

EMelecSolar

Project Name: 12/10/2020

Client: Dillane Household

Phone:

Address: Carrickmacross, A81 K851

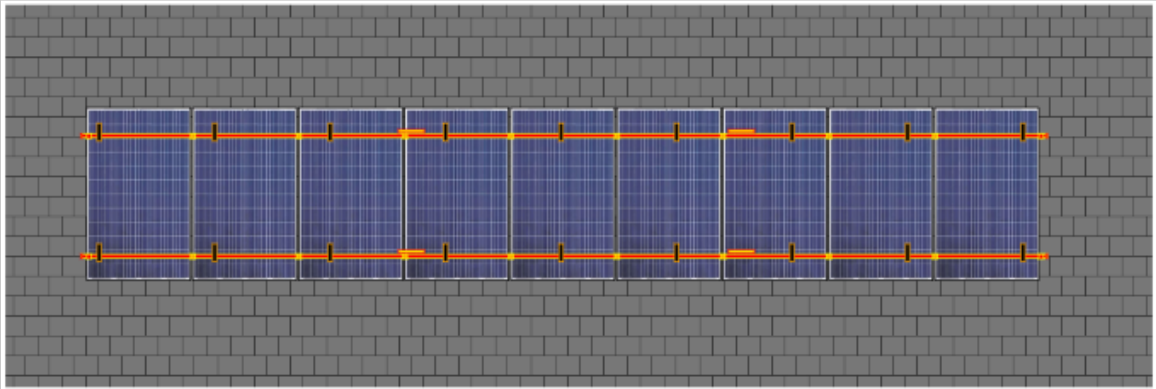
Date Created: 16th August 2019

Designer: Eamon Dillane




















Roof Layout

Roof 1



Component list

Item	Quantity
 Trina Honey 275W Poly solar panel	9
 Solis 5.0kW Hybrid Inverter inverter	1
 Emlite ECA2 extended cover	1
 Set of PV warning labels / stickers	1
 Eddi Immersion Controller	1
 Harvi Wireless CT Clamp	1
 Projoy 4 Pole Fire Safety Switch PEFS-EL16-4	1
 KN 25A 3-pole AC Isolator	2
 KG20-4 DC isolator	1
 Pair of MC4 connectors	2
 50m reel of 4mm2 solar cable	1
 Fastensol end clamp (35mm silver)	4
 Fastensol mid clamp (35mm silver)	16
 Fastensol end cap (silver)	4
 Fastensol portrait flat tile roof hook	18
 Fastensol rail splice	4
 FS Silver rail 3.15m	6

Quotation



Dillane Household
Carrickmacross
A81 K851

16th August 2019

Quotation

Ref:

Please find below your quote for the installation of a solar PV system.

Equipment costs

9x Trina Honey 275W Poly solar panel	€1,248.75
Solis 5.0kW Hybrid Inverter inverter	€0.00
Emlite ECA2 extended cover	€42.56
Safety label sheet	€4.50
1x Eddi Immersion Controller	€658.13
1x Harvi Wireless CT Clamp	€91.88
Projoy 4 Pole Fire Safety Switch PEFS-EL16-4	€309.38
2x KN 25A 3-pole AC Isolator	€78.75
KG20-4 DC isolator	€41.06
2x Pair of MC4 connectors	€9.00
50m reel of 4mm ² solar cable	€53.06
4x Fastensol end clamp (35mm silver)	€6.75
16x Fastensol mid clamp (35mm silver)	€27.00
4x Fastensol end cap (silver)	€9.00
18x Fastensol portrait slate roof hook	€148.50
4x Fastensol rail splice	€17.85
6x FS Silver rail 3.15m	€157.50
Total equipment cost	€2,903.66

Labour costs

Total labour and overheads	€0.00
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Total before tax	€2,903.66
VAT at 13.5%	€391.99
Total including tax	€3,295.66

Inverter Compatibility

Solis 5.0kW Hybrid Inverter

Panels		Inverter	
PV power:	2475 W	Rated AC output	5000 W

Input 1: 9 Trina Honey 275W Poly solar panels in 1 strings

Panels		Inverter	
PV power:	2475 W		
Open circuit voltage at -10° C	383 V	Max DC voltage	600 V
V _{mpp} at 40° C:	267 V	V _{mpp} lower limit	90 V
V _{mpp} at -10° C:	313 V	V _{mpp} upper limit	520 V
I _{mpp} at 40° C:	9 A	Max DC input current	11 A

- ✓ The open circuit voltage of the solar panels never exceeds the voltage limit of the inverter.
- ✓ The maximum power point voltage of the solar panels is always above the lower limit of the inverter MPPT tracker.
- ✓ The maximum power point voltage of the solar panels is always below the upper limit of the inverter MPPT tracker.
- ✓ The maximum power point current of the solar panels is always below the maximum current for the inverter MPPT tracker.

