



The Australian PV Institute

Dan Stevens

SunSPoT - Community Development Manager

Australian PV Institute

APVI.ORG.AU

SunSPoT



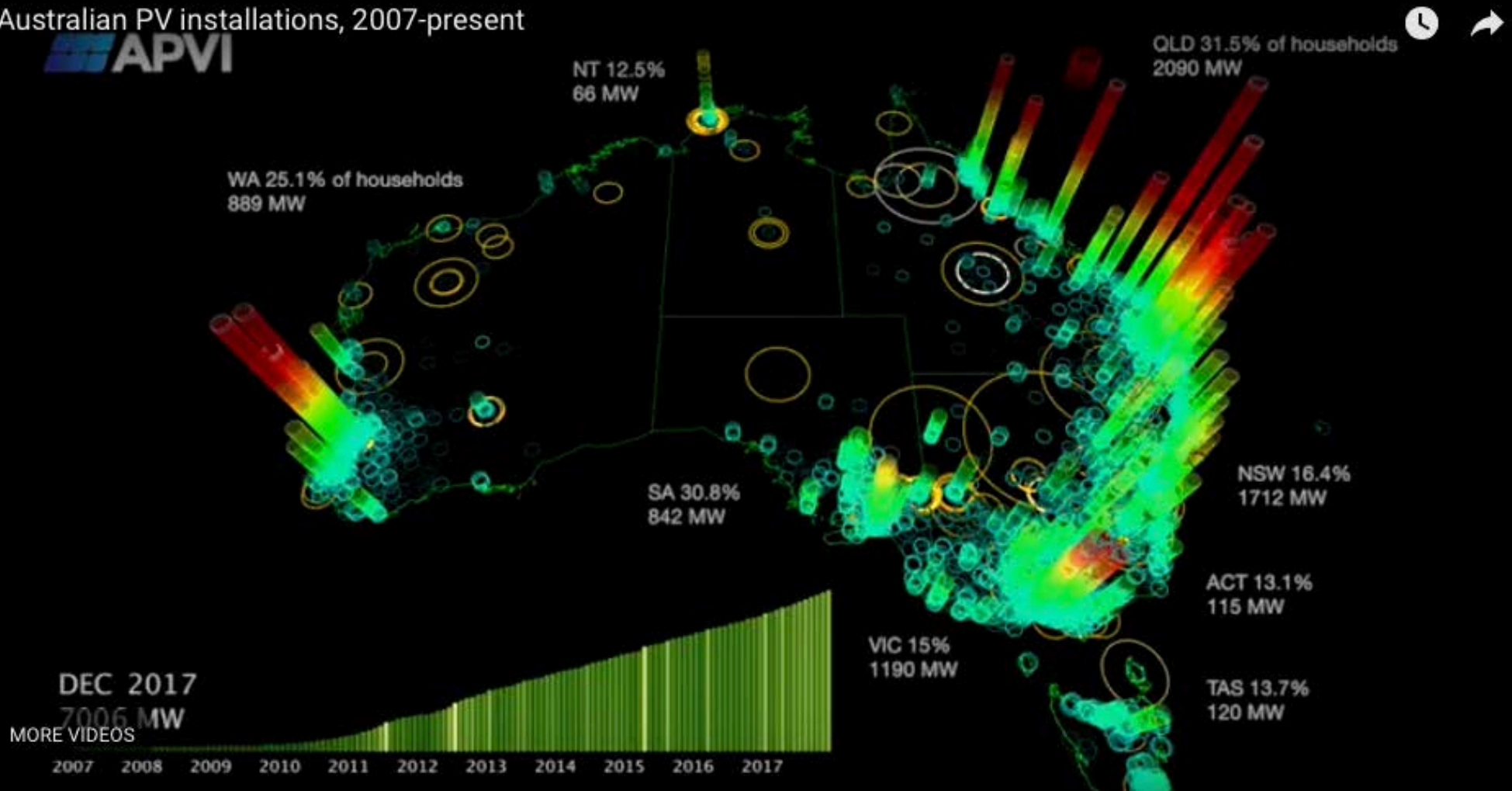
THE APVI

Objective: To support the increased development and use of Solar PV via research, analysis and information

- **Member based Non-Profit organisation:** Includes businesses, researchers, government agencies, individuals with an interest in PV
- **Independent:** APVI is apolitical, independent and widely cited by the PV sector, governments and stakeholders

International Energy Association (IEA) PVPS and SHC representation for Australia

Australian PV installations, 2007-present





SOLAR POTENTIAL TOOL

Opportunity: Solar PV is clean, distributed and low-cost, and is leading the transition to smart energy technologies, consumer engagement and new clean-energy business models

- **Problem:** There is significant potential for rooftop solar PV in Australia, but there has thus far been a **lack of good quality information to make decisions about PV investments.**
- **Solution:** The SunSPoT Tool uses solar radiation data and GIS models to provide an independent, easy to use online tool, free for end users, to identify the best roofs for solar PV. The tool measures **solar potential, accounting for PV system area, tilt, orientation and shading from nearby buildings and vegetation**

SOLAR POTENTIAL MAP

Application: SunSPoT, developed by UNSW, is an interactive tool that provides information and analysis to help energy consumers and PV business make better decisions about investment in PV, and to optimise the value of PV investments

