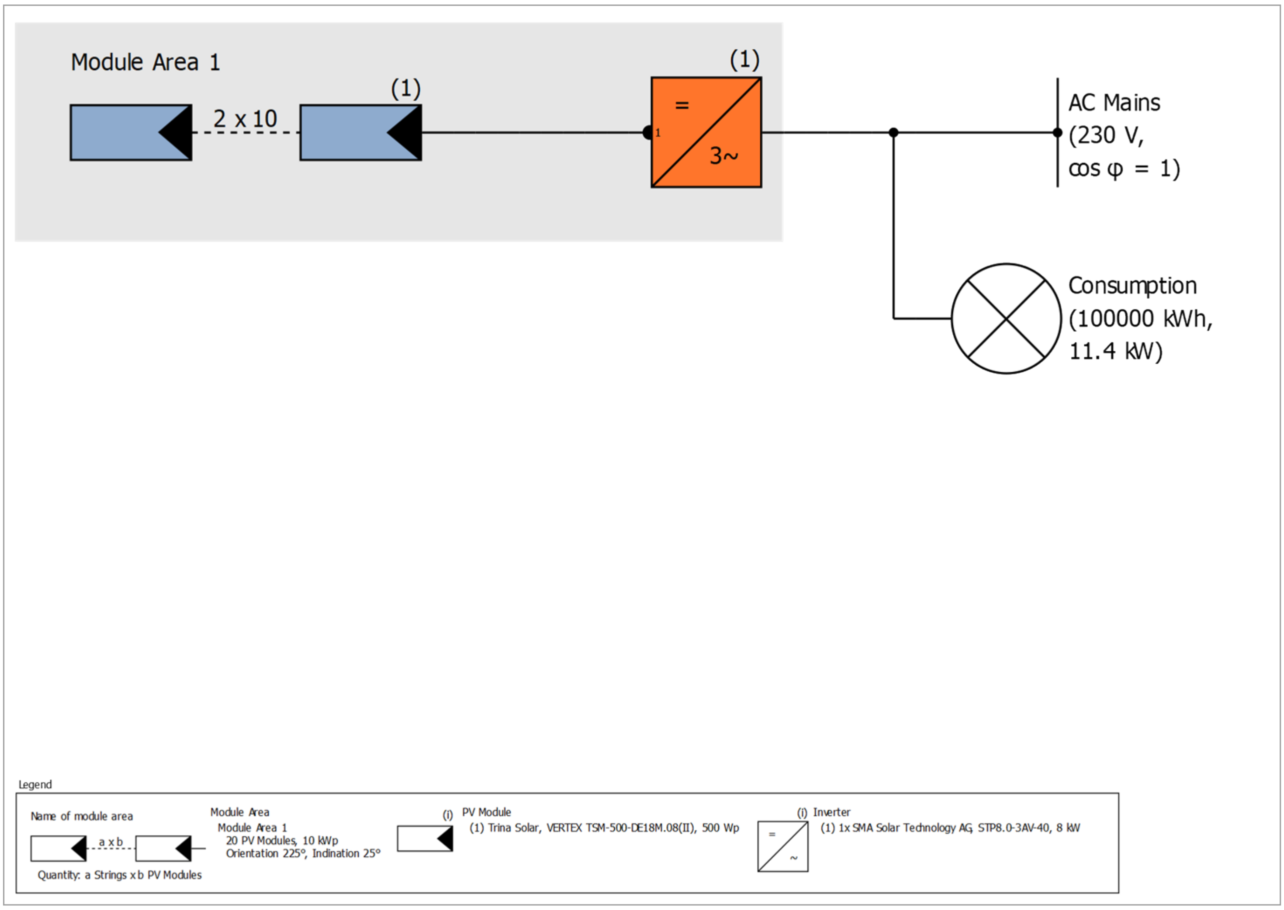


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	10.00	kWp
Spec. Annual Yield	963.61	kWh/kWp
Performance Ratio (PR)	90.83	%
PV Generator Energy (AC grid)	9,653	kWh/Year
Own Consumption	9,653	kWh/Year
Down-regulation at Feed-in Point	0	kWh/Year
Grid Feed-in	0	kWh/Year
Own Power Consumption	100.0	%
CO_2 Emissions avoided	4,529	kg / year
Level of Self-sufficiency	9.7	%

Financial Analysis

Your Gain

Total investment costs	15,000.00	€
Internal Rate of Return (IRR)	13.80	%
Amortization Period	7.2	Years
Electricity Production Costs	0.0826	€/kWh
Energy Balance/Feed-in Concept	Surplus Feed-in	

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	Grid-connected PV System with Electrical Appliances

Climate Data

Location	Belmullet, IRL (1996 - 2015)
Values source	Meteonorm 8.1
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Consumption

Total Consumption	100000 kWh
Load with constant energy consumption over the whole year	100000 kWh
Load Peak	11.4 kW

