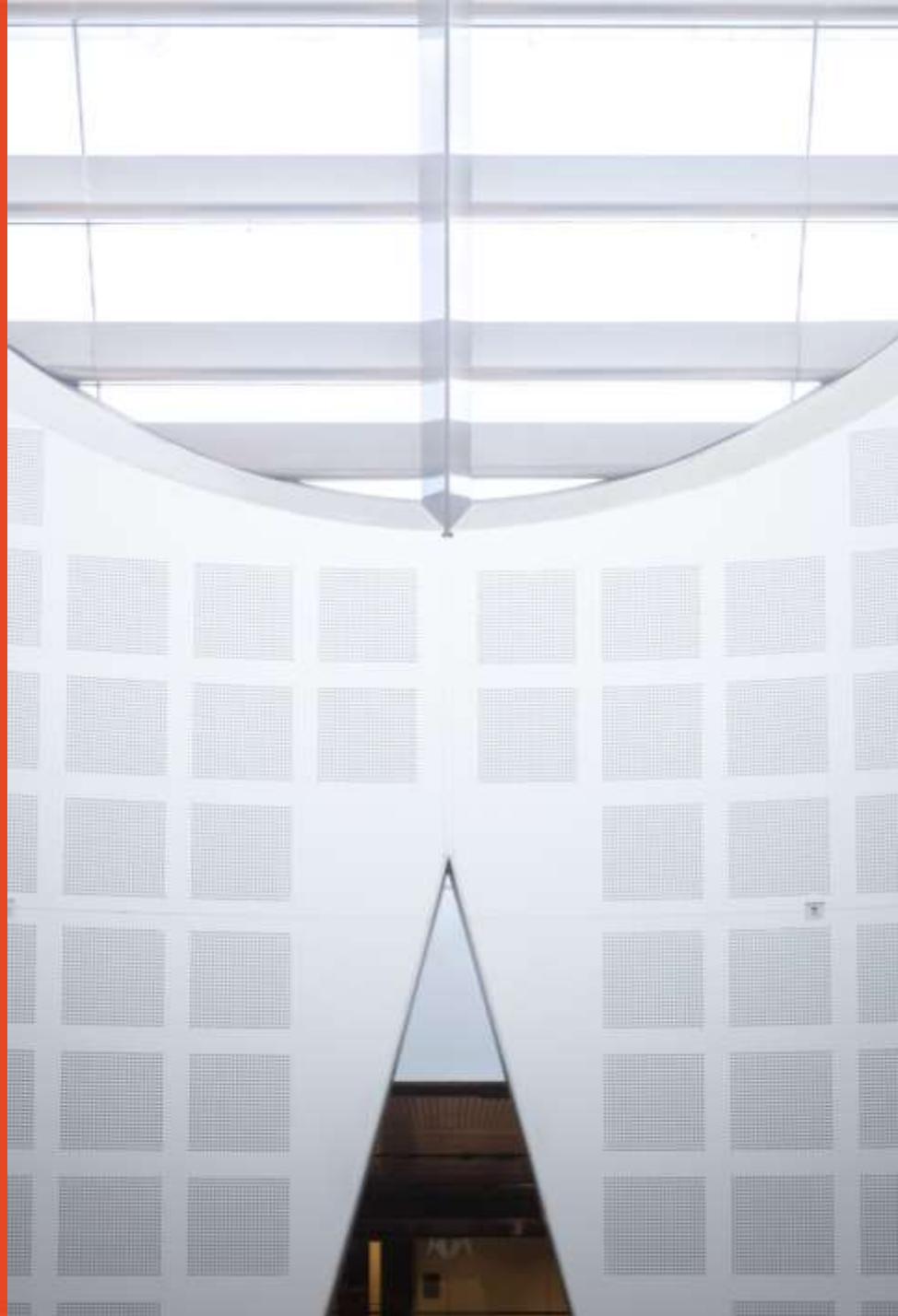


New forms of solar PV provisioning needed to advance energy justice for lower income households

Presented by

Associate Professor Lynne Chester
Department of Political Economy

2018 Asia-Pacific Solar Research
Conference, 4-6 December, UNSW



Overview

- Concept of energy justice
- Current energy landscape for low-income Australian households
- Findings from an Australian pilot project
- Concluding comments

Concept of energy justice

- Energy justice has been defined as:
 - ensuring that everyone can afford the energy they need for health and well-being. It comprises a range of factors ... [including] how government policies affect the way in which household energy is regulated, produced and priced, as well, of course, as the way in which individual household reliance on energy and needs come in play, and ensuring the needs of vulnerable households are met (Saunders 2011, cited by Hall 2013: 423).
- Others have conceived energy justice more broadly concerning human rights and capabilities that should apply **across the spectrum** of energy production and distribution to consumption and regulation.