➤ **Users for the SunSPoT Solar Potential Tool include:**

- ✓ **Councils**
- ✓ **Rate-Payers**
- ✓ **Community Groups**
- ✓ **Businesses**
- ✓ **Investors / Developers**



SunSPoT

Project support & funding from both ARENA and Smart Cities & Suburbs

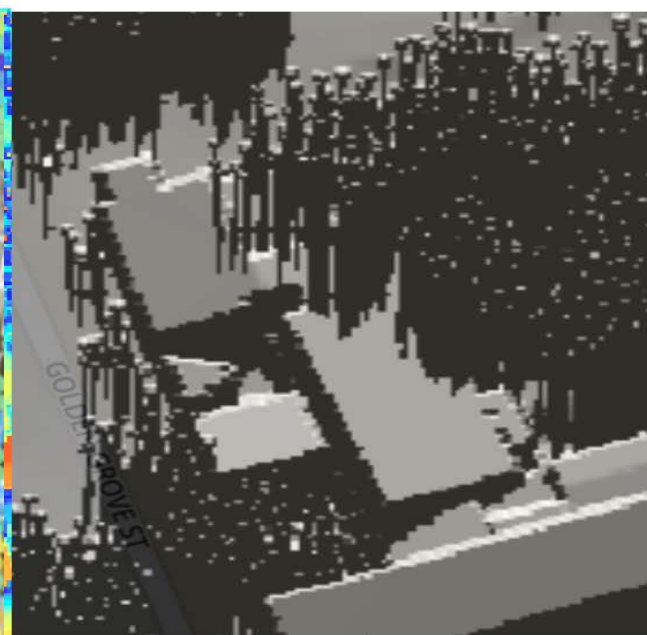
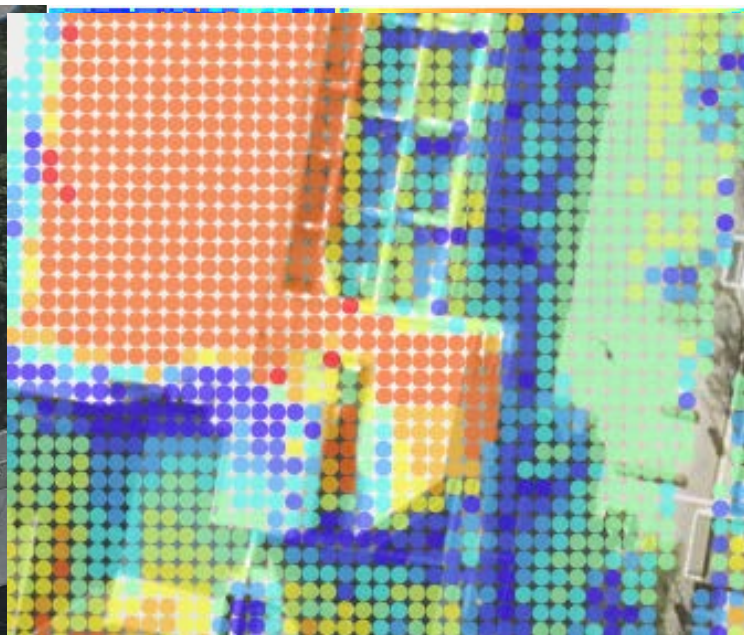


COUNCIL OPPORTUNITY

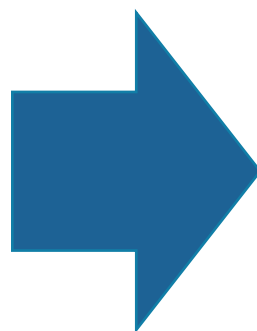
- **Councils can partner with the APVI to have their LGA's mapped to offer this unique service for their council & local members & rate-payers**
- **Initial mapping fees include the initial SunSPoT map implementation, hosting and maintenance for a three-year term**
 - ✓ **Free to End user once implemented by Council**
 - ✓ **Easy to use online tool allows for better decision making around solar PV investment**
 - ✓ **Drives Solar PV Adoption in households & businesses**
 - ✓ **Alignment with Sustainability & Social Responsibility**
 - ✓ **Helps Carbon Reduction Strategies**

COUNCIL'S LAUNCHED:

- **Australian CBD's**
- **Blacktown**
- **Canberra / ACT – Next!**
- **Inner West**
- **Northern Beaches**
- **Lane Cove**
- **Lane Cove**
- **Willoughby**
- **Kuringgai**
- **Randwick**
- **Ryde**
- **Willoughby**
- **Additional 47+ Councils in discussion**



3D building models,
XYZ vegetation points
1m ESRI Grids
Insolation Maps
GIS/LiDAR Data



surface tilt
orientation
annual and monthly levels of solar
insolation falling
on each 1m² unit of surface

Solar PV Maps and Tools

Understand the Australian solar PV market with live generation data, historical maps and animations, and tools to explore rooftop PV potential and per-postcode market penetration.

This project has been funded by the Australian Renewable Energy Agency



Australian Government
Australian Renewable Energy Agency



Live Solar PV

Live performance data from nationwide PV installations, with total electricity demand and PV contribution



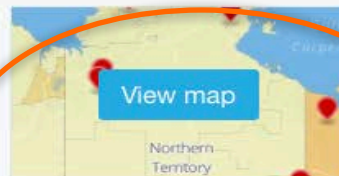
PV Performance by Climate Region

Compare and chart PV generation data from over 50 locations across Australia, and download data for offline analysis



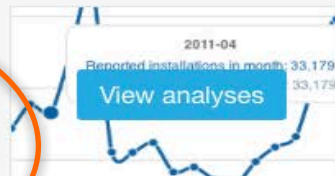
SunSPoT

Rooftop solar mapping tool using 3D data, for assessing annual and per-month PV potential in urban environments



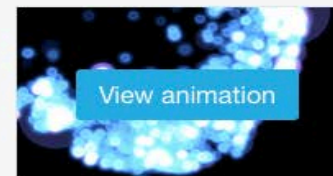
Solar PV Status

Estimated percentage of dwellings with PV systems and total installed capacity, by postcode and LGA



Market Analyses

Charting per-month PV installations registered under the Commonwealth Government's Renewable Energy Target



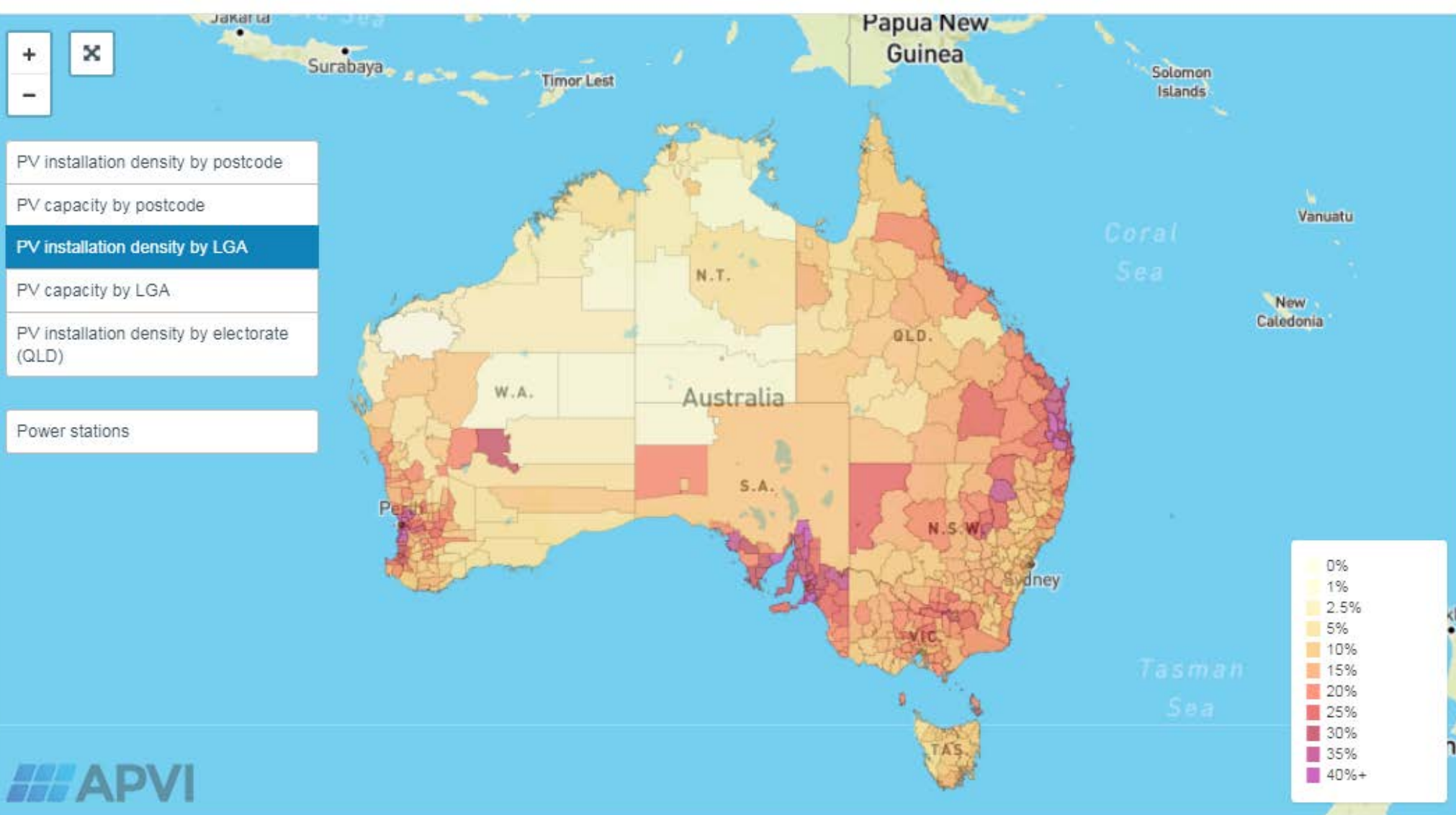
Solar Animation

Visualise per-postcode PV installations across Australia since January 2007, by average system size and PV penetration