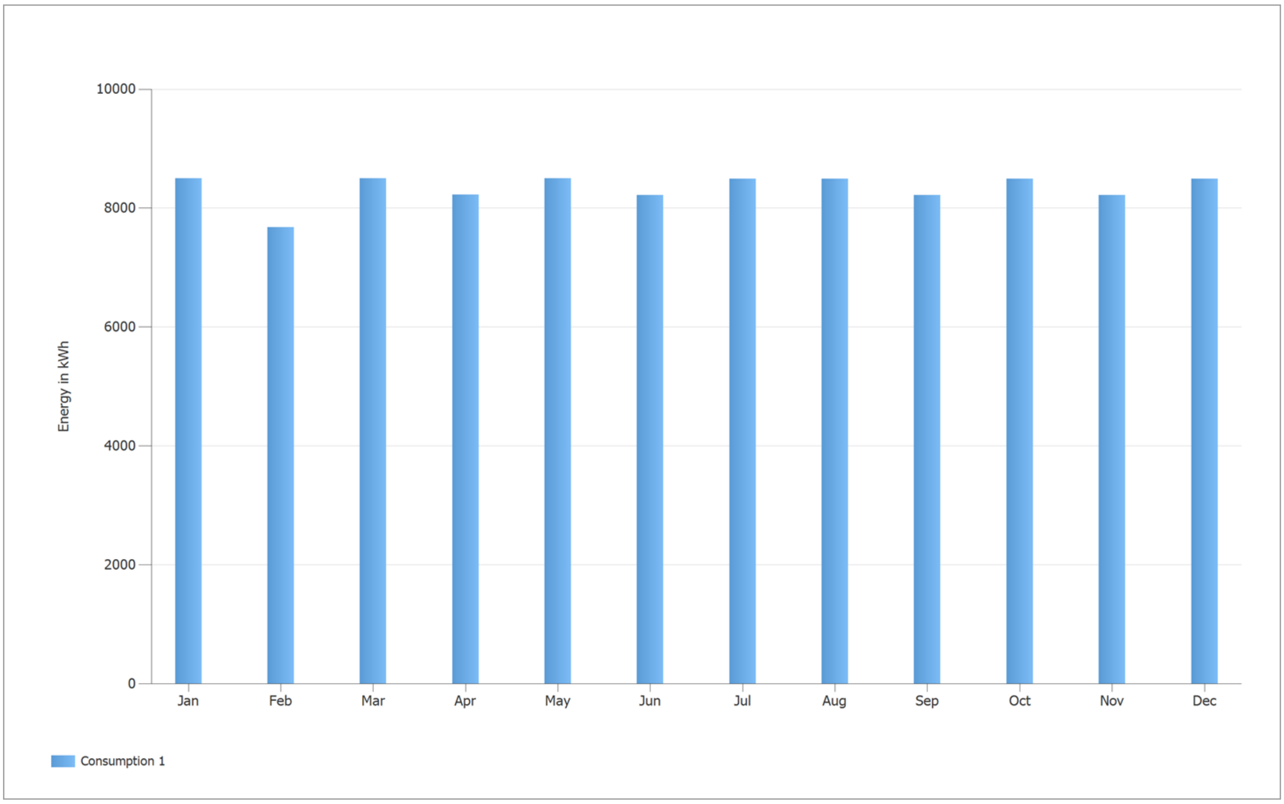


Figure: Consumption

Module Areas

1. Module Area - Module Area 1

PV Generator, 1. Module Area - Module Area 1

Name	Module Area 1	
PV Modules	20 x VERTEX TSM-500-DE18M.08(II) (v1)	
Manufacturer	Trina Solar	
Inclination	25	°
Orientation	Southwest 225	°
Installation Type	Roof parallel	
PV Generator Surface	48.2	m²

Inverter configuration

Configuration 1

Module Area	Module Area 1
Inverter 1	
Model	STP8.0-3AV-40 (v1)
Manufacturer	SMA Solar Technology AG
Quantity	1
Sizing Factor	125 %
Configuration	MPP 1+2: 2 x 10

AC Mains

AC Mains

Number of Phases	3	
Mains voltage between phase and neutral	230	V
Displacement Power Factor (cos phi)	+/- 1	

Simulation Results

Results Total System

PV System

PV Generator Output	10.00	kWp
Spec. Annual Yield	963.61	kWh/kWp
Performance Ratio (PR)	90.83	%
PV Generator Energy (AC grid)	9,653	kWh/Year
Own Consumption	9,653	kWh/Year
Down-regulation at Feed-in Point	0	kWh/Year
Grid Feed-in	0	kWh/Year
Own Power Consumption	100.0	%
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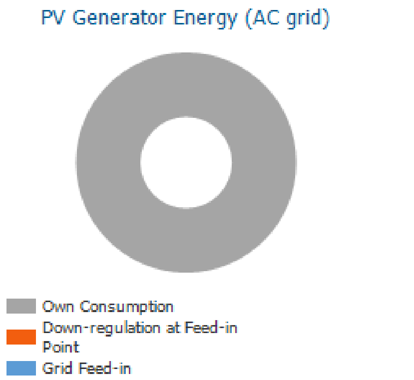
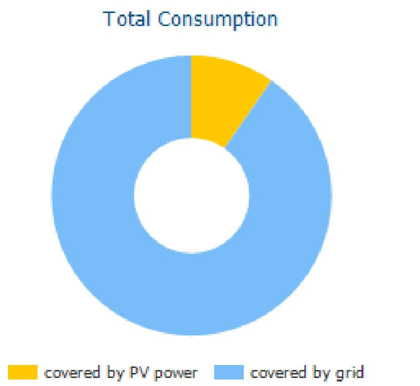


Appliances

Appliances	100,000	kWh/Year
Standby Consumption (Inverter)	17	kWh/Year
Total Consumption	100,017	kWh/Year
covered by PV power	9,653	kWh/Year
covered by grid	90,364	kWh/Year
Solar Fraction	9.7	%



Level of Self-sufficiency

Total Consumption	100,017	kWh/Year
covered by grid	90,364	kWh/Year
Level of Self-sufficiency	9.7	%

