

Post-carbon Resilient Future Cities NP5002

Networked finance of urban renewable energy systems – are novel assemblages making change?

Background

Cities are important political sites for advancing low carbon transition, recognising the significant GHG emission and energy consumption in urban areas. This partly reflects failed negotiations and inadequate policies to establish global limits on fossil fuel-intensive industries and practices at national and international levels (see McGuirk et al. 2016).



Existing research underscores the key role of energy in the production of urban environments. The availability and price of energy have produced distinctive urban morphologies including the separation of zones of production and consumption, the production of relational proximity between cities, and patterns and styles of building construction and design (Bridge et al, 2013).

Critically, energy technologies and networks are embedded in place through capital investment in built forms and consumer practices and habits (Dodson 2014), such that processes of renewable energy transition on the one hand, and fossil fuel dependency on the other, are underpinned by complex financial relations (see Castree and Christophers 2015).

Local governments are leveraging new sources of finance and novel actor arrangements through innovative financial mechanisms to drive renewable energy generation and use in urban localities.

Building on relational frameworks of low carbon transition, recent research examining decarbonisation initiatives in Melbourne illustrates the ways in which financial relations drive new configurations of actors, technologies and space that displace carbon (Hadfield and Cook, forthcoming). Local governments in particular are innovating to enable increased renewable energy generation and use. For example:

- **Bulk buy solar schemes** are reducing the upfront costs of solar PV for local residents
- **Repurposed land tax charges** are enabling access to renewable energy and reduced electricity bills for vulnerable residents
- **Collaborative PPAs** are facilitating investment in new large-scale renewable energy generation
- **Community solar cooperatives** are enabling local distributed ownership of commercial-scale solar PV

However, existing research has yet to illuminate whether novel financial mechanisms for renewable energy are enabling *socially equitable decarbonisation in energy systems at scale*.

Research Questions

This research hence asks:

1. How are innovative financial mechanisms for renewable energy deployment assembled in urban contexts?
2. How are these mechanisms enabling the scaling up of renewable energy supply to urban energy networks?
3. To what extent are these mechanisms unsettling incumbent fossil fuel-based energy systems locally?
4. To what extent are these emergent relations facilitating socially equitable distribution of a) investment return and/or b) access to clean energy?

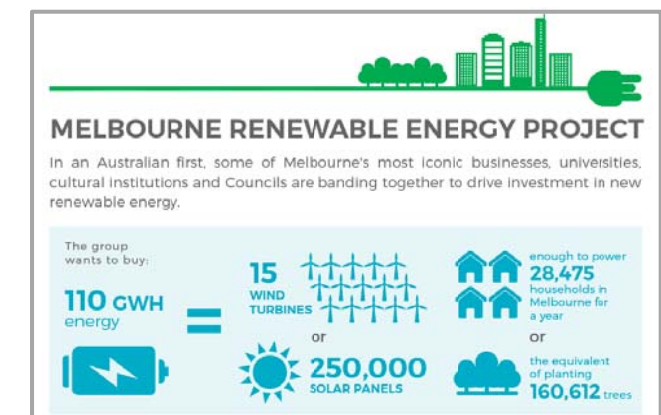
Methodology

Three innovative financial mechanisms for renewable energy in Melbourne will form key case studies for analysis (see right). Employing assemblage theory, semi-structured interviews with respective stakeholders will be used to trace the actors, relations, and urban form being assembled in order to:

- Understand how these financial mechanisms are disrupting or maintaining existing energy systems
- Understand the power relations enacted, entrenched or destabilised, relevant to the distribution of finance and access to clean energy
- Illustrate the extent to which local actors are achieving low carbon transition



Case studies: Melbourne, VIC



Anticