SOLAR APARTMENTS

NP4011

How can the 2.3 million Australians who live in apartments share the benefits of solar energy?

Research Questions

RQ1 How big is the opportunity for solar photovoltaics (PV) on apartment buildings?

RQ2 What is the value for households, electricity distribution networks, society and the environment?

RQ3 How can different technical and financial arrangements ensure equitable distribution of costs, risks and benefits?

RQ4 What regulatory changes are needed to make this happen?

Methodology

The project addresses:

RQ1 using **3D building models** and aerial images of urban centres (Fig 1);

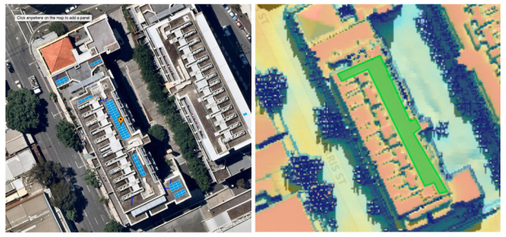
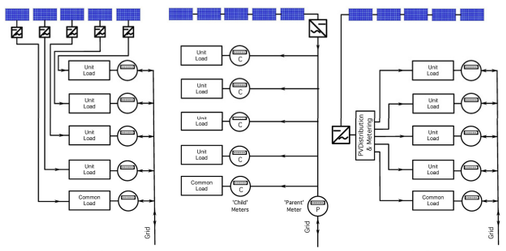


Figure 1: Rooftop opportunity assessment

RQ2 through **technical and economic modelling** of solar generation to supply apartments and common property electricity loads (Fig 2);



(a) (b) (c)

Figure 2: Technical Scenarios: (a) Individual systems, (b) Embedded Network, (c) Shared behind the meter

RQ3 by modelling the distribution of **costs and benefits** under a range of **technical and financial** arrangements (Fig 3), and through **case studies** to better understand risks;

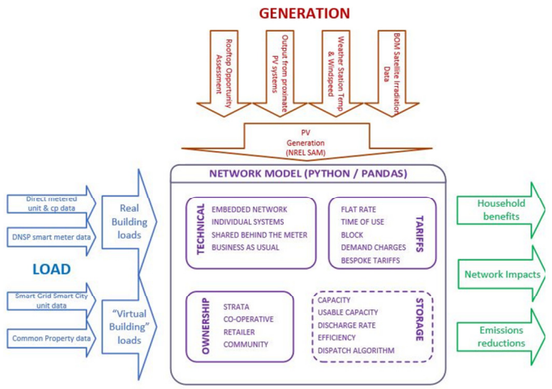


Figure 3: Schematic of Python model

RQ4 via **case studies** and stakeholder **interviews** and analysis of r**egulatory arrangements**.

Initial Results

Some highlights:

1 For many low-rise (61% of apartments), potential rooftop generation exceeds common property loads (Fig 4).

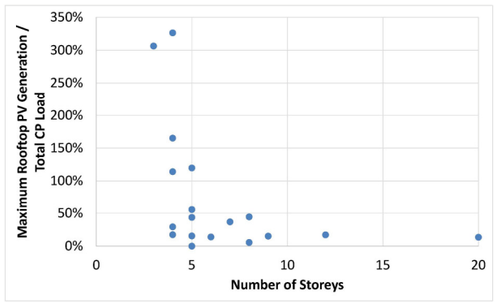


Figure 4: Ratio of potential generation to common property load

2 Embedded networks and load diversity increase self-consumption by up to 33% (Fig 5).

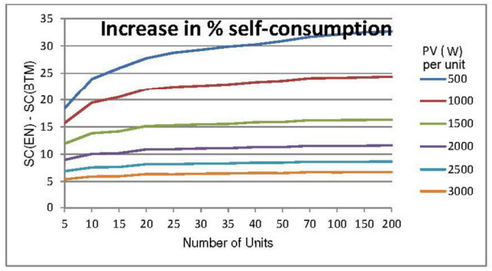


Figure 5: Increased self-consumption in embedded network (EN) compared to behind the meter (BTM)

3 Financial outcomes of embedded networks are highly sensitive to retail tariffs and to building-specific capital costs. In the right circumstances, PV improves viability (Fig 6).

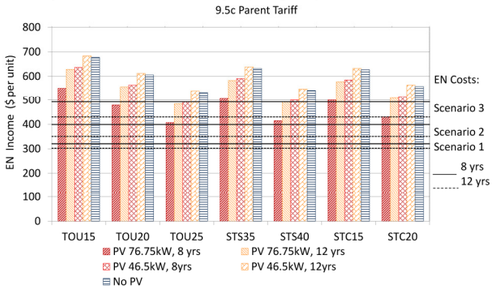


Figure 6: Outcomes for Embedded Network Operators with Time of Use and Solar tariffs under different EN cost scenarios and amortization periods for a 44 unit NSW building

4 Shared use of distributed energy resources and co-ordinated engagement in the energy market are held back by current and proposed retail and embedded network regulation.

Apartment residents should not be left behind in the transition to a distributed renewable energy system.

Anticipated impacts

This research will provide a body of evidence to support policy development to enable wider deployment of renewable energy on apartment buildings. Outcomes and recommendations will be shared widely with project partners as a basis for advocacy and to provide guidance and information to consumers.

Project Partners

Energy Consumers Australia, City of Melbourne, Green Strata, wattwatchers Digital Energy, EnergySmartStrata

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