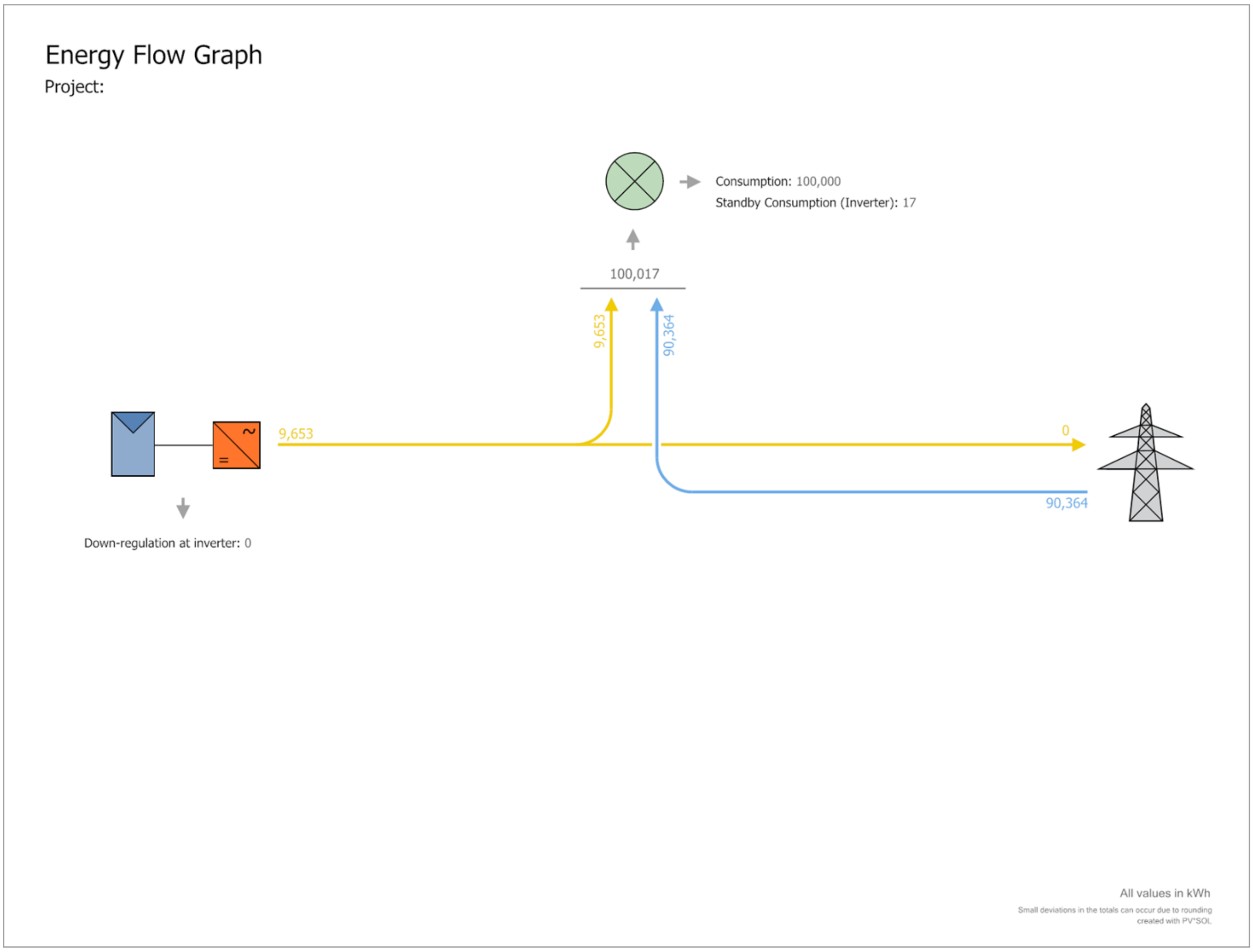


Figure: Energy flow

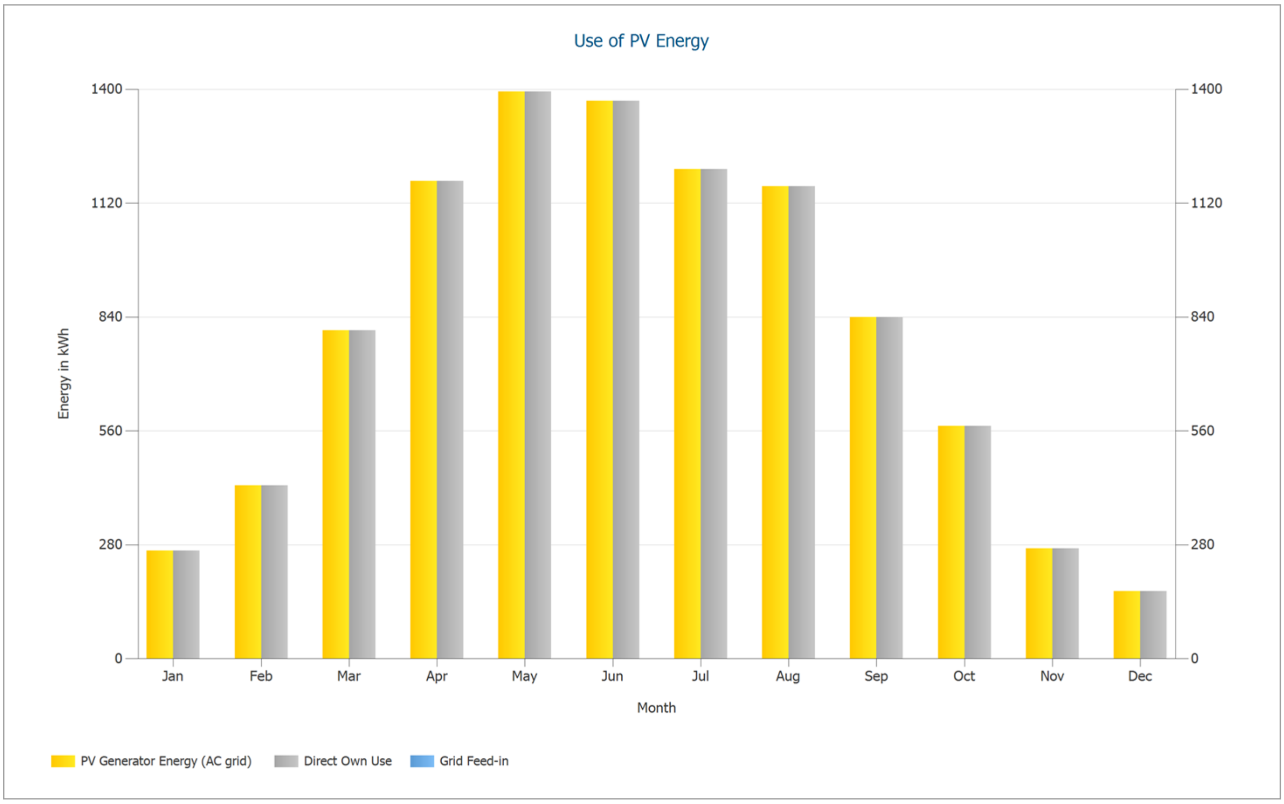


Figure: Use of PV Energy

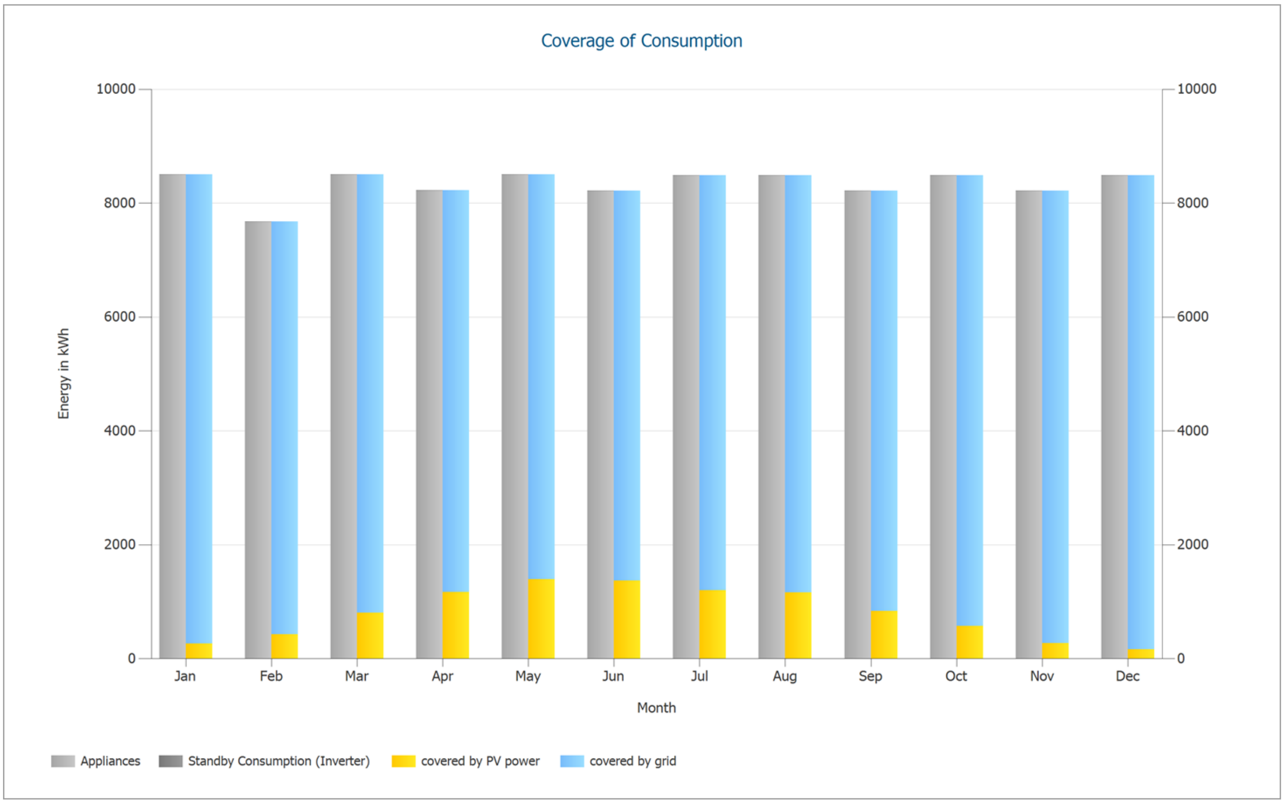


Figure: Coverage of Consumption

Financial Analysis

Overview

System Data

Grid Feed-in in the first year (incl. module degradation)	0 kWh/Year
PV Generator Output	10 kWp
Start of Operation of the System	29/09/2022
Assessment Period	20 Years
Interest on Capital	1 %

Economic Parameters

Internal Rate of Return (IRR)	13.80 %
Accrued Cash Flow (Cash Balance)	29,197.03 €
Amortization Period	7.2 Years
Electricity Production Costs	0.0826 €/kWh

Payment Overview

Specific Investment Costs	1,500.00 €/kWp
Investment Costs	15,000.00 €
One-off Payments	0.00 €
Incoming Subsidies	0.00 €
Annual Costs	0.00 €/Year
Other Revenue or Savings	0.00 €/Year

Remuneration and Savings

Total Payment from Utility in First Year	0.00 €/Year
First year savings	2,120.03 €/Year
