Accelerating the installation of solar PV and battery storage in East Preston

6th March 2024

Alex Templeton

07814 477378 | alex.templeton@communityinfrastructure.co.uk

What is stopping us?

A range of barriers prevent rapid adoption.

These include:

1) Cost
2) Slow rates of return on investment
3) Lack of understanding of technologies
4) Distrust of suppliers
5) A lack of data and information.

Community Energy Service Companies (ESCos): Their purpose

Aim: To make it as simple and easy as possible for anyone - household or organisation - to adopt renewable energy and battery storage

Key roles

1) To aggregate household and business projects in communities to achieve economies of scale and reduce finance costs

2) To offer household sand businesses a ‘Pay as you use’ option

How this works

1. Conduct a geospatial survey of the area to identify potential energy projects
2. Build a list of those interested
3. Use this list to raise finance for project development
4. Conduct detailed feasibility study (including non-contractual expressions of interest from households)
5. Procurement, installation, commissioning, and operation
6. At this point:
    a) Households that want buy the PV array purchase it
    b) Households that cannot afford or do not want to purchase the PV array enter into a ‘Pay as you Use’ agreement
7. Scope for additional households to join later

What will this mean?

If you buy the PV:

- Reduced carbon emissions (0.19 kg CO2e per kWh)
- Reduced cost of electricity (10-25% from the energy generated from the array)
- 7-15 years to pay for itself (working life: 30+ years)

'Pay as you use' option

- Reduced carbon emissions
- Reduced cost of electricity (10-25% from the energy generated from the array, assumes using a 'Time of Use' Tariff such as Economy 7)
- Regular options to buy the PV at residual value

What have we done so far?

1. Conducted a geospatial survey of East Preston

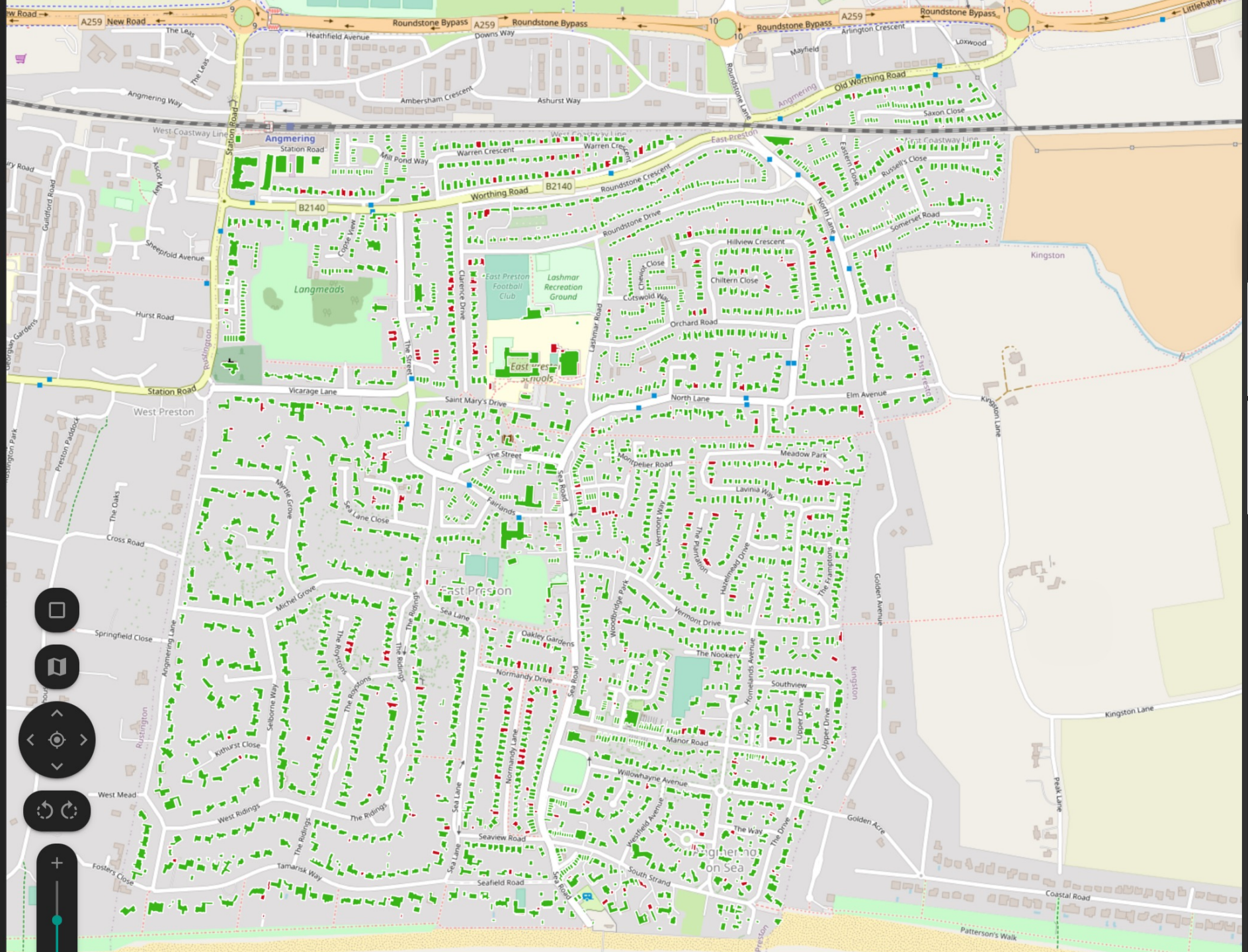
Total buildings: 2,548 (523 unsuitable)