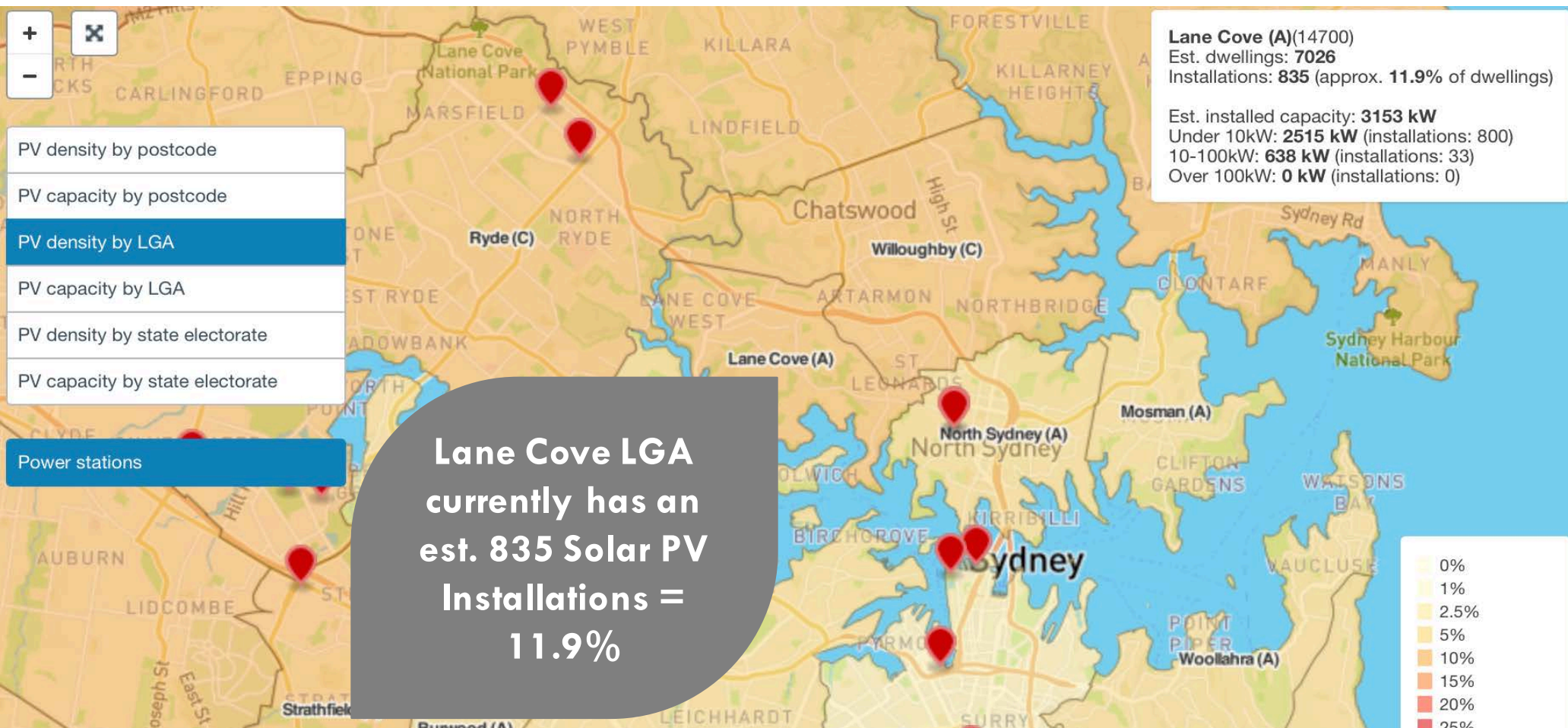
PV Postcode Data

Explore PV installations by postcode and system size, with per-month installation figures since 2007



Solar by Local Government Area

Mapping Australian Photovoltaic installations





Choose a city to use the tool

Perth

Brisbane

Adelaide

Sydney

Canberra

Melbourne

Shadow layer

Shadow layers displaying shadows at solar noon for the Equinox, Winter Solstice or Summer Solstice. These layers can be used to determine which surfaces will be impacted by shading at different times of the year.



Understand your solar potential



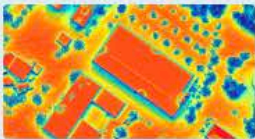
- Zoom in to locate your building
- Search for a specific address
- Switch between satellite and street maps
- Use the drawing tools to select a single roof area

The Solar Potential Tool (SunSPoT) models typical PV panels and systems that are installed in Australia. However, there are more or less efficient panels and system components available on the market. More efficient panels will produce more energy in the same area, but may be more expensive.

Data only exists on rooftops in the area covered by the insolation heat map. There is no data for ground (non-roof) areas.

Choosing the best conditions for solar PV systems

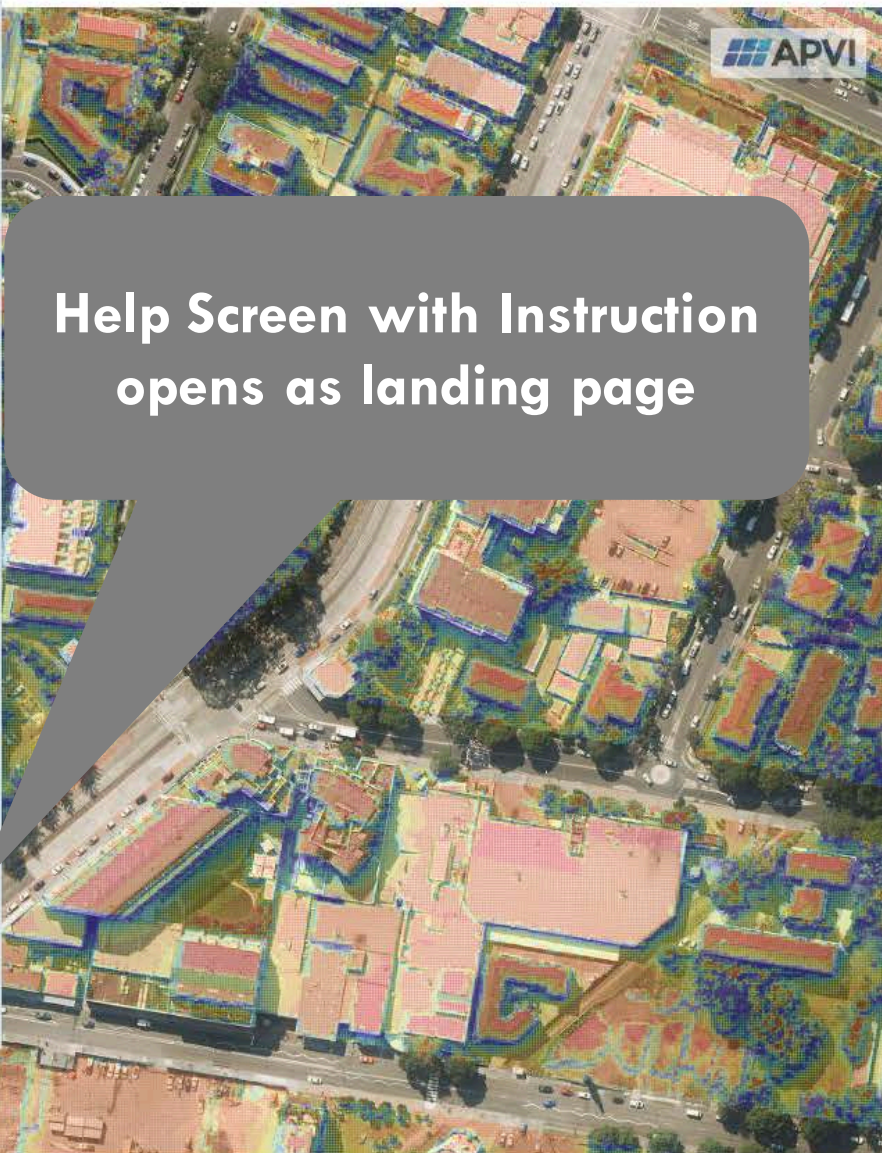
High solar radiation (insolation) areas maximise the output of your system. These areas are usually unshaded and approximately north facing, with tilt close to the latitude angle.