Example Private (Example)	
Energy Price	0.2218 €/kWh
Base Price	6.9 €/Month
Inflation Rate for Energy Price	2 %/Year

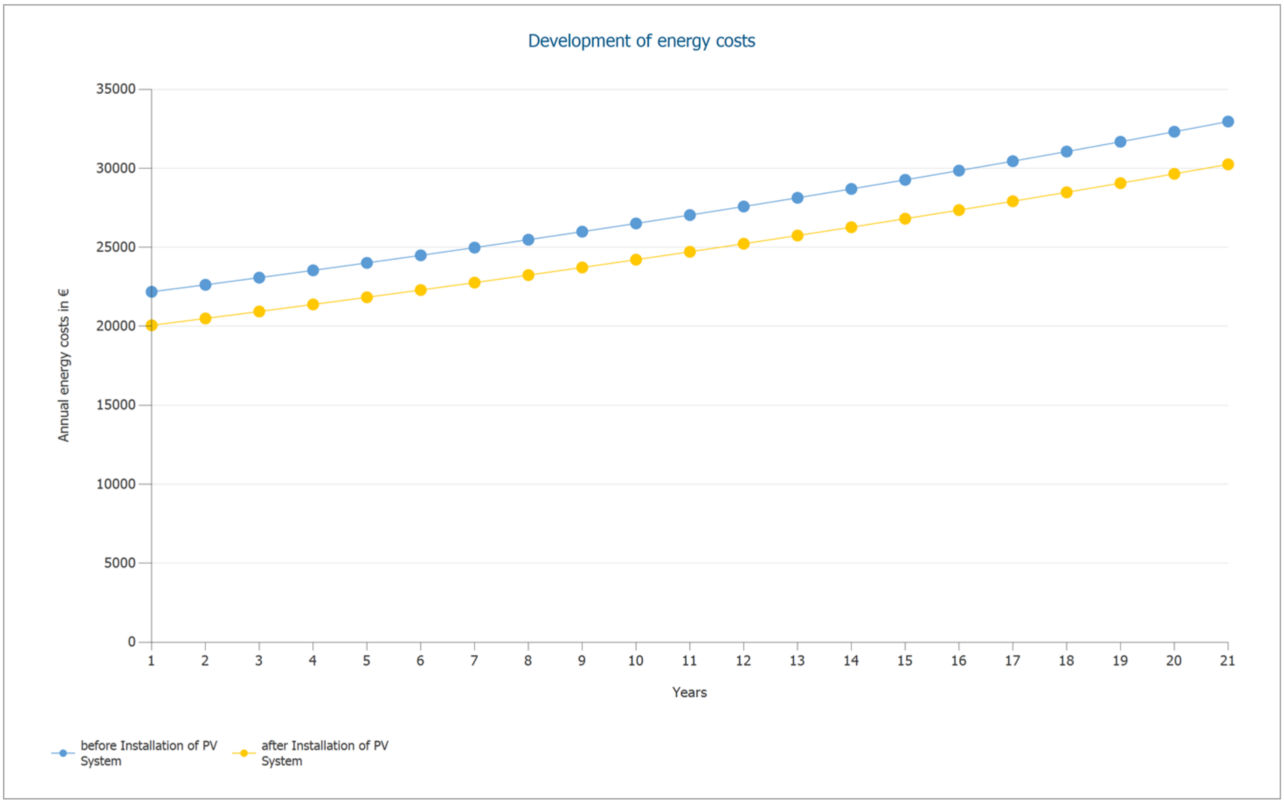


Figure: Development of energy costs

Cash flow

Cash flow

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Cash flow

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Cash flow

	Year 16	Year 17	Year 18	Year 19	Year 20
Investments	€0.00	€0.00	€0.00	€0.00	€0.00
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Annual Cash Flow	**€2,130.21**	**€2,142.49**	**€2,155.61**	**€2,169.51**	**€2,184.16**
Accrued Cash Flow (Cash Balance)	€18,345.74	€20,488.23	€22,643.83	€24,813.35	€26,997.51

Cash flow

	Year 21
Investments	€0.00
Electricity Savings	€2,199.51
Annual Cash Flow	**€2,199.51**
Accrued Cash Flow (Cash Balance)	€29,197.03

Degradation and inflation rates are applied on a monthly basis over the entire observation period. This is done in the first year.

