

# Shade Impact Assessment Report

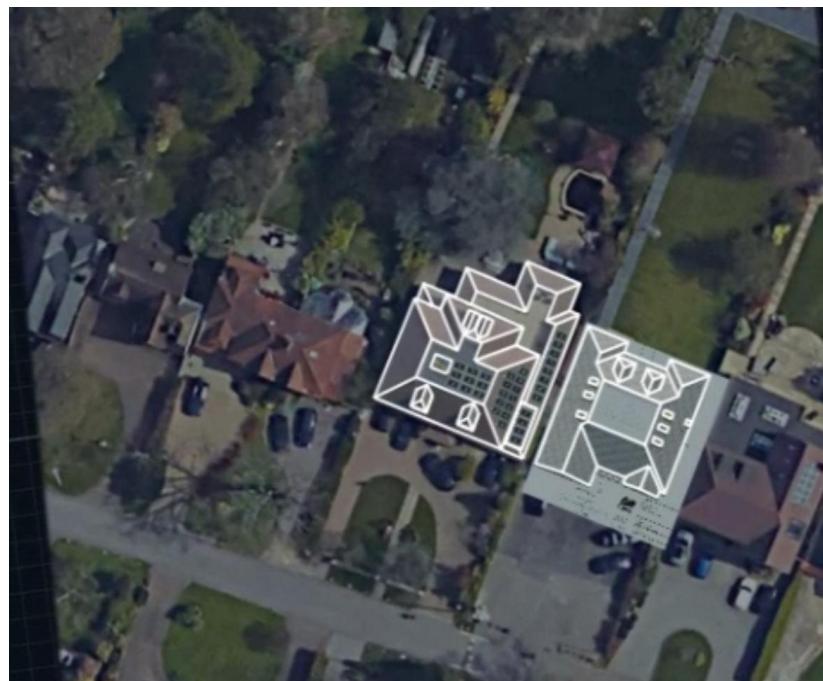
**Prepared by Elementum Ltd**

Date: July 29, 2025

Client: Mr. Vincent Bowler

Property Address: 29 The Avenue, Ickenham, Uxbridge UB10 8NR, UK.

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## RENEWABLE ENERGY SERVICES

If you are looking for expert solar energy services in the South East of England, Elementum Renewables can help. Our team is made up of highly qualified renewable energy experts with a wealth of knowledge and experience in providing a range of expert services.

You can be assured that you will receive reliable advice on your solar project every step of the way. From solar energy consultancy to installation, each staff member you speak to will be a specialist in renewable energy solutions. We are proud to provide services that you can trust.

Whatever your sustainability goals, we are always happy to discuss how we can help. Get in touch today on [01798 879947](tel:01798879947).



### COMMERCIAL

Our knowledgeable renewable energy consultancy and installation will swiftly achieve a strong ROI that supports your business and our planet.



### AGRICULTURAL

Harness the power of expert agricultural renewable systems design to help you manage your costs while protecting the environment.



### COUNTRY ESTATE

Achieve energy independence and future-proof your estate's legacy with Elementum Renewables's bespoke private estate services.



### DOMESTIC

Renewable energy systems and solar energy services for your home. Enjoy reliable energy efficiency and reduced carbon emissions.

## ABOUT US

Businesses today face increasing pressure to meet Environmental, Social, and Governance (ESG) criteria, balancing profitability with sustainability, ethical practices, and regulatory compliance.

Elementum provides renewable and solar energy solutions that address these challenges. Our areas of expertise cover BESS, G100 export limitation, heat pumps, wind, hydro, hydrogen fuel cell generation and more. Read about our founder and key team below.



### **MICHAEL LEVENS - FOUNDER**

Michael is the visionary founder and leader of Elementum Renewables. With over 12 years of experience in the renewable energy sector, Michael has established himself as a leading expert in sustainability. Bringing together a multidisciplinary team of renewables and solar pv specialists, Michael created Elementum to excel in a broad spectrum of energy solutions, including but not limited to solar, wind and hydro.

Michael's career is marked by a relentless commitment to advancing clean energy initiatives and fostering sustainable development. He is an experienced registered gold card technician qualified in design and project management and committed to harnessing cutting-edge technologies.