Concept of energy justice

- Places attention on the equitable distribution of energy system issues (benefits and burdens), and the access to affordable energy by vulnerable groups
- **‘Energy’ PLUS social justice across the energy continuum**
- The concept makes assumptions about human rights and capabilities, and the role of energy in ensuring healthy lives
- Energy is viewed as a prerequisite to realise the essentials of life that require the use of energy

Current energy landscape for low-income households

- 21% (1.8 million) of Australian households fall within the lowest income quintile
- Main source of income for nearly 75% of these households is government pensions and allowances
- More than a third of these households are renters (nearly 22% in the private rental market)
- Australian low-income households have higher proportions with 5+ persons, multiple families, no dwelling access to the internet
- Poor Australian households (as elsewhere) spend higher proportions of income and expenditure on energy
 - 3.5% of average weekly **expenditure** on electricity (more than double that of the richest households)
 - More than 3 times the proportion of **disposable income** on electricity costs than the highest income households

Current energy landscape for low-income households

- These characteristics indicate some of the billing, contracting and technology issues for low-income households to access to solar PV
- Access to solar PV will also depend on willingness of low-income households to change their energy supply arrangements
 - Awareness, knowledge, trust, literacy/cultural barriers
- Existing research has focused on **current models** for solar PV adoption and framed solutions accordingly
 - Does not address the barriers posed for low-income owner-occupier households without the financial capacity OR low-income renters without rooftop property access rights
- **Policy settings** assume the energy consumer is rational, self-interested, and autonomous whose behaviour will respond to price and incentives, **and** an ‘inefficient’ energy user is suffering from a ‘knowledge deficit’

A recent Australian 'energy justice' pilot project

- A first step in developing new ways for low-income households (particularly renters) to access solar PV energy and thus have greater control to meet their energy needs and costs
- What did the pilot project do?
 - Mapped income and demographic data against solar PV take-up and capacity for take-up for each Australian Local Government Area (LGA)
 - Conducted focus groups with low-income households in the poorest Sydney LGA (Fairfield)
 - Reviewed current business models to 'encourage' solar PV used by energy companies, government and not-for-profit organisations
 - Analysed the legal and commercial issues of current business models

Pilot project findings

Income/demographic/solar PV mapping

- LGAs with the highest proportions of low-income households also have relatively higher proportions of:
 - Households with multiple families and more than 5 members
 - No access to the internet from the dwelling
 - Rented housing
 - Separate or semi-detached housing
 - An older age profile of household members
 - Predominant language spoken at home is not English
- LGAs outside each State capital city show higher proportions of low-income households, higher solar PV take-up rates, no dwelling access to the internet **but** lower proportions of multiple family households, and rented housing

Pilot project findings

NSW LGAs	% of H'holds with annual income less than \$65,000	Solar PV capacity installed (Kw)	% of dwellings with solar PV install.	Multiple family household	Five or more persons	Separate or semi-detached house	Rented Housing	Internet not accessed from dwelling
SYDNEY: Bottom 2 and top 2 LGAs ranked by income								
Fairfield	39.5%	31,881	16.8%	6.7%	20.9%	84.0%	31.2%	16.9%
Canterbury-Bankstown	36.8%	31,365	10.9%	3.8%	15.9%	82.1%	31.7%	15.2%
North Sydney	16.1%	2,524	6.4%	0.4%	2.2%	23.6%	41.5%	5.6%
Woollahra	15.3%	2,439	5.1%	0.6%	5.2%	41.4%	29.4%	5.3%
AVERAGE SYDNEY	26.8%	15,205	11.4%	2.5%	10.7%	66.9%	29.6%	9.5%
OUTSIDE SYDNEY: Bottom 2 and top 2 LGAs ranked by income								
Nambucca *	50.1%	6,601	25.2%	1.3%	6.3%	85.8%	21.3%	20.2%
Kyogle	49.1%	3,986	28.5%	1.0%	6.2%	94.3%	15.7%	20.7%
Yass Valley	25.5%	6,904	22.4	1.2%	9.9%	97.0%	14.1%	11.8%
Queanbeyan-Palerang	24.7%	17,041	17.3	1.5%	8.2%	85.4%	23.6%	11.1%
AVERAGE OUTSIDE SYDNEY	38.1%	12,303	21.4	1.0%	7.3%	77.0%	20.1%	18.5%