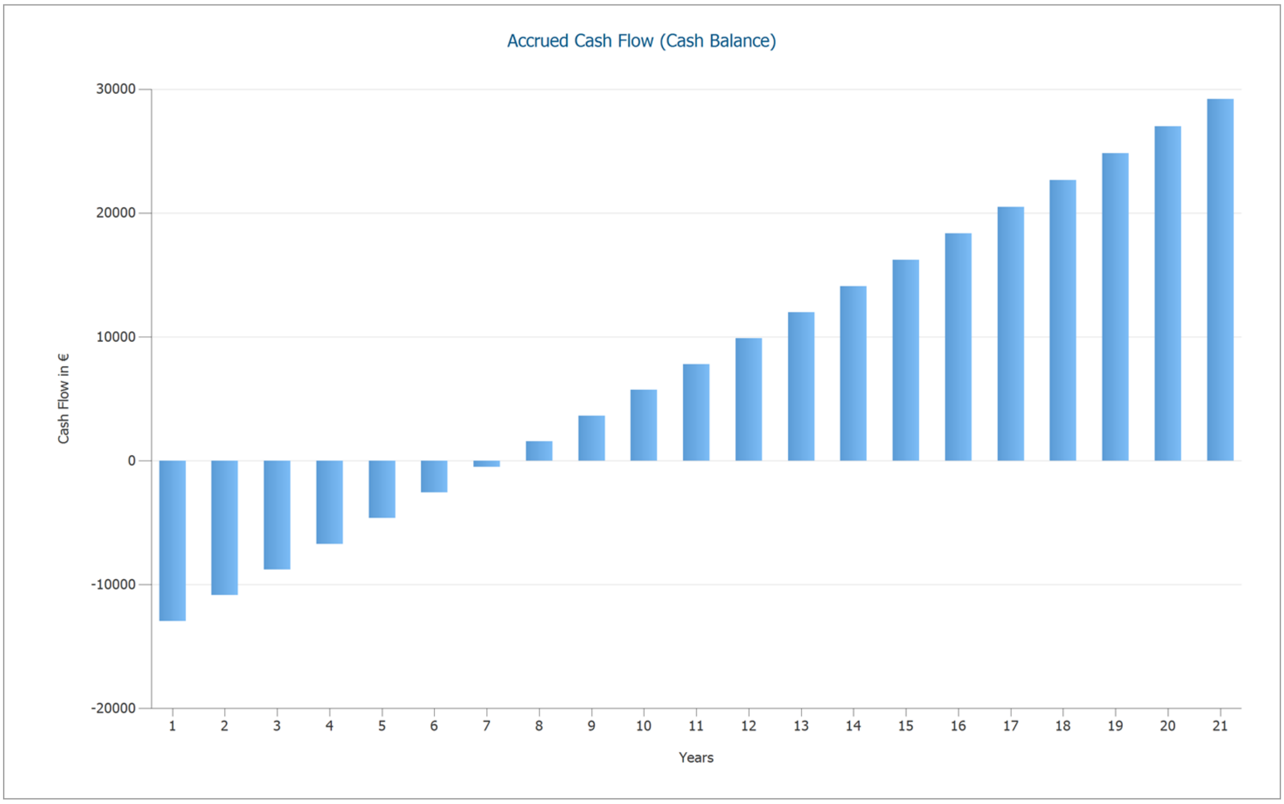


Figure: Accrued Cash Flow (Cash Balance)

Data Sheets

PV Module Data Sheet

PV Module: VERTEX TSM-500-DE18M.08(II) (v1)

Manufacturer	Trina Solar	
Available	Yes	
Electrical Data		
Cell Type	Si monocrystalline	
Half-cell module	Yes	
Cell Count	150	
Number of Bypass Diodes	3	
Loss voltage per bypass diode	1	V
Integrated power optimizer	No	
Only Transformer Inverters suitable	No	
I/V Characteristics at STC		
MPP Voltage	42.8	V
MPP Current	11.69	A
Open Circuit Voltage	51.7	V
Short-Circuit Current	12.28	A
Increase open circuit voltage before stabilisation	0	%
Nominal output	500	W
Fill Factor	78.81	%
Efficiency	20.76	%
I/V Part Load Characteristics		
Values source	Manufacturer/user-created	
Irradiance	200	W/m²
Voltage in MPP at Part Load	42.16	V
Current in MPP at Part Load	2.338	A
Open Circuit Voltage (Part Load)	48.694	V
Short Circuit Current at Part Load	2.458	A
Additional Parameters		
Temperature Coefficient of Voc	-129.2	mV/K
Temperature Coefficient of Isc	4.9	mA/K
Temperature Coefficient of Pmpp	-0.34	%/K
Incident Angle Modifier (IAM)	100	%
Maximum System Voltage	1500	V
Mechanical Data		
Width	1102	mm
Height	2187	mm
Depth	35	mm
Frame Width	35	mm
Weight	26.5	kg

Inverter Data Sheet

Inverter: STP8.0-3AV-40 (v1)

Manufacturer	SMA Solar Technology AG	
Available	Yes	
Electrical data - DC		
DC nominal output	8.18	kW
Max. DC Power	8.18	kW
Nom. DC Voltage	260	V
Max. Input Voltage	1000	V
Max. Input Current	32	A
Number of DC Inlets	2	
Electrical data - AC		
AC Power Rating	8	kW
Max. AC Power	8	kVA
Number of Phases	3	
With Transformer	No	
Electrical data - other		
Change in Efficiency when Input Voltage deviates from Rated Voltage	-0.42	%/100V
Min. Feed-in Power	30	W
Standby Consumption	0	W
Night Consumption	5	W
MPP Tracker		
Output Range < 20% of Power Rating	99.9	%
Output Range > 20% of Power Rating	99.9	%
Count of MPP Trackers	2	
Count of different trackers	2	
MPP Tracker Type 1		
Quantity	1	
MPP Tracker	1	
Max. Input Current	20	A
Max. Input Power	8.18	kW
Min. MPP Voltage	125	V
Max. MPP Voltage	800	V
MPP Tracker Type 2		
Quantity	1	
MPP Tracker	2	
Max. Input Current	12	A
Max. Input Power	8.18	kW
Min. MPP Voltage	125	V
Max. MPP Voltage	800	V