Input 2: No panels

Electrical

Solis 5.0kW Hybrid Inverter

AC isolator

A KN 25A 3-pole AC Isolator has been specified for this inverter

- ✓ The rated isolator current (25A) is greater than the rated inverter current (21.7A)
- ✓ The isolator is suitable for use on a single phase inverter.

Input 1

DC isolator

- ✓ This inverter contains an integrated DC Isolator.

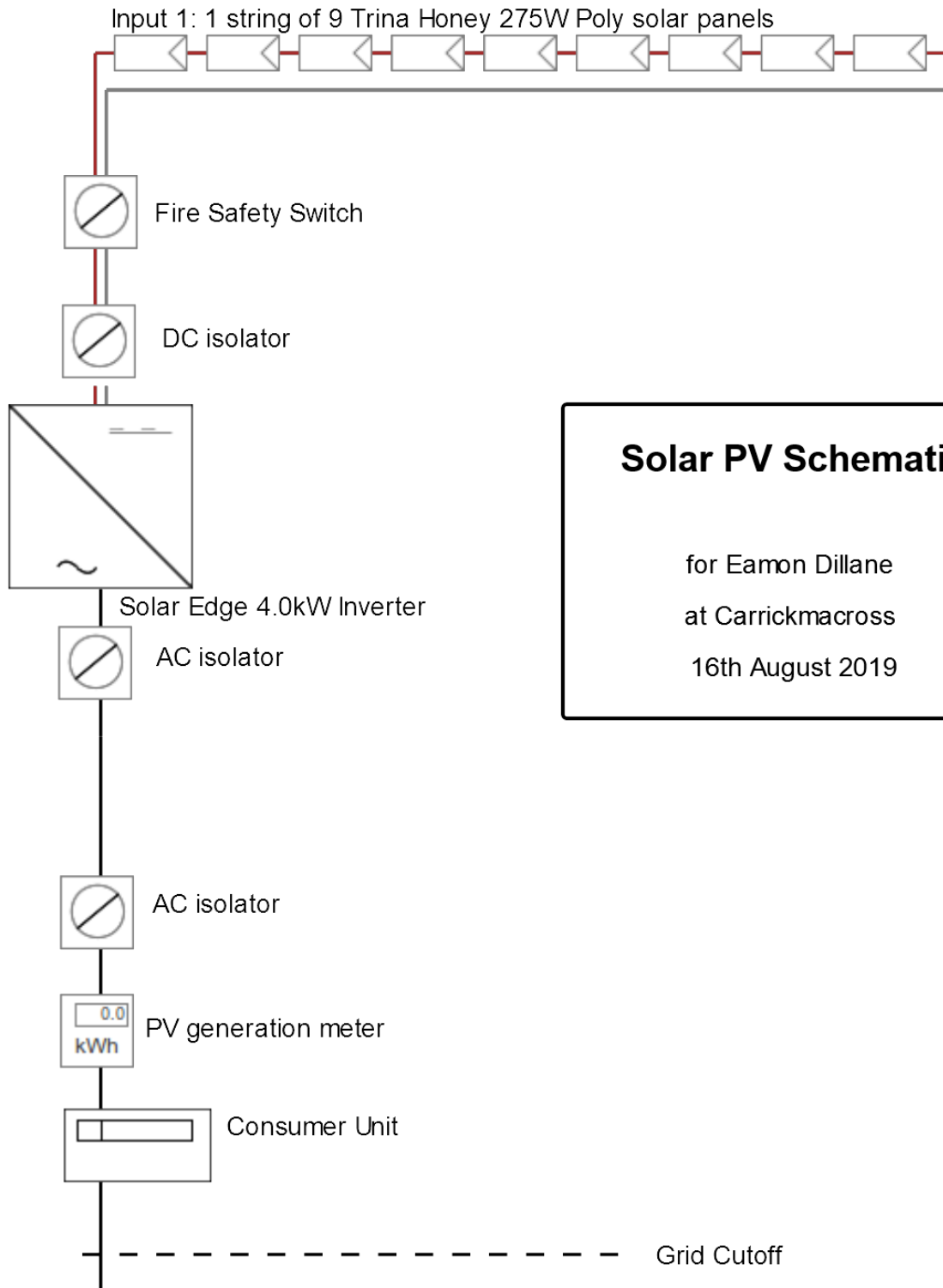
Cable

10m of 4mm² solar cable has been specified

- ✓ Voltage drop at maximum power point at 40°C will be around **0.77 V (0.29 percent)**

Input 2: No panels

Schematic diagram



Solar PV Schematic

for Eamon Dillane
at Carrickmacross
16th August 2019

Annual Output Performance Estimate

Site Details

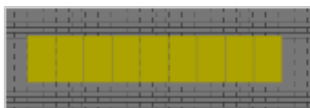
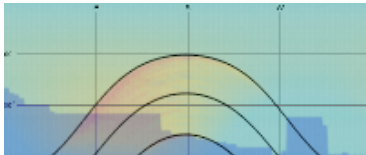
Client	Dillane Household
Address	Carrickmacross A81 K851
Postcode zone	Zone undefined

The sunpath diagram shows the arcs of the sky that the sun passes through at different times of the day and year as yellow blocks. The shaded area indicates the horizon as seen from the location of the solar array. Where objects on the horizon are within 10m of the array, an added semi-circle is drawn to represent the increased shading. Blocks of the sky that are shaded by objects on the horizon are coloured red, and a shading factor is calculated from the number of red blocks.