### **BERNARD RIGG - PRINCIPLE CONSULTANT**

Bernard is passionate about sustainability and has worked in the field since 1988 when he became an administrator for the Nature Conservancy Council. He moved on to roles as a local authority waste regulation officer, regional manager for a clinical waste management service and as an ISO14001 lead auditor for a leading certification body.

Bernard set up his own consultancy business in 2005 offering provision of training, auditing, risk management solutions and environmental/ health and safety legislation guidance for a wide range of industry sectors. In 2022, Bernard joined Elementum to bring his expertise to the practical delivery of sustainable development solutions.

### **MATTHEW GIBBS - RESEARCH AND DEVELOPMENT TECHNICIAN**

Matthew spent the last decade in construction working with all trades, specialising in crane supervision and logistics. With expertise spanning technical operations and project supervision, he is equipped to integrate renewable energy technologies into the construction environment. Transitioning from logistics management to sustainability, Matthew now drives towards carbon-neutral construction solutions, bringing valuable expertise to the Elementum team.

With a background in music and hospitality, he brings a diverse set of skills and a passion for providing outstanding service. Committed to growth and innovation, Matthew's goal is to lead sustainable practices across multiple industries, ensuring a greener future for everyone.

### **OUR GOAL**

Elementum offers renewable and solar power solutions tailored to your needs, focusing on smoothing out your consumption profile. We will review your electrical consumption over 24-hours to understand your demand and create a bespoke solution. Our goal is to give you and our planet the best possible return on your investment.

[www.elementum-esg.co.uk](http://www.elementum-esg.co.uk)



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## 1. Executive Summary

Elementum Ltd was engaged by Mr. Vincent Bowler to assess potential shading impacts arising from a planned redevelopment at his property following one of the previous conditions for refusal sited in Application Ref No. 996/APP/2022/3649 being the absence of satisfactory information to demonstrate impact and or mitigation (**Section 2. Recommendation - Sub Section Refusal 3. NON2 “Harm to Existing Solar Panels at 27 The Avenue”**).

Our assessment follows the Buildings Research Establishment (BRE) guidance required to maintain British Standards. This analysis focuses on evaluating the potential impact on the neighbouring rooftop solar PV system, offering recommendations to mitigate and or compensate for calculated losses in generation, and preparing materials suitable for planning submission.

This report includes:

- A 3D model-based shade analysis using LiDAR and irradiance mapping.
- Monthly and annual performance degradation modelling across four arrays.
- Mitigation strategy including proposed location of supplementary panels arrays 5 & 6
- **Custom video simulation** visualising the impact of shading throughout the year.

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## 2. Site Overview and Methodology

The assessment utilised Aurora Solar’s modelling tools, which include:

- High-resolution satellite and street imagery
- Seasonal shade simulations using real-world LiDAR.
- Azimuth, tilt, and irradiation-based performance analysis
- **Time-lapse video simulation** showing dynamic shading patterns across seasons.

Coordinates:

 51.56366818742553, -0.4500604791679441

 Date of Report: July 2, 2025



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### 3. PV System Impact Analysis

As presented in the Aurora-generated report (page 1), four arrays were assessed:

Array ID	Panel Count	Azimuth	Pitch	Annual TOF	Annual Solar Access	Annual TSRF
1	12	210°	44°	96%	93%	89%
2	8	210°	25°	96%	76%	73%
3	9	0°	0°	85%	100%	85%
4	4	209°	0°	85%	85%	72%

Array 2 is the most impacted, with a reduction to 76% solar access, primarily in winter months. This impact is visualised through a combination of static irradiance maps and **animated video rendering**, which shows solar paths and obstructions across different times of day and year.

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### 4. Visual and Video Evidence

This engagement included not only traditional graphical deliverables (pages 1–4 of the Aurora PDF report), but also a **custom video simulation**, created by Elementum's spatial modelling team.

Provided Materials:

- **Annual irradiance heatmaps**
- **3D model visualisation from various angles**
- **LIDAR-based terrain and canopy mapping**
- **Custom video (MP4):**  
A dynamic, timestamped video showing solar access and shading transitions over the course of a full year. This tool provides unparalleled clarity for planning officers or legal arbitrators, particularly when static images are insufficient.

This multi-format documentation enables effective communication of complex spatial impacts to non-technical stakeholders.

## 5. Considerations

The redevelopment may marginally affect a neighbour's solar yield. However, the risk is low and manageable due to:

- **Planning diligence:** Comprehensive Shade Modelling conducted with an Annual Irradiance weighted average by panel count.
- **Limited degradation:** Impact assessment has demonstrated that only the lower-level arrays 2 & 4 are affected with array 2 impacted predominantly in the Winter Months.
- **Mitigation:** Offset to compensate for losses on the affected arrays 2 & 4 has been calculated by the addition of 4 supplementary strategically positioned panels on the remaining roof space in areas 5 & 6 with final location to be mutually agreed by number 27. Mr. Bowler proposes compensation by means of full remuneration for system upgrades, namely additional solar panel installation that will produce sufficient energy to compensate for potential losses.
- **Supplementary visual evidence:** Including the aforementioned **video simulation** to clarify and contextualise impacts.

This report and accompanying media aim to demonstrate a proactive, balanced, and reasonable approach by the client, engaging collaboratively with any potentially affected parties and aligning with national planning guidance and civil duty-of-care principles.

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## 6. Recommendations

Elementum advises:

1. **Submission of this report** and **video evidence** with planning documents
2. **A letter of goodwill** and mitigation offer to affected parties
3. Engagement with planning officers to proactively address concerns
4. Keeping all media on file for future use if required

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### Prepared by:

**Elementum Ltd**

Principal Consultant for Sustainable Energy and Planning Compliance

Email: [mike@elementum-esg.co.uk](mailto:mike@elementum-esg.co.uk)



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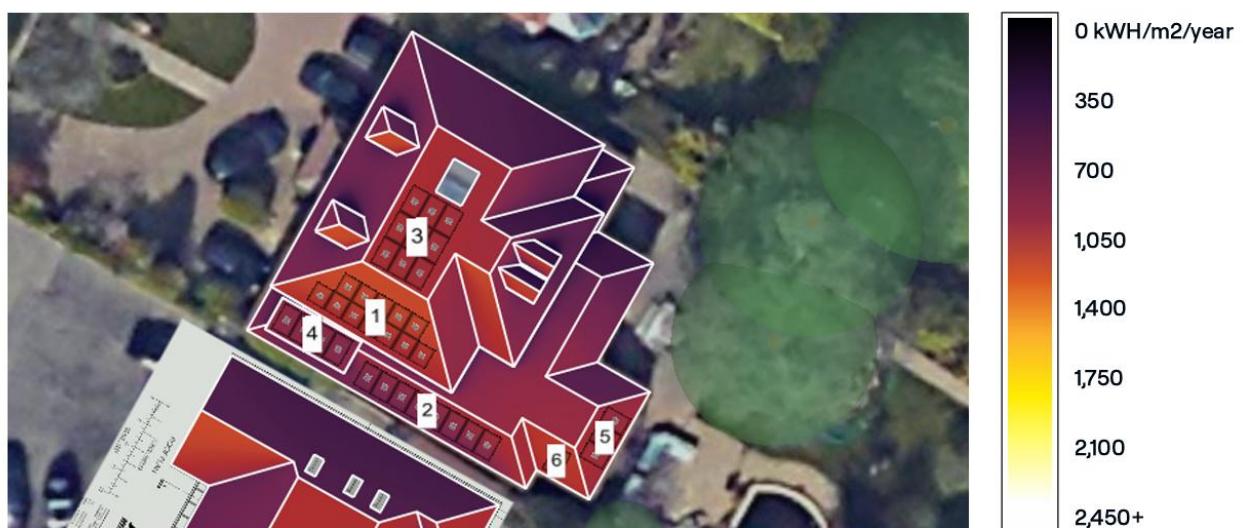
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Address: 29 The Avenue, Ickenham, Uxbridge UB10 8NR, UK  
 Coordinates: 51.56366818742553, -0.4500604791679441  
 Date: Jul 28, 2025

### Annual irradiance



### Summary

Array ID	Panel count	Azimuth	Pitch	Annual TOF	Annual solar access	Annual TSRF
1	12	210°	44°	96%	93%	89%
2	8	210°	25°	96%	74%	71%
3	9	0°	0°	85%	97%	82%
4	4	209°	0°	85%	83%	71%
5	3	120°	25°	91%	88%	80%
6	1	210°	25°	96%	91%	87%
Weighted average by panel count:				88.3%	80.7%	