Plans and parts list

Circuit Diagram

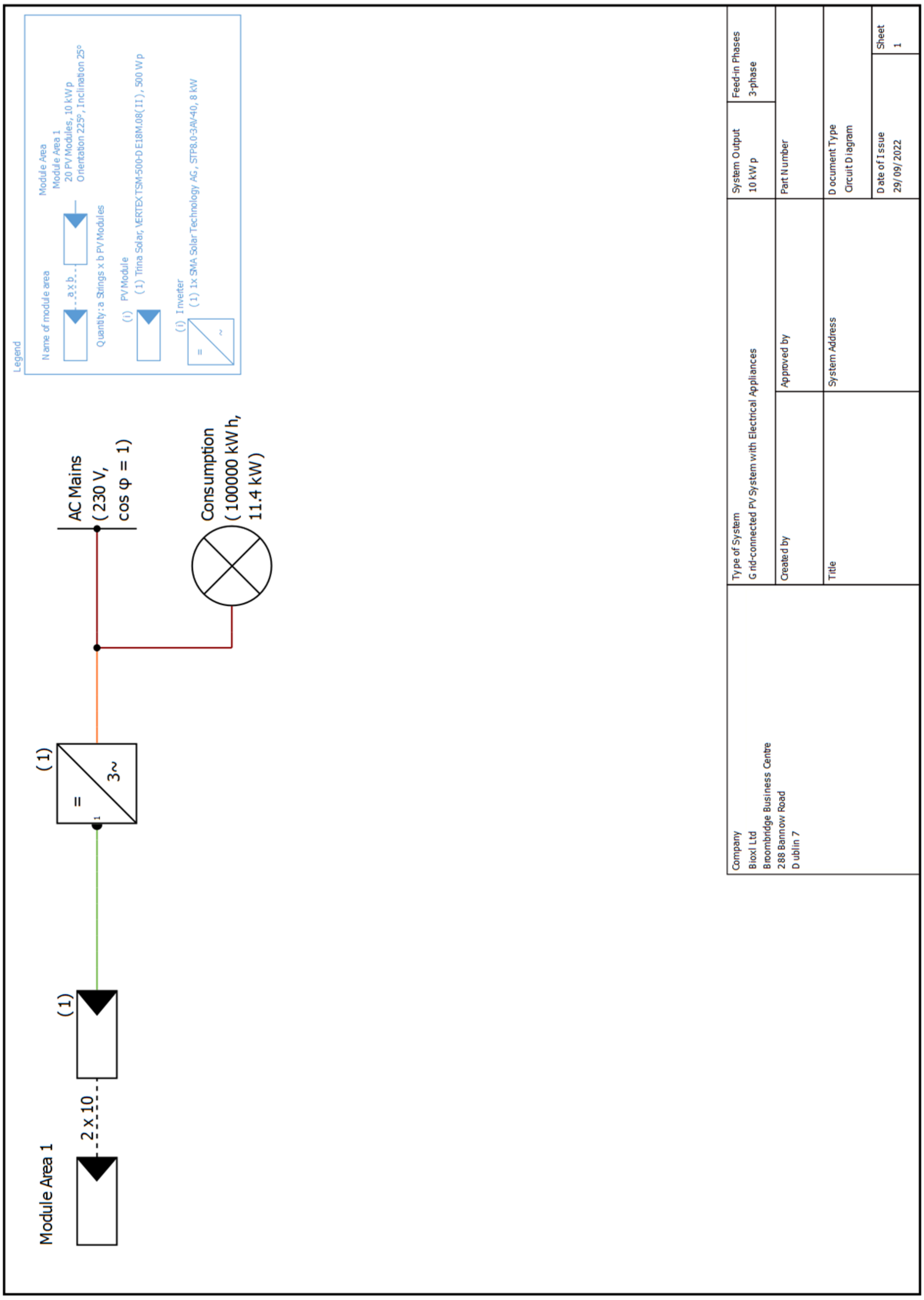


Figure: Circuit Diagram

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Trina Solar	VERTEX TSM-500-DE18M.08(II)	20	Piece
2	Inverter		SMA Solar Technology AG	STP8.0-3AV-40	1	Piece

Appendix II

Design 1 Killeen, Killeen, mayo

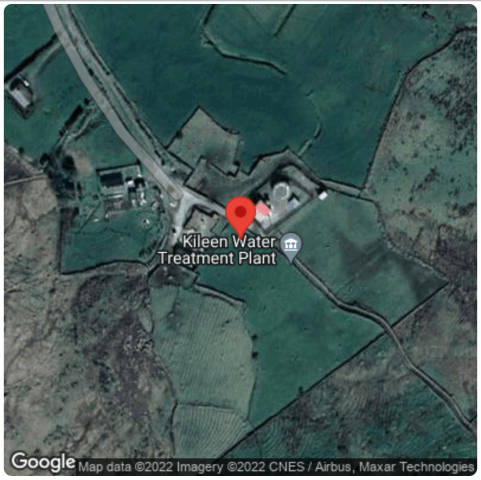
Report

Project Name	Killeen
Project Address	Killeen, mayo
Prepared By	Tom Bruton Chartered Engineer tom.bruton@bioxl.ie

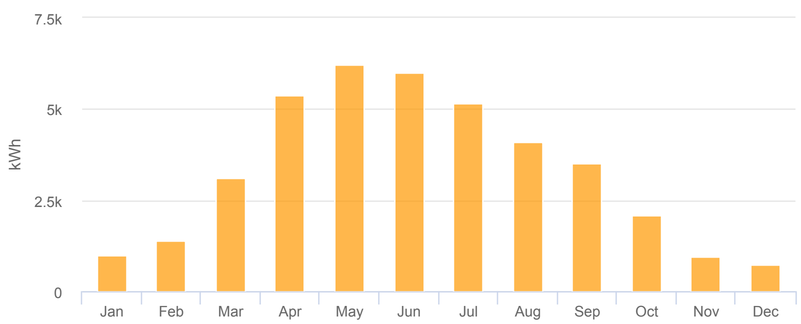
System Metrics

Design	Design 1
Module DC Nameplate	48.0 kW
Inverter AC Nameplate	48.1 kW Load Ratio: 1.00
Annual Production	39.58 MWh
Performance Ratio	87.5%
kWh/kWp	824.5
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
Simulator Version	f57c42ab6e-379fc51964-2504af6b08-813978d04d