*6.3% of households with Aboriginal or Torres Strait Islander persons

Pilot project findings

Income/demographic/solar PV mapping

- Similar patterns found across Australia
- Overall, the areas with higher concentrations of low-income households have the highest potential capacity for solar PV given greater available rooftop capacity (and within capital cities these areas have high levels of rental housing)

Pilot project findings

Focus groups

- To understand issues influencing a low-income household's decision-making about energy needs, attitude to solar PV, and barriers and capacities to changing energy arrangements
- Three key reasons for not having taken up solar PV:
 1. Managing household energy use well (particularly post-retirement and children leaving home)
 2. Too old to recoup upfront costs of installing solar
 3. Do not know who to trust for expert information
- These reasons were intertwined with age being a key factor

Pilot project findings

Focus groups

- Very high level of understanding about the common marketing offer for household solar installation (high upfront costs plus suitable rooftop space)
- Family, friends and neighbours are primary sources of advice although many consider that the government should help them manage the risk
- Little difference is perceived between energy companies and thus little control over prices paid; so no need to switch
- Decisions about ways to manage household energy use and responsibility for bill paying differ between household types

Pilot project findings

Business models

– By three ownership types: customer, third party, community

OWNERSHIP TYPE	BUSINESS MODEL
Customer	<ol style="list-style-type: none">1. Fully self-financed2. Reduced upfront cost (with rebates) and electricity charges (with FiTs)3. Financed by government or energy company loans (interest or interest-free)4. Financed by local council and repayments from property rates5. Community bulk-buy of solar panels at a discount6. Micro-grid
Third party	<ol style="list-style-type: none">1. Power purchase agreement2. Operating lease3. Pay-as-you-go4. Solar hosting5. Micro-grid
Community	<ol style="list-style-type: none">1. Local government, developer, investor, and/or not-for-profit organisation2. Special purpose entity (energy company or households)3. Solar garden

Pilot project findings

Business models

- Most common model is designed around individual installation ownership requiring an upfront capital cost from the dwelling owner and rooftop capacity
- Government/energy company loan schemes are generally capped and have short-term repayment periods
- Scant attention provided to options for landlords with tenants realising energy savings

Pilot project findings

Legal and commercial issues

- Consumer protections and rights
- The terms of loans and leases
- Metering
- Responsibilities for installation property damage, maintenance and the removal of panels
- Buyout options for leases
- Sharing of benefits arising from rebates and incentives between energy companies or third parties with household energy consumers
- Criteria used to establish household eligibility for different schemes
- Costs and penalties for an early exit from a scheme

Pilot project findings

Legal and commercial issues

Two critical points:

1. **Different low-income household types** (e.g. renter with young children, multiple family, older) **need different options** to the current common upfront cost scheme
 - One option will not suit all low-income households
2. Options for low-income household adoption **need to address multiple issues** such as: roofing suitability; responsibility for operation and maintenance; access to consumer data; buyout options; equipment warranty periods; property access issues; consumer protections; control of the system etc.

Concluding comments

- Energy affordability is a major political and public concern
- Solar PV energy provides a key means for greater household control over energy costs
- Current solar PV models create a form of energy injustice for renters, and owner-occupiers without adequate financial resources
- Accessibility to solar PV by low-income households needs to be reframed from a problem to be solved by the individual household if ‘solar energy justice’ is to be available to all households
- The role and influence of family, peers and social norms on household energy use decisions should not be ignored
- Different household types and their respective ‘energy behaviour’ do not align with current assumptions about consumer and prosumer responses to price and incentives

Concluding comments

- **Local government could play a pivotal role** e.g. provision of ‘trusted’ advice; the financing of installations like solar gardens; working with property investors/developers/real estate agents to advance options for low-income renters
- The feasibility of new solar PV business models to provide widespread access for low-income renter households requires:
 - Explicit recognition of different household type energy use influences e.g. age, children, medical needs, multiple families, **and**
 - Resolution of legal and commercial issues, **and**
 - Willingness of these households to add solar as an energy supply source to their existing arrangements, **and**
 - Balancing of the complexity of issues for the range of parties involved (e.g. dwelling owner, real estate agent, housing authority, solar PV installer) **in addition to** the energy consumer-energy supplier relationship