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Address	Coordinates	Date
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### Monthly solar access % across arrays

Array ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	76	89	95	95	95	94	94	95	95	92	82	69
2	37	44	59	79	90	88	88	84	67	53	45	35
3	98	98	97	96	97	97	97	96	97	97	96	98
4	50	58	81	90	89	89	87	88	87	72	57	50
5	86	84	84	93	92	87	90	93	88	77	82	85
6	88	82	84	91	96	95	95	93	85	84	89	89



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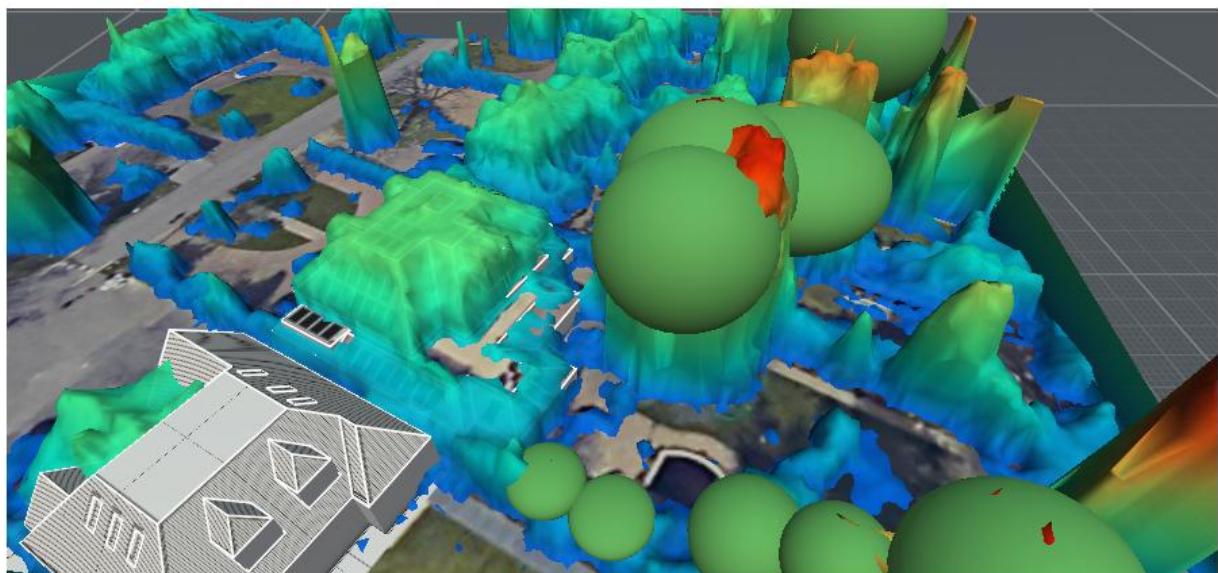
Zoomed out satellite view



3D model



3D model with LIDAR overlay



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Street view with corresponding 3D model



I, certify that I have generated this shading report to the best of my abilities, and I believe its contents to be accurate.