Potential power generation 10.55 MW

2. Secured support of West Sussex County Council

The next five slides show:

1) A high level view of East Preston showing buildings assessed by the survey
2) A closer view of a cluster of buildings
3) Detailed data on an individual building
4) A list of the categories of data that the geospatial survey analyses and produces for each building
5) The LOCATE platform can analyse land parcels as well, but this is not the focus of today's discussion



Info

Click on an item in the map to view its info

Layers

Angmering Rooftop Solar PV

Sampled

100

East Preston Rooftop Solar ...

Sampled

100

East Preston Rooftop Solar PV

View Mode: Default

Show: ID, Fid Build, F...

Attributes

Ghi Min	Solar Area	Panel	System Siz	System Cst	Yield
379.77	41.14	25	6	9375	7035.65

Angmering & East Preston Rooft...

Info

ID

2254

Fid Build

osgb1000002278303

Layers

Angmering Rooftop Solar PV

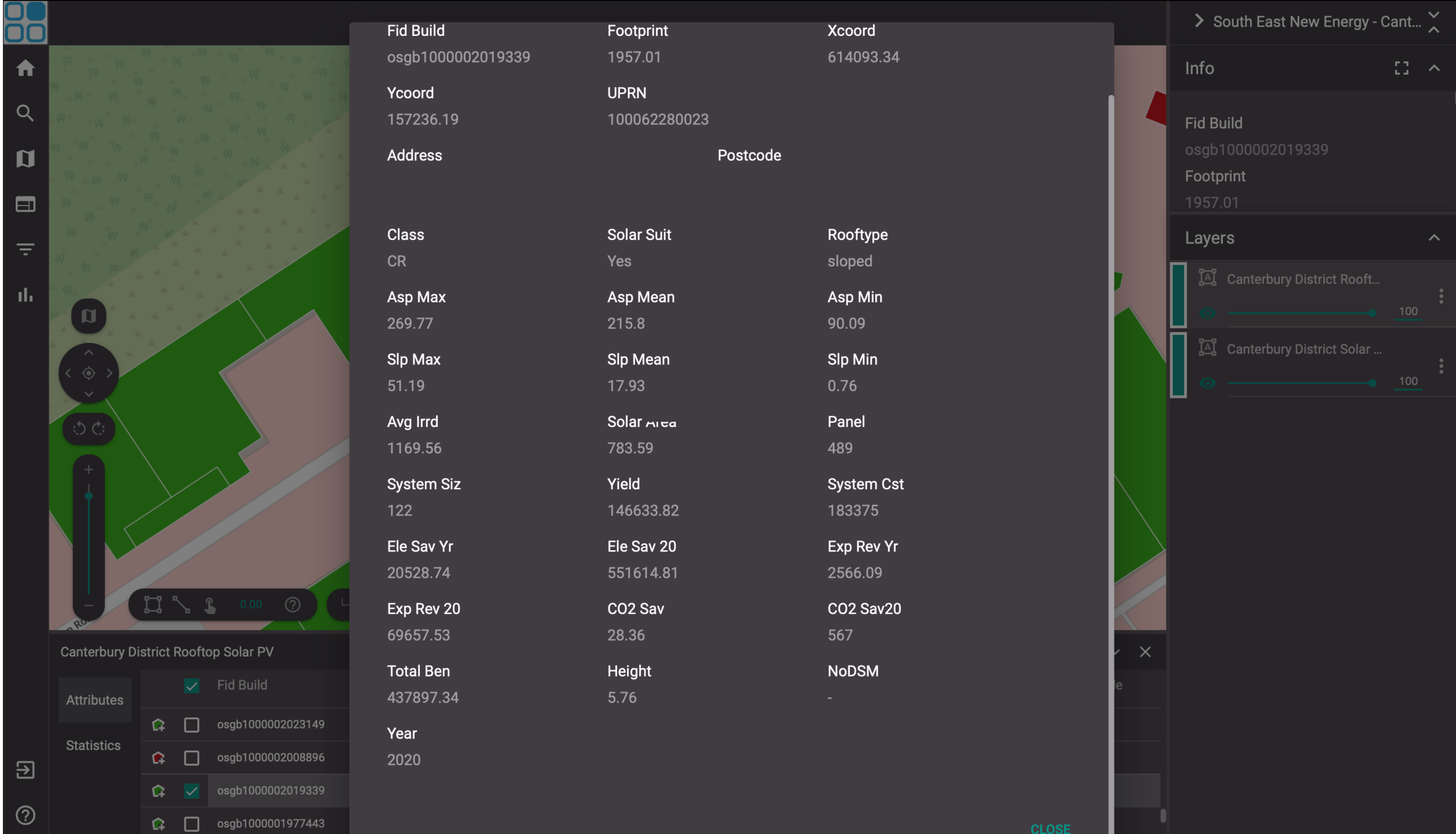
Sampled

100

East Preston Rooftop Solar ...

Sampled

100

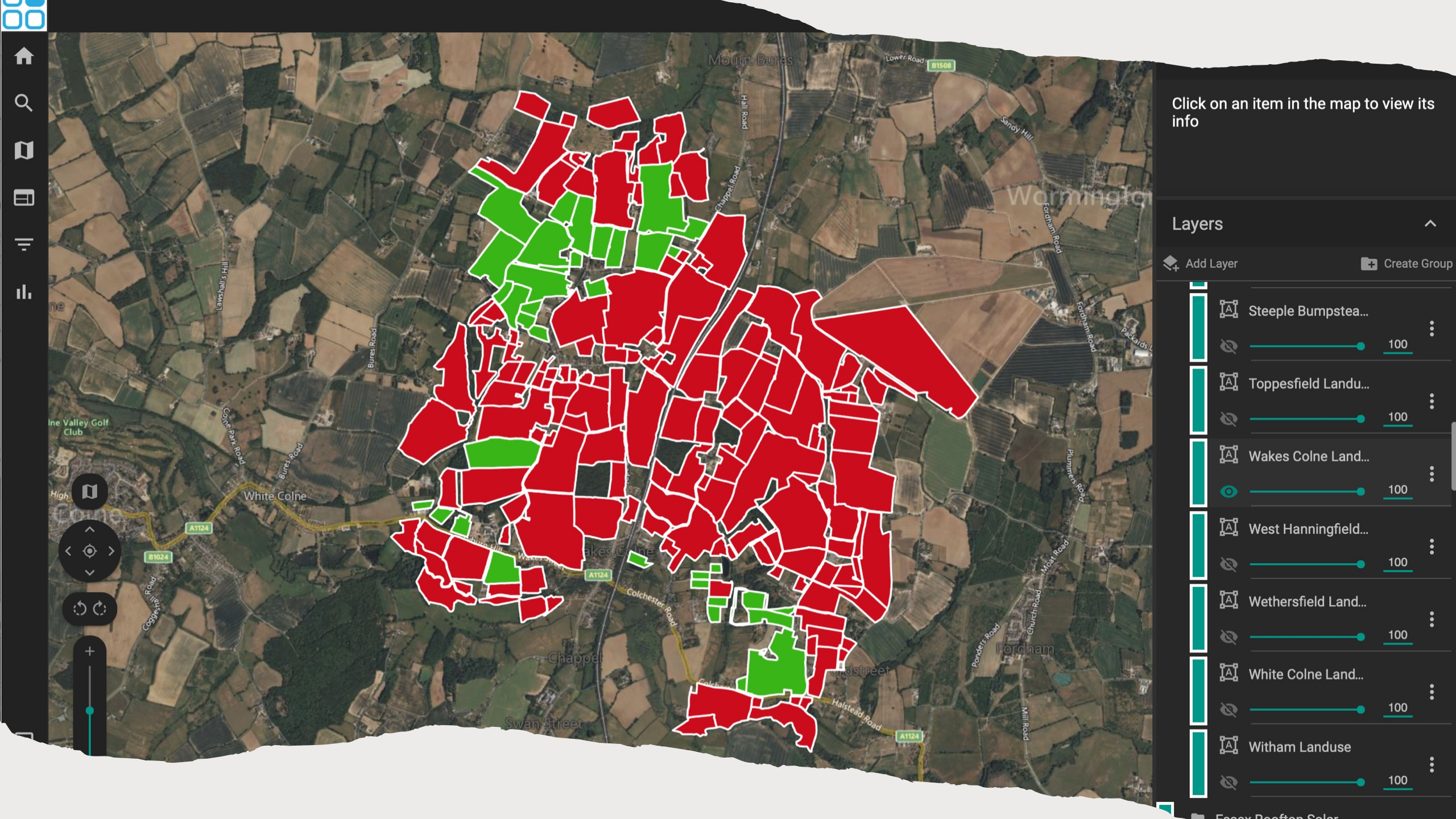

Fid Build
osgb1000002019339
Footprint
1957.01
Xcoord
614093.34
Ycoord
157236.19
UPRN
100062280023
Address
Postcode
Class
CR
Solar Suit
Yes
Rooftype
sloped
Asp Max
269.77
Asp Mean
215.8
Asp Min
90.09
Slp Max
51.19
Slp Mean
17.93
Slp Min
0.76
Avg Irrd
1169.56
Solar Area
783.59
Panel
489
System Siz
122
Yield
146633.82
System Cst
183375
Ele Sav Yr
20528.74
Ele Sav 20
551614.81
Exp Rev Yr
2566.09
Exp Rev 20
69657.53
CO2 Sav
28.36
CO2 Sav20
567
Total Ben
437897.34
Height
5.76
NoDSM
-
Year
2020
CLOSE
South East New Energy - Cant...
Info
Fid Build
osgb1000002019339
Footprint
1957.01
Layers
Canterbury District Rooft...
100
Canterbury District Solar ...
100
Canterbury District Rooftop Solar PV
Attributes
Statistics
Fid Build
osgb1000002023149
osgb1000002008896
osgb1000002019339
osgb1000001977443

Attribute Name	Description
FID_Build	– Unique Roof Identifier
X COORD	– Geographical Position in OSGB projection coordinate
Y COORD	– Geographical Position in OSGB projection coordinate
Address	– Address as provided by Ordnance Survey
Postcode	– Postcode as provided by Ordnance Survey
Class	– Building class as provided by Ordnance Survey
ROOF_TYPE	– Type of roof on a building, defined as either Sloped or Flat
SOLAR_SUIT	– Is the roof suitable for a solar installation? If not, this field is left blank
Asp_mean	– Mean direction of the roof aspect from north (0) in degrees
Asp_max	– Maximum direction of the roof aspect from north (0) in degrees
Asp_min	– Minimum direction of the roof aspect from north (0) in degrees
Slp_mean	– Mean angle of the roof slope from horizontal (0) in degrees
Slp_max	– Maximum angle of the roof slope from horizontal (0) in degrees
Slp_min	– Minimum angle of the roof slope from horizontal (0) in degrees
AVG_IRRD	– Estimated annual solar irradiation received by the building based on location and roof aspect & pitch (kWh/m2/Year)
SOLAR_AREA	– Suitable area for solar panels in square metres
PANEL	– Number of panels possible to fit to the measured roof space
SYSTEM_SIZ	– Total system size based on number of panels and individual panel output (kWp)
YIELD	– Estimated amount of productivity possible per roof(kWh) in the first year
SYSTEM_CST	– Estimated price of panel installation per property (£)
EXP_REV_1Y	– Estimated amount of income received from the electricity fed back into the grid over a one year (£)
EXP_REV_20	– Estimated amount of income received from the electricity fed back into the grid over twenty-five years (£)
ELE_SAV_1Y	– Estimated amount of money saved by using generated electricity on site over a one year (£)
ELE_SAV_20	– Estimated amount of money saved by using generated electricity on site over twenty years (£)
CO2_SAV	– Estimated amount of carbon emissions saved over a one-year period (kg/MWh)
CO2_SAV_20	– Estimated amount of carbon emissions saved over a twenty-year period (kg/MWh)
TOTAL_BEN	– Estimated amount of income received after deductions of system costs (£)
No DSM	– 'Yes' if the building requiring analysis was not contained with the LiDAR data
Year	– Indicates the year of capture of the LIDAR data used for the processing

SENE SouthEast NewEnergy

European Union
European Regional Development Fund

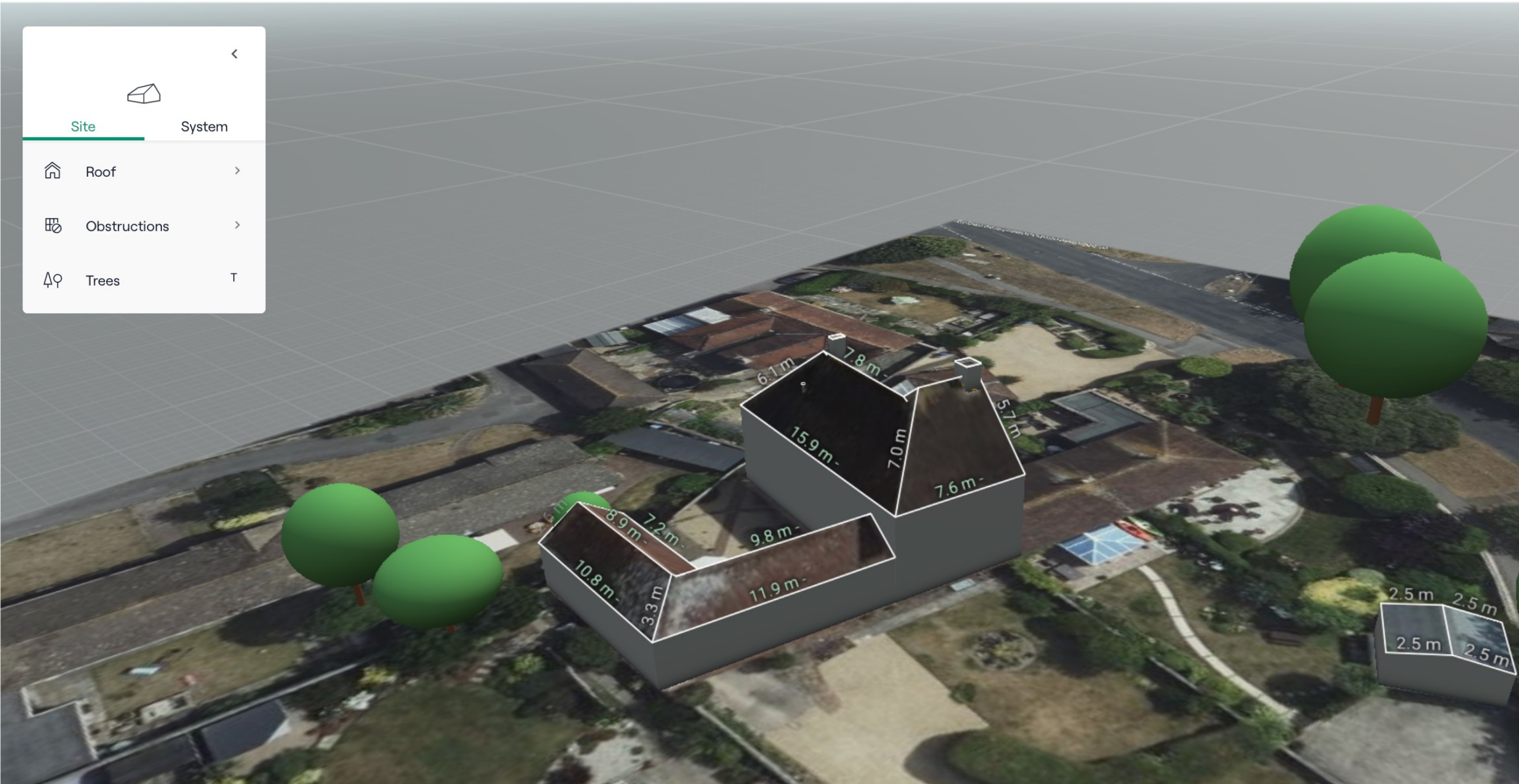
HM Government

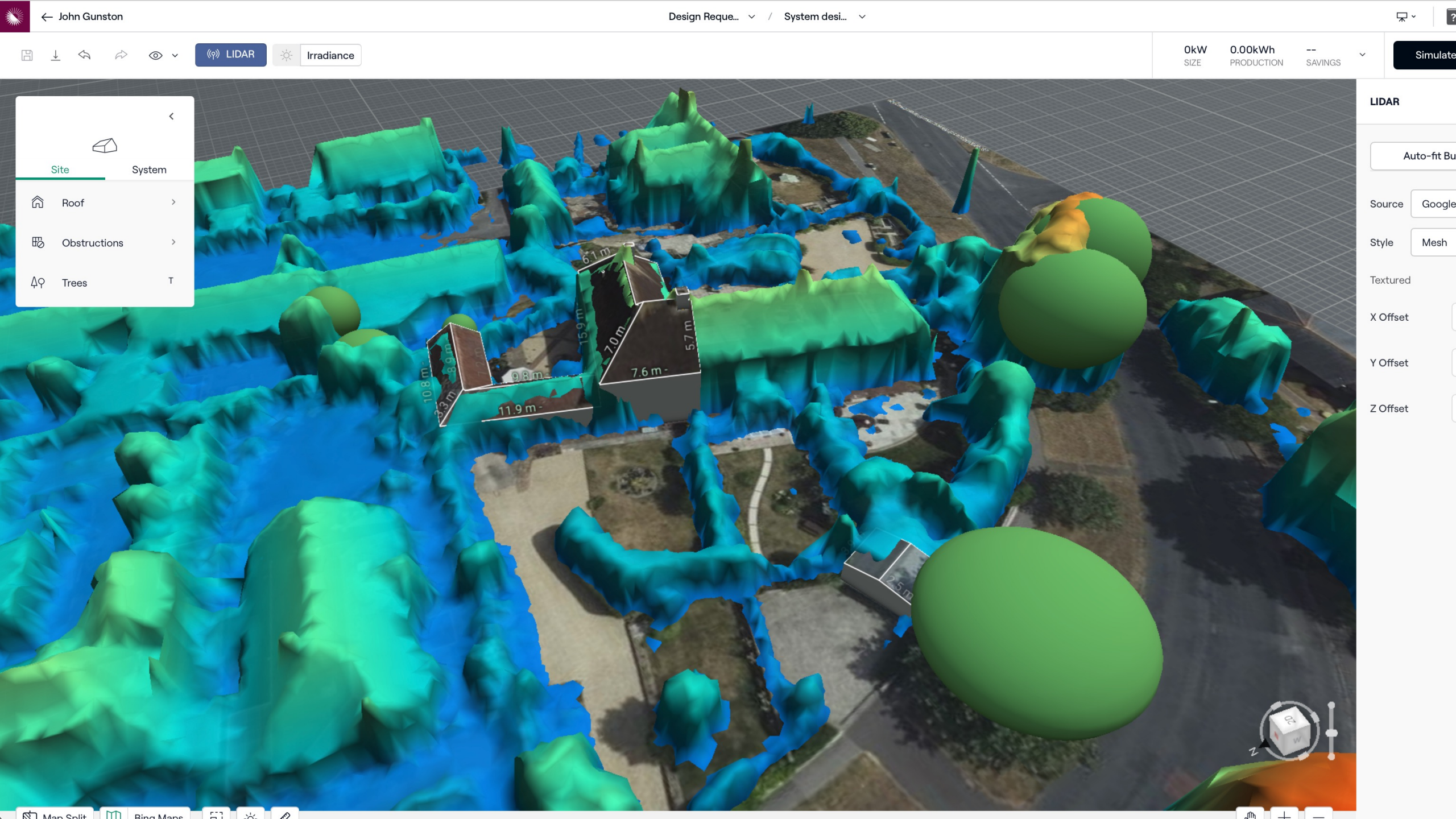

Click on an item in the map to view its info
Layers
Add Layer
Create Group
Steeple Bumpstea...
100
Toppesfield Landu...
100
Wakes Colne Land...
100
West Hanningfield...
100
Wethersfield Land...
100
White Colne Land...
100
Witham Landuse
100
Mount Bures
Lower Road
B1508
Hall Road
Chappel Road
Sandy Hill
Fordham Road
Bures Road
Lawshall's Hill
Colne Park Road
White Colne
A1124
B1024
Colchester Road
Halstead Road
Swan Street
Chappel
Fordham
Church Road
Mill Road
Ponders Road
Plummers Road
Moat Road
Packards
Coggeshall Road

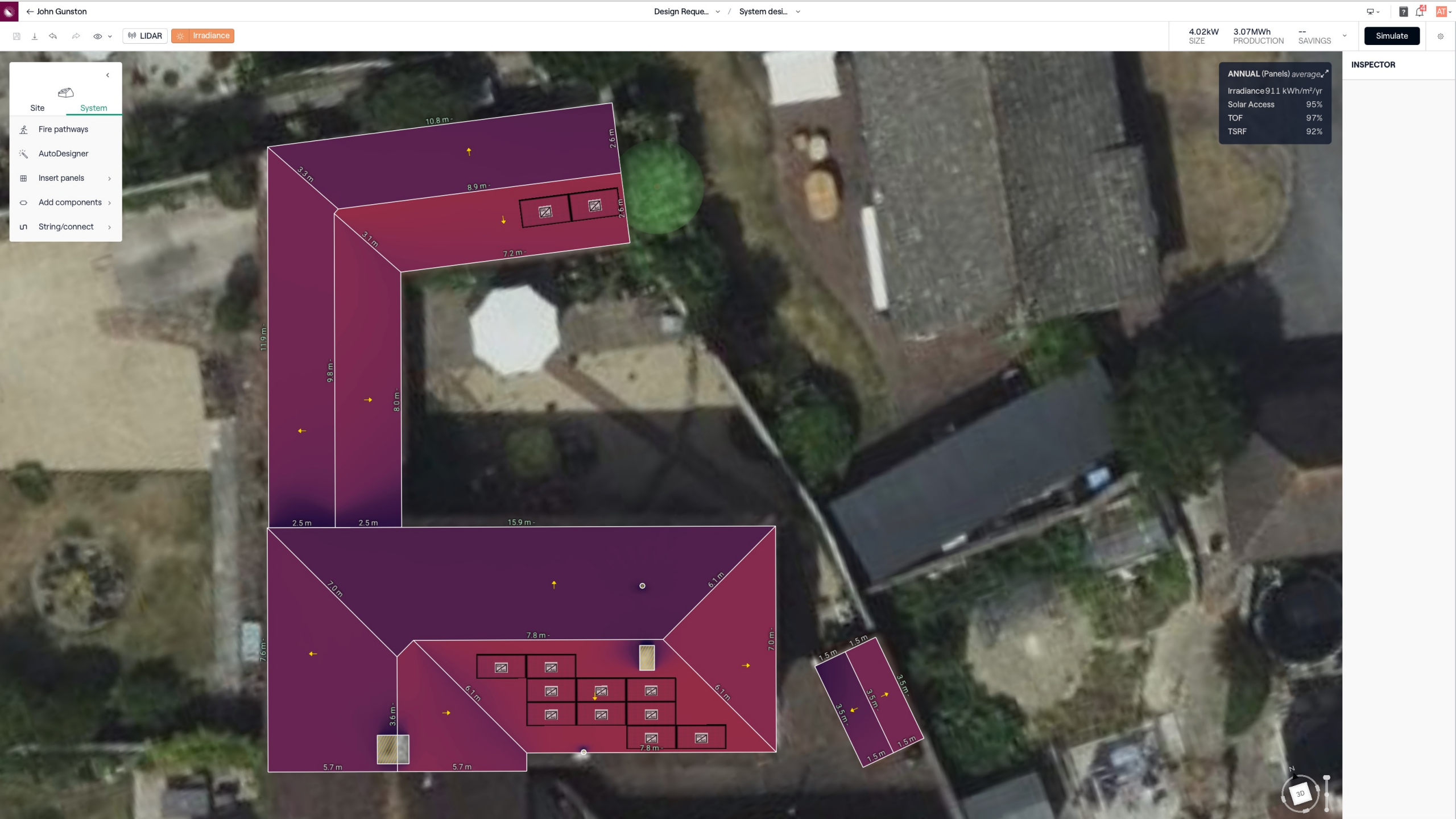
Proceeding to the next stage: detailed analysis of a building

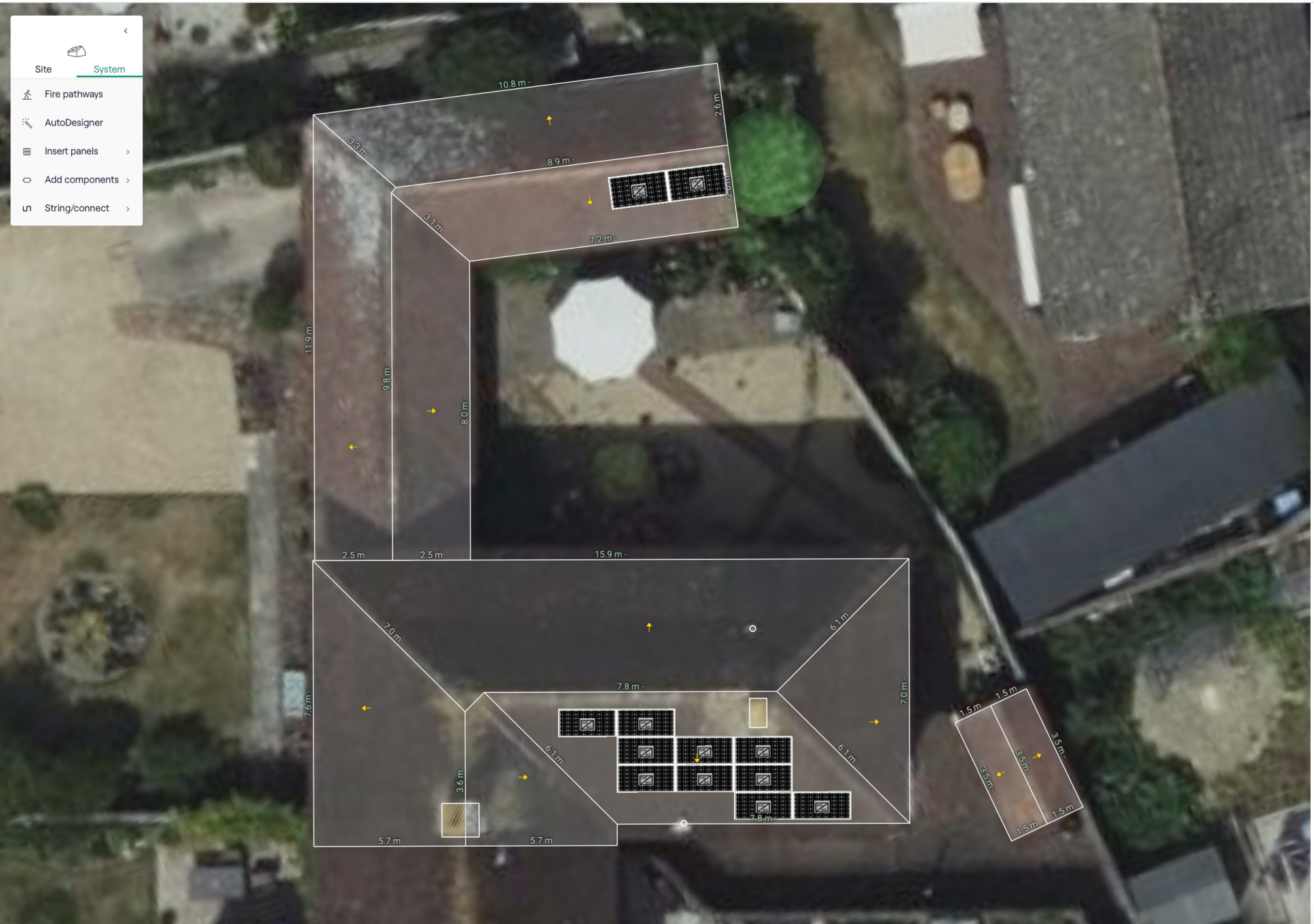
If you decide to participate, we will (as shown over the next 5 slides):

1) Model your roof
2) Assess shading from trees, and buildings
3) Asses the levels of light on the different parts of your roof
4) Come up with a design to maximise generation from your roof
5) If we have your energy bills, do a detailed calculation on the performance of the proposed system


LIDAR
Irradiance
Site
System
Roof
Obstructions
Trees
T
6.1 m
7.8 m
15.9 m
7.0 m
5.7 m
7.6 m
8.9 m
7.2 m
9.8 m
10.8 m
3.3 m
11.9 m
2.5 m
2.5 m
2.5 m
2.5 m


John Gunston
Design Reque...
System desi...
LIDAR
Irradiance
0kW
SIZE
0.00kWh
PRODUCTION
--
SAVINGS
Simulate
Site
System
Roof
Obstructions
Trees
T
LIDAR
Auto-fit Bu
Source
Google
Style
Mesh
Textured
X Offset
Y Offset
Z Offset
6.1 m
15.9 m
7.0 m
5.7 m
7.6 m
9.8 m
11.9 m
10.8 m
3.3 m
8.9 m
2.5 m
Map Split
Bing Maps