The performance of the solar array is calculated by multiplying the size of the array (kWp) by the shading factor (sf) and a site correction factor (kk), taken from tables which take account of the geographical location, orientation and inclination of the array.

Inverter 1: Solis 5.0kW Hybrid Inverter

Input 1



A: Installation data

Installed capacity	2.475 kWp
Orientation	-65°
Inclination	37°

B: Calculations

kWh/kWp (kk)	718
Shade factor (sf)	0.76
Estimated output	1351 kWh

Input 2: No panels

Total output over all inverter inputs: 1351 kWh

Financial projections

The expected system cost including VAT is €3,750. If grants of total €1,400 are used to pay a proportion of the installation costs, the capital required will be €2,350.

The system is expected to generate 746 kWh per year initially, decreasing gradually as the solar cells degrade. It is anticipated that all of the generated power will be consumed in the property. Over the 20 year term of this financial projection the total energy generated is expected to be 14,197 kWh.

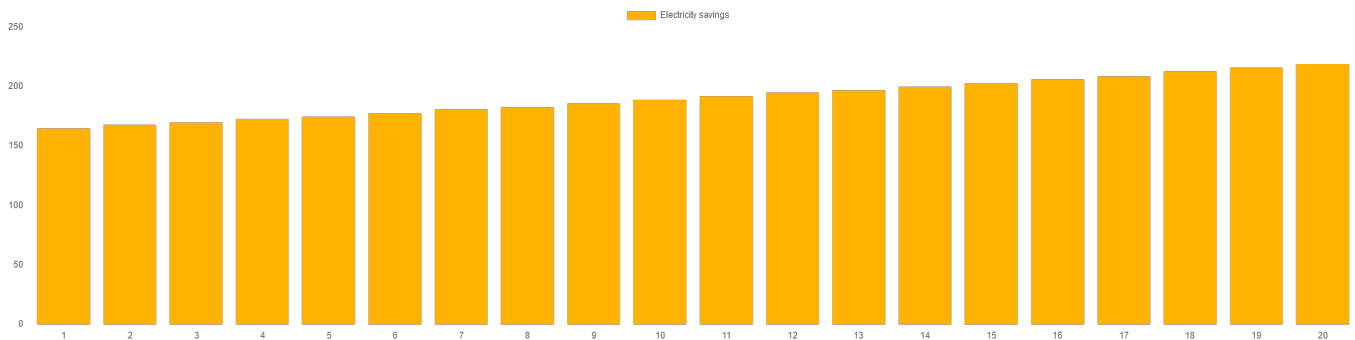
After adjusting projected costs and benefits for inflation where appropriate, and applying a discount rate of 4%, the upfront capital requirement of €2,350 is expected to be recouped after 18 years.

Income and savings

The projected income from the system over the project lifetime in payments for generated and exported electricity, along with electricity savings, are shown below.

These figures assume an inflation rate of 2 percent.

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Electricity savings	165	168	170	173	175	178	181	183	186	189	192	195	197	200	203	206	209	213	216	219
Total benefit	165	168	170	173	175	178	181	183	186	189	192	195	197	200	203	206	209	213	216	219



Bottom line

Net Present Value

The total present value of future benefits and costs, using a discount rate of 4% per year, is €3,959. The cost of the PV system is €3,750, of which €1,400 is expected to be raised by grants, so the initial capital outlay required is €2,350. The net present value of the project is therefore €209. A positive net present value is a good indication that the project is financially worthwhile.

Internal Rate of Return

The projected internal rate of return is 4.9%.

Payback Period

The table and graph below show the discounted costs for the project (including the initial capital required for the installation), against the total discounted benefits from income and savings on electricity bills. The cumulative discounted benefits become higher than the cumulative discounted costs after approximately 18 years.

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Discounted benefits		162	158	154	150	146	142	139	135	132	128	125	122	119	116	113	110	107	104	101	99	
Cumulative benefits		162	320	474	624	770	912	1.1k	1.2k	1.3k	1.4k	1.6k	1.7k	1.8k	1.9k	2.0k	2.1k	2.3k	2.4k	2.5k	2.6k	
Discounted costs	2.4k																					
Cumulative costs	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	2.4k	
Cashflow		-2.4k	-2.2k	-2.0k	-1.9k	-1.7k	-1.6k	-1.4k	-1.3k	-1.2k	-1.0k	-905	-780	-658	-540	-424	-311	-202	-95	9	111	209