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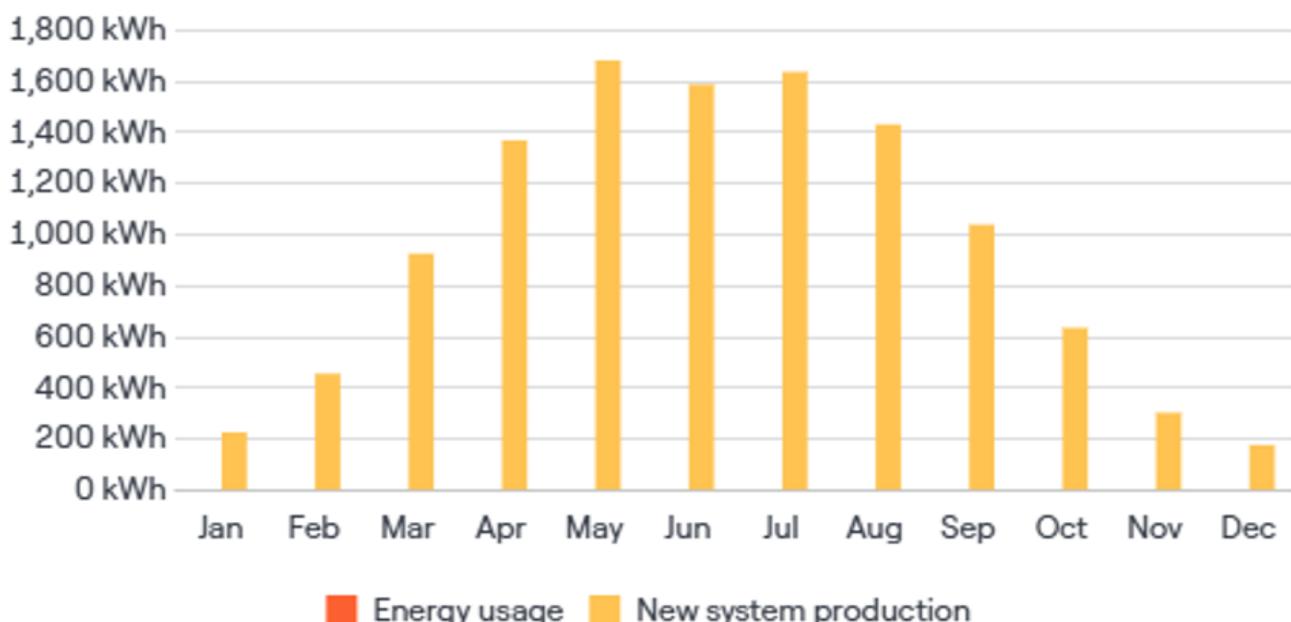
⚡ **Production**