John Gunston
Design Reque...
System desi...
LIDAR
Irradiance
4.02kW
SIZE
3.07MWh
PRODUCTION
--
SAVINGS
Simulate
INSPECTOR
Site
System
Fire pathways
AutoDesigner
Insert panels
Add components
String/connect
ANNUAL (Panels) average
Irradiance 911 kWh/m²/yr
Solar Access 95%
TOF 97%
TSRF 92%
10.8 m
2.6 m
3.3 m
8.9 m
2.6 m
3.1 m
7.2 m
11.9 m
9.8 m
8.0 m
2.5 m
2.5 m
15.9 m
7.0 m
6.1 m
7.8 m
7.6 m
7.0 m
6.1 m
6.1 m
3.6 m
7.8 m
5.7 m
5.7 m
1.5 m
1.5 m
3.5 m
3.5 m
3.5 m
1.5 m
1.5 m
N
3D

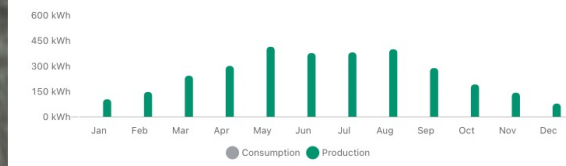


Production | Utility Bill Savings

ANNUAL PRODUCTION

12	3.07MWh	--
Panels	Energy	Energy Offset

MONTHLY PRODUCTION (KWH)



Advanced

Yield
763 kWh/kWp

Performance Ratio
0.891

SYSTEM LOSSES

Irradiance	Total kWh/m²
Irradiance	979
-2.5% Tilt	955
-0.1% Horizon	954
-5.5% Shade	901
-2.0% Soiling	883
0.0% Snow	883
-3.3% Incident Angle	854

DC	Total kWh
After PV Conversion	3,440
-0.9% Environmental	3,411
0.0% Module Rating	3,411
-1.5% Degradation	3,359
-0.5% Connections	3,343
0.0% Mismatch	3,343
-2.0% DC Wiring	3,276

AC	
-3.5% DC/AC Conversion	3,161
0.0% Inverter Clipping	3,161

Other	
0.0% Age	3,161
-3.0% System Availability	3,066
0.0% Other	3,066

Simulation Logs

4.02kW SIZE | 3.07MWh PRODUCTION | -- SAVINGS

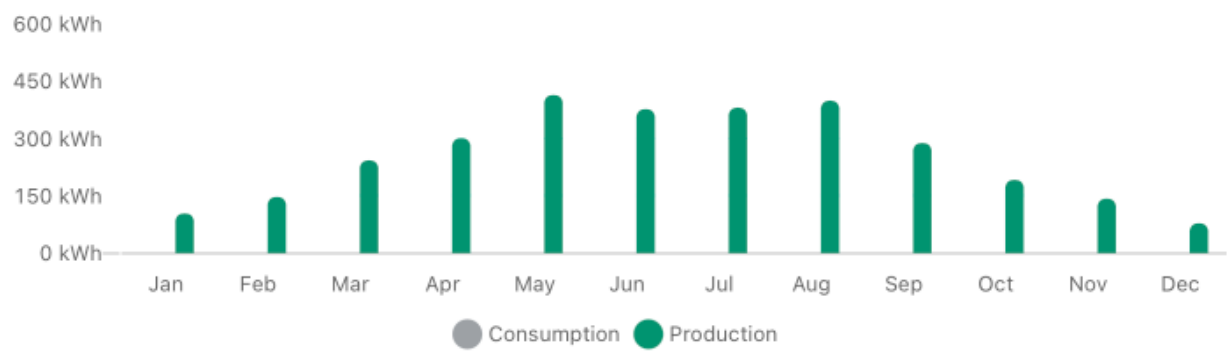
Simulate

Production | Utility Bill Savings

ANNUAL PRODUCTION

12	3.07MWh	--
Panels	Energy	Energy Offset

MONTHLY PRODUCTION (KWH)



Advanced

Yield
763 kWh/kWp

Performance Ratio
0.891

SYSTEM LOSSES

Irradiance	Total kWh/m^2
Irradiance	979
-2.5% Tilt	955
-0.1% Horizon	954
-5.5% Shade	901
-2.0% Soiling	883
0.0% Snow	883
-3.3% Incident Angle	854

DC	Total kWh
After PV Conversion	3,440
-0.9% Environmental	3,411
0.0% Module Rating	3,411
-1.5% Degradation	3,359
-0.5% Connections	3,343
0.0% Mismatch	3,343
-2.0% DC Wiring	3,276

AC	
-3.5% DC/AC Conversion	3,161
0.0% Inverter Clipping	3,161

Other	
0.0% Age	3,161
-3.0% System Availability	3,066
0.0% Other	3,066

Simulation Logs

Expressing your interest

To express an interest in participating in the East Preston Community Energy scheme, contact:

Cllr. John Gunston

cllr.john.gunston@eastpreston-pc.gov.uk

Alex Templeton

alex.templeton@communityinfrastructure.co.uk