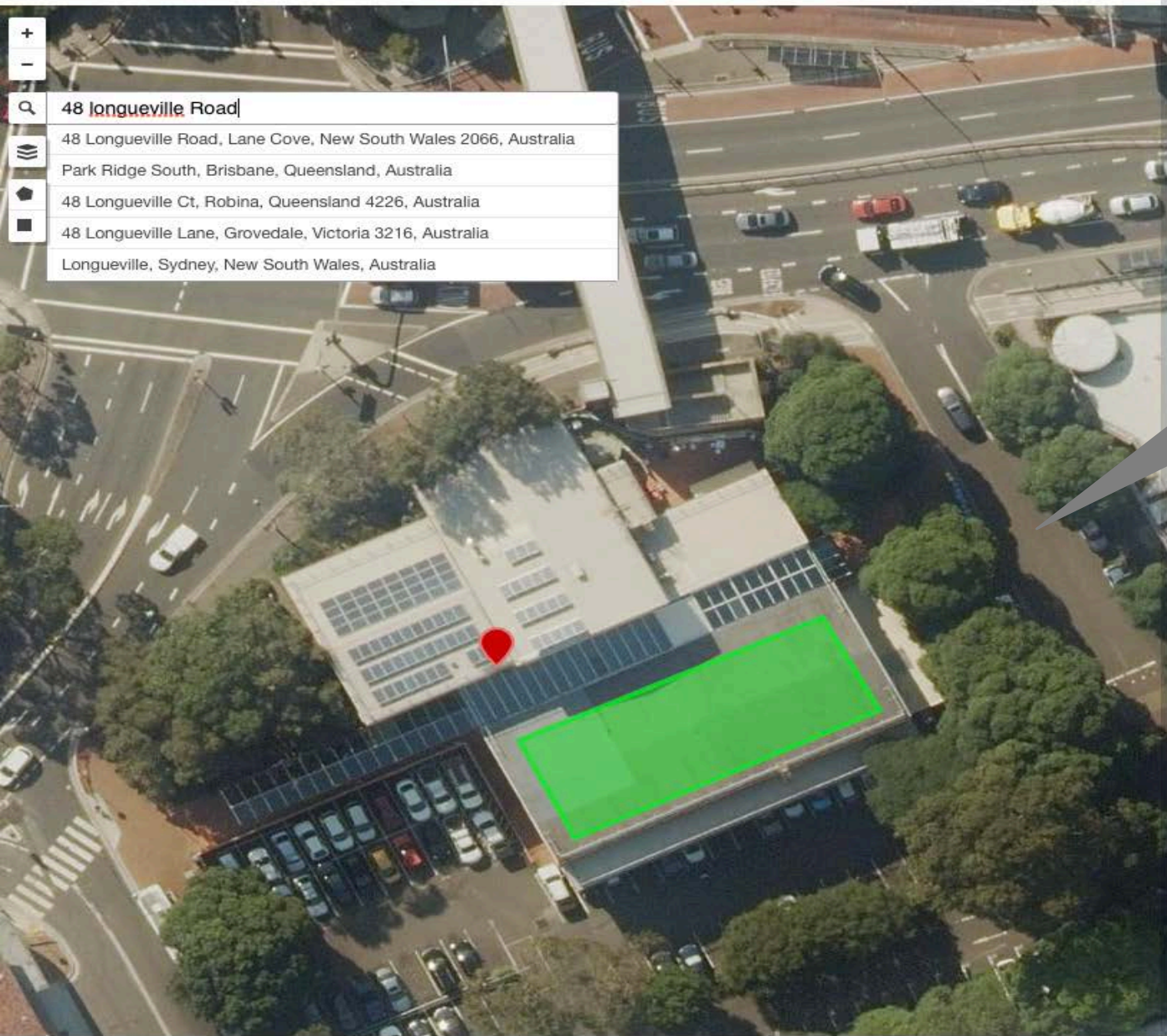


Using rack mounting to tilt your panels more optimally

improves the output, however the supporting structures may add cost compared to flush mounting.

Use the shading tool to rule out areas of low solar radiation – shading significantly reduces PV performance.





SELECTED AREA [Clear selection](#)

Approximate area 274.10m²

Insolation

Orientation

Tilt

Flash mounted system size

42.75 kW

AC power output per month

Month	AC power output (kWh)
Jan	6,400
Feb	5,600
Mar	5,600
Apr	4,800
May	4,000
Jun	3,200
Jul	3,200
Aug	4,000
Sep	4,800
Oct	5,600
Nov	6,400
Dec	5,600

Annual AC output

51,305.74 kWh

Annual output per kW of installed capacity

1,200.13 kWh/kW

Estimated annual value

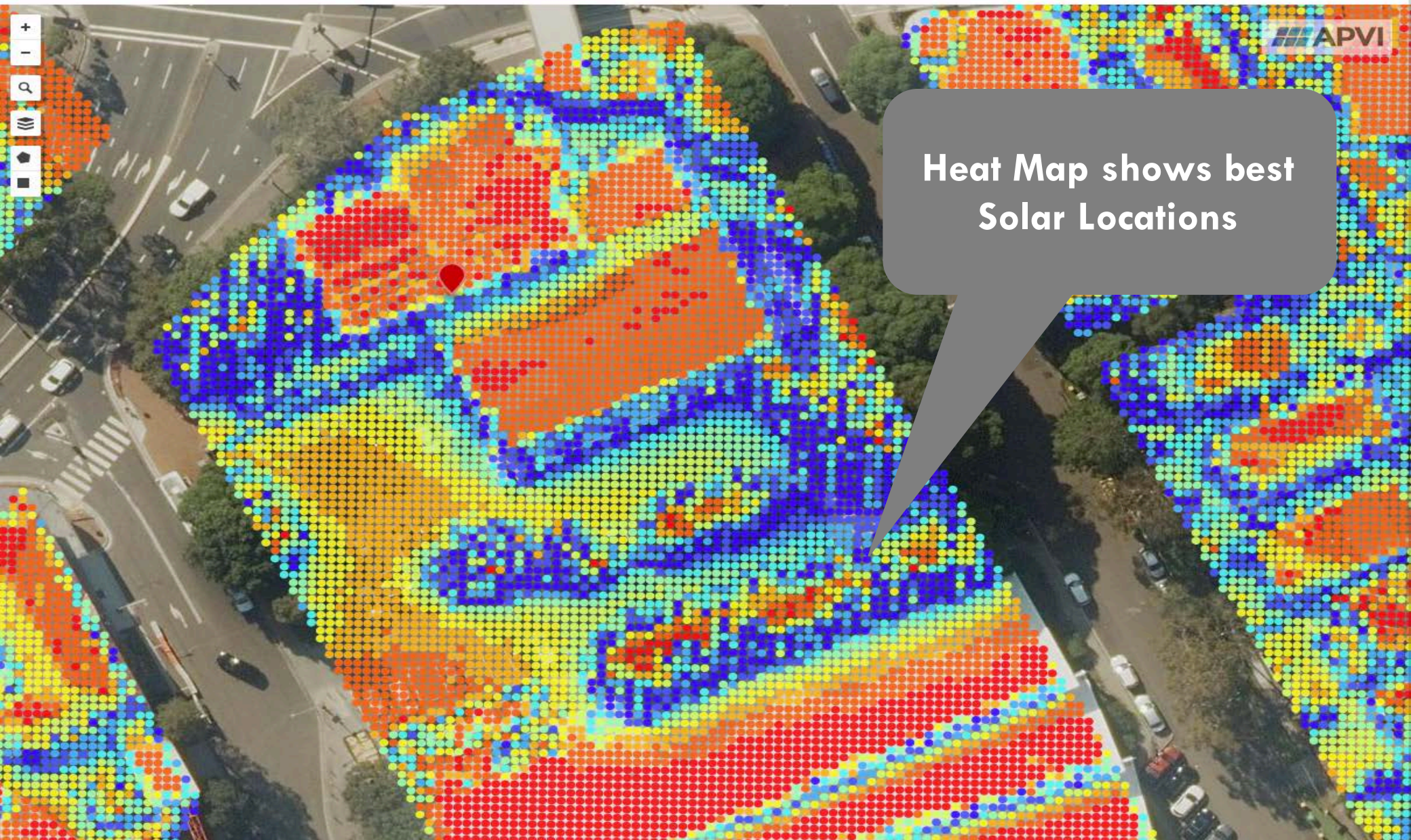
\$12,826.43

at 25 c per kWh

Annual CO₂ offset

40,788.06 kg

at 0.84 kg per kWh



Midday shadows: 80%

Show shadows at:

Equinox

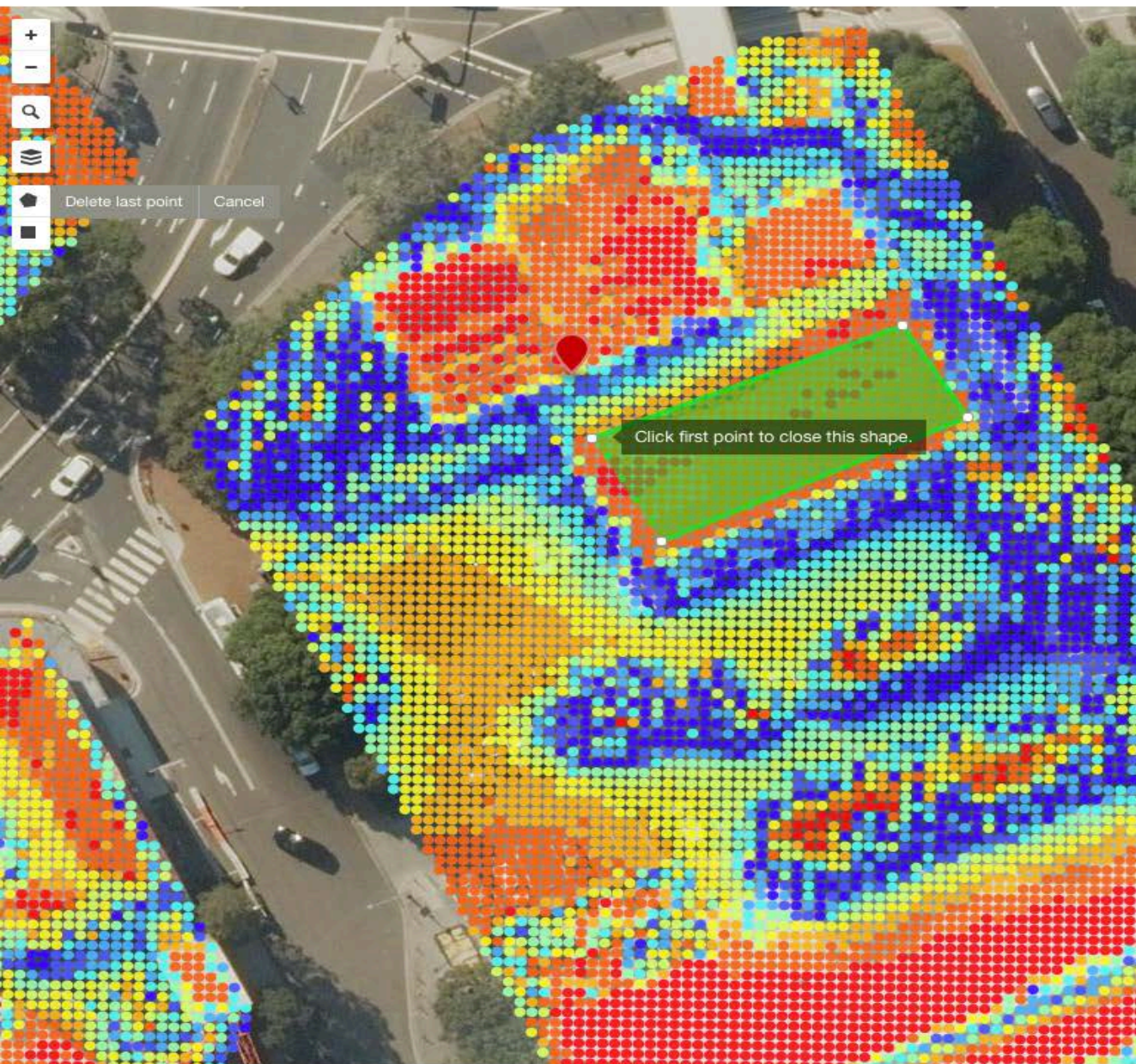
Solar radiation

93%

1.16 kWh/m²/day 4.83

AAM 3D building model 2013

AAM XYZ vegetation points
2007/2008



Once you've drawn the location of the array SunSPoT calculates energy generated, taking insolation, tilt and orientation into account