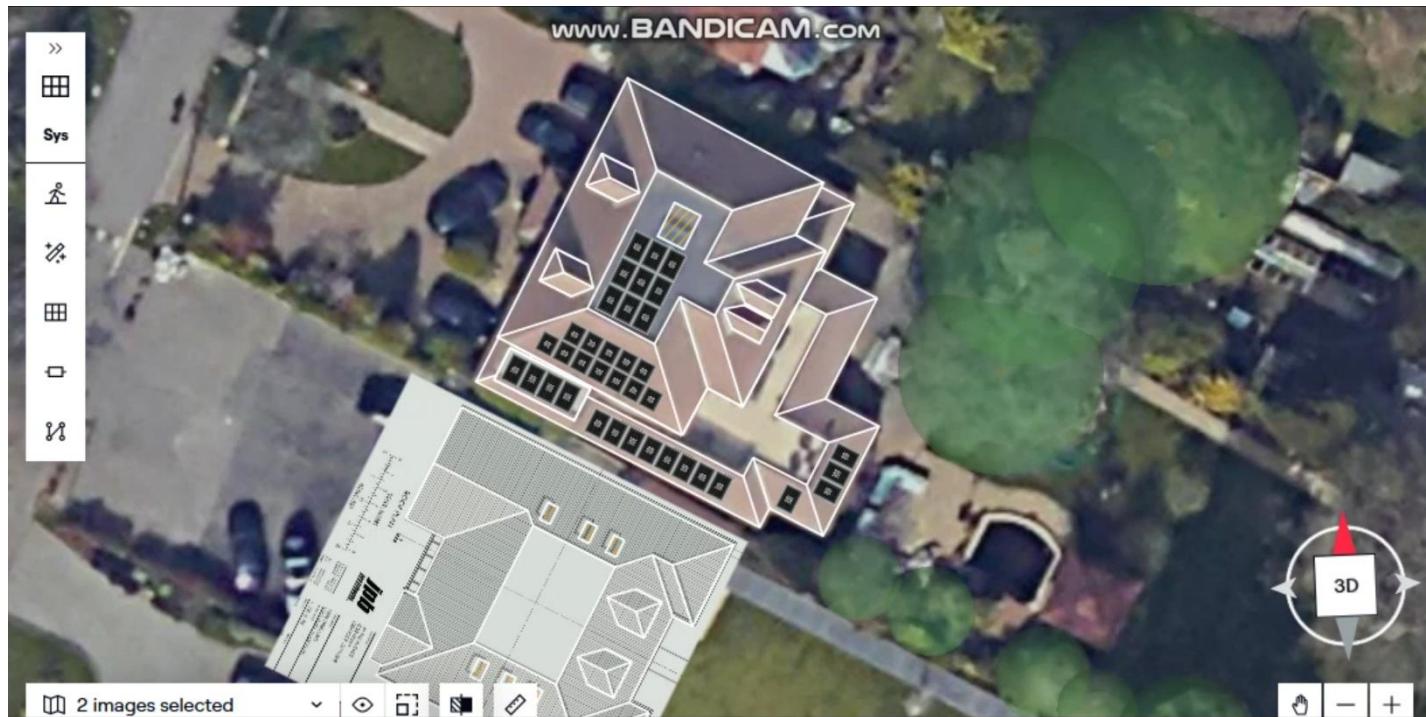
⌚ **Bill savings**

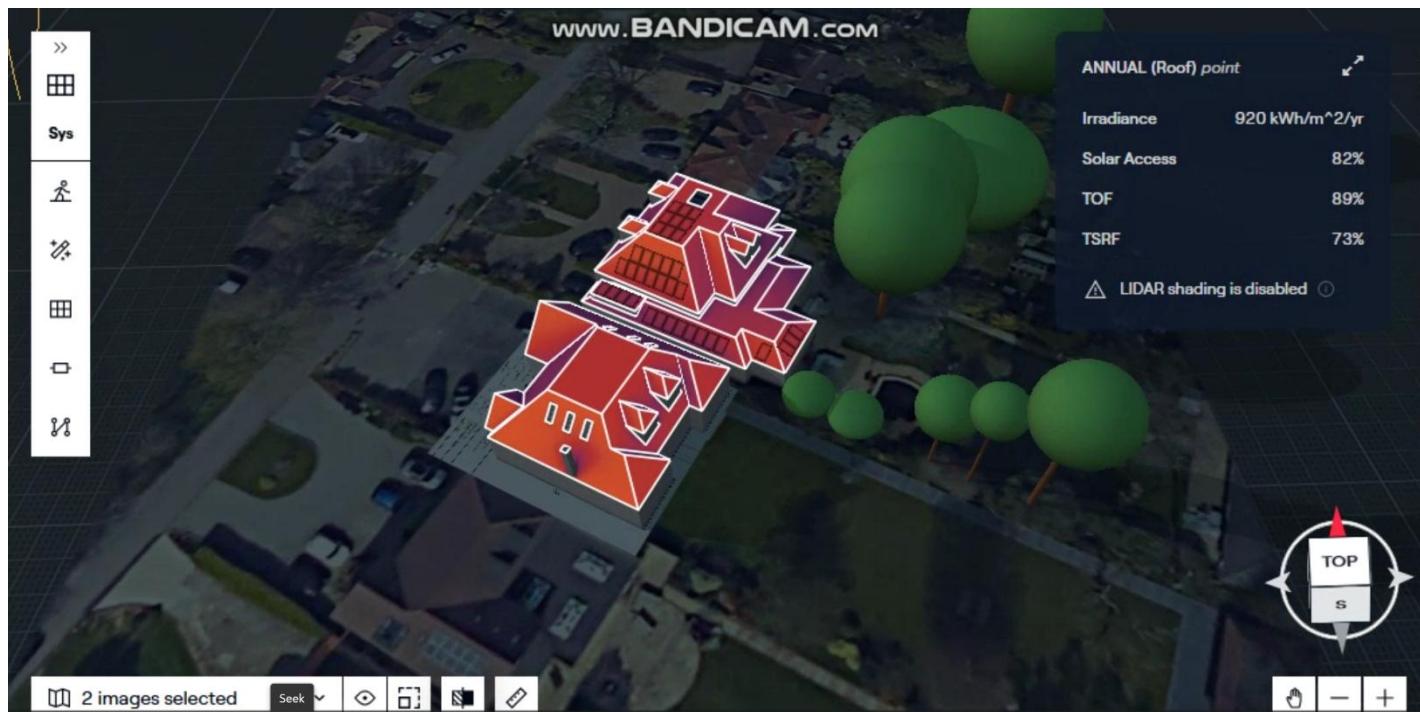
## Production

Panels	Annual energy	Energy offset
37	11,475 kWh	— %

### ▣ Monthly production (kWh)







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