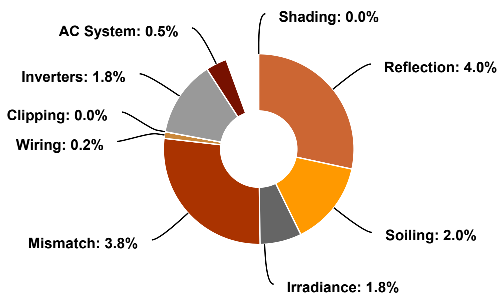
Project Location



Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	857.9	
	POA Irradiance	941.9	9.8%
	Shaded Irradiance	941.9	0.0%
	Irradiance after Reflection	904.6	-4.0%
	Irradiance after Soiling	886.5	-2.0%
	Total Collector Irradiance	**886.5**	**0.0%**
Energy (kWh)	Nameplate	42,580.7	
	Output at Irradiance Levels	41,832.5	-1.8%
	Output at Cell Temperature Derate	42,156.7	0.8%
	Output After Mismatch	40,568.6	-3.8%
	Optimal DC Output	40,505.7	-0.2%
	Constrained DC Output	40,505.6	0.0%
	Inverter Output	39,775.4	-1.8%
	Energy to Grid	**39,576.5**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		11.3 °C
	Avg. Operating Cell Temp		15.8 °C
Simulation Metrics			
	Operating Hours		4564
	Solved Hours		4564

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model
Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.075	3°C
Flush Mount	-2.81	-0.0455	0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Module Characterizations

Module	Uploaded By	Characterization
TSM-500DE18M(II) (Trina Solar)	HelioScope	Spec Sheet Characterization, PAN

Component Characterizations

Device	Uploaded By	Characterization
Sunny Tripower 24000TL-US (SMA)	HelioScope	Modified CEC

Components

Component	Name	Count
Inverters	Sunny Tripower 24000TL-US (SMA)	2 (48.1 kW)
Strings	10 AWG (Copper)	6 (46.8 m)
Module	Trina Solar, TSM-500DE18M(II) (500W)	96 (48.0 kW)

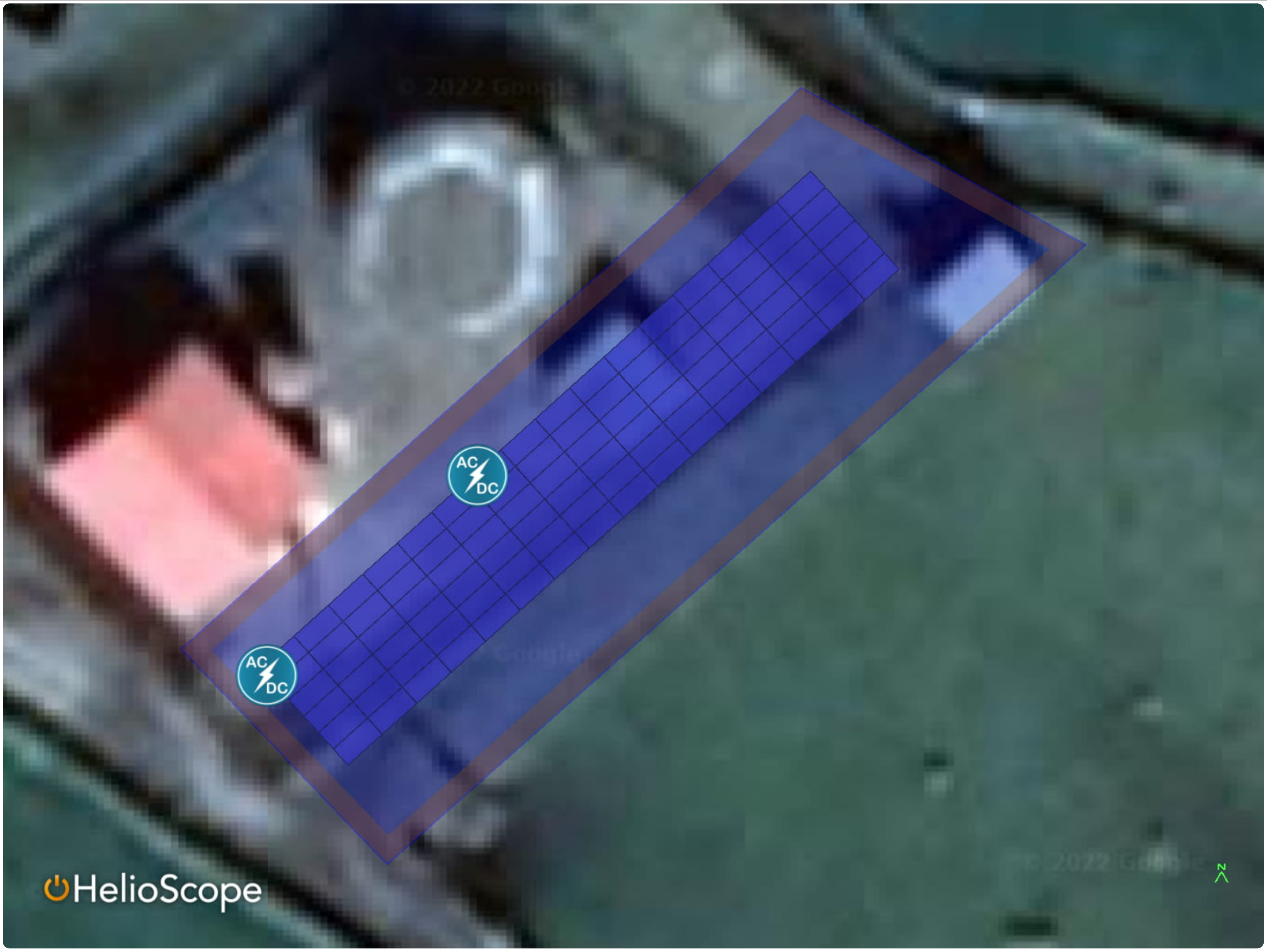
Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	4-17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	20°	138°	2.5 m	6x8	2	96	48.0 kW

Detailed Layout



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Rated Power	5.2kW @ 11m/s
Applications	Agricultural, Domestic, Remote Islands, Utility, Telco
Solutions	Grid Tied & Battery Charge, 48V, 300V
Architecture	Downwind, 3 Bladed, Self Regulating
Rotor	5.6m Diameter
Blade Material	Glass Thermoplastic Composite
Generator	Brushless Direct Drive Permanent Magnet
Tower Height Options	9m / 15m / 20m Taperfit Monopole - Hydraulic
Tower Specification	Class 1 Rated / Galvanised Steel
Foundation Options	Pad / Root / Rock Anchor
Cut In Speed	2.5m/s
Cut Out Speed	None - Continuous Operation
Survival Wind Speed	Designed to Class 1 (70m/s)
Warranty	5 Years
Cold Climate Options	Available on Request
Colour Options	Light Grey (RAL7035) Black (RAL9005)

The SD6 is regarded by many as the turbine of choice and has been one of the World's Best Selling Small Wind Turbines for over 25 years.