Midday shadows 80%

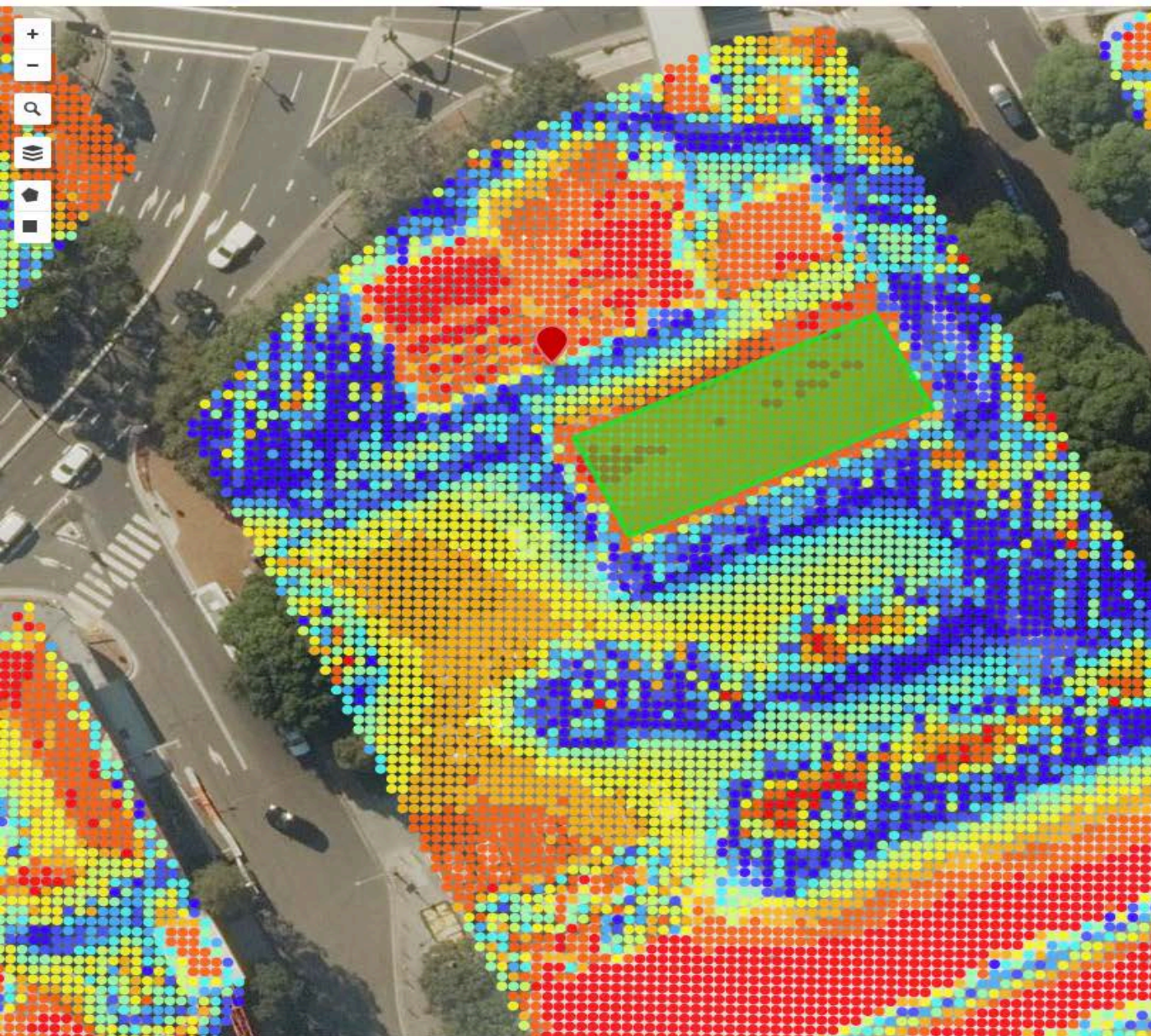
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Solar radiation

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SELECTED AREA

[Clear selection](#)

Approximate area

274.10m²

Insolation



4.27
kWh/m²/day

Orientation



Tilt



OPTIONS

[Flush mounted](#)

[Rack mounted](#)

Flush mounted system size

42.75 kW

AC power output per month



Annual AC output

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Annual output per kW of installed capacity

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FUTURE MAP ENHANCEMENTS

Potential future functionality:

- Integrate energy meter & tariff data in PV generation estimates
- Integrate “time-of-use”, export & Feed-in Tariff data for estimates
- Option to “include” battery storage device into savings estimates
- Develop community aggregation modelling
- Tariff Optimiser

Proven in Capital City CBDs

Now rolling out across Australia, in partnership with Councils



Dan Stevens

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SunSPoT

Understand your solar potential

 **AUSTRALIAN
PV INSTITUTE**