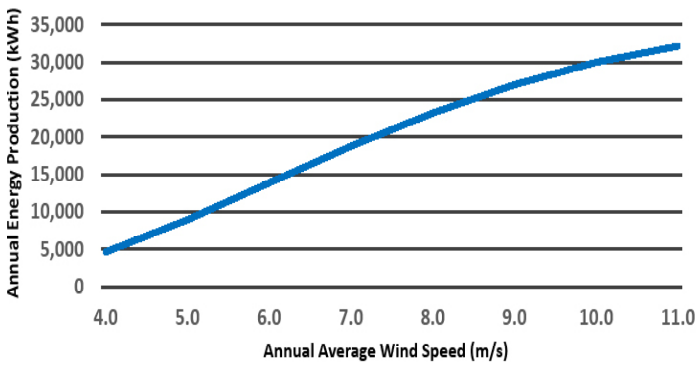
Renowned for quality and durability, the SD6 is internationally recognised as a market leader in Small Wind.

Continuous Operation is guaranteed due to the innovative downwind design, incorporating the delta rotor. This unique system uses the latest advances in composite technology, allowing the blades to flex and regulate their speed. This ensures the turbine can continue operating and producing energy during extreme wind conditions when alternative wind turbines need to stop to protect themselves.

Utilising hydraulic towers ensures minimum downtime for service inspections, which are only required at 25,000kWh intervals. This offers customers a low cost of ownership compared to alternative wind turbines on the market.

SD Wind Energy delivers affordable energy security to a wide range of customers. The SD6 is fully certified under the MCS & SWCC schemes, ensuring eligibility for incentive programs.

ANNUAL ENERGY PRODUCTION



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Document: SDMK106

Appendix IV

Polecat Springs Group Water Scheme (GWS), working with Veolia, Clár ICH and Eco Smart has become the first Group Water Scheme to use renewable energy to directly power its water treatment plant.

Located near Elphin, County Roscommon, the site will be able to reduce energy costs by 70%, and cut carbon emissions following the launch of a new solar energy project. The photovoltaic (PV) system will directly help the environment by reducing CO2 emissions and enable the local community to benefit from water treatment cost savings.

Polecat Springs GWS supplies water to rural properties covering 80 square kilometres stretching from Elphin Town northwards to Carrick on Shannon and from Ballinameen eastwards to the River Shannon and is operated as a community co-operative. Installation of the new solar panels means electricity generated on site, which was previously drawn from the National Grid, will now be used to power the various stages of the water treatment process.

According to Martin Beirne of Polecat Springs Group Water Scheme solar energy was chosen as it provided the best solution due to the location of the site and the amount of electricity required. In addition, there is also the future possibility to integrate battery storage at the site, which has the potential to make the water treatment plant 100% self-sufficient.

Operated under a contract by Veolia, the project has been supported by the Federation Of Group Water Schemes and backed by a Sustainable Energy Authority of Ireland grant

Appendix V

Energy Co-operatives Ireland Ltd

energyco-ops.ie

Who we are:

We are a co-operative renewable energy consultancy promoting community access to the benefits of renewable energy. Our membership comprises of renewable energy experts, experienced co-operative regulations advisers, an expert project managers, financial advisers and a highly skilled communications and media team. Energy Co-operatives Ireland has an open democratic structure. We support co-operatives that have as wide a community membership as possible and seek to distribute benefits to the community as a whole. We have been successful in assisting community co-ops at every stage of their development from their first public meeting to the successful processing of a planning application and their sourcing of finances to bring the projects to reality.

Energy Co-ops Aims:

- BUILDING A NATIONAL NETWORK OF STRONG COMMUNITY CO-OPS
- DEVELOPING RENEWABLE ENERGY TECHNOLOGIES
- PROMOTING THE SMART GRID
- REPLACING IMPORTED CARBON FUELS WITH SUSTAINABLE ALTERNATIVES

Funding Your Project

A huge challenge facing community enterprises of any sort is access to funding.
At ECI we can offer access to a range of funding instruments to suit your community's need.

DAYSE

This is a platform managed whereby a community group or charity can leverage the goodwill of local business associations and private individuals to raise funds for small-scale energy conservation and generation projects.

State supports

ECI can help your community to acquire funds for energy conservation and smaller scale generation projects on a matching funds basis.

Philanthropic Funds

With our help, your community project may be able to raise funds from our contacts in Philanthropic organisations. Funds up to €500,000 are available on a low-interest loan basis.

Community Share-holding Platforms

Larger scale projects (greater than €500,000) can be funded through an equity platform.

For Further Information See: https://www.energyco-ops.ie/

covering 50% of the investment. The resultant energy cost savings will enable the project to pay for itself within six years.

In a joint statement the Cathaoirleach of Roscommon County Council, Councillor Paschal Fitzmaurice and the Chief Executive, Eugene Cummins said: “It is great to see the community around Polecat Springs investing in a more sustainable future that will see significant savings in energy and will contribute in a very positive way to climate change at a local level. This community initiative is an example to all and hopefully other schemes and communities will follow the example set by the Polecat Springs Group Water Scheme”.

Pat Lavin of Eco Smart, who worked with Veolia to deliver the project, said: “The principle aims of this project were to reduce the GWS’s carbon footprint, reduce energy and running costs at the plant, and set an example for other similar schemes in terms of sustainable development and operations for water treatment plants.”

Joe Higgins, Regional Director, Veolia added: “While developments similar to the one at Polecat Springs have been done at a municipal level, this is the first GWS that is using sustainable energy to power its water treatment plant operations. Veolia is delighted to have been involved in the project and we hope that more water schemes will invest in sustainable energy in the future.”

The Group Water Schemes’ Programme was introduced in 1962 to provide grant aid to rural communities for the construction of water distribution systems from local water sources. Communities set up voluntary co-operative structures known as Group Water Schemes to privately manage these water systems, with operating costs funded through contributions from Group members and Central Government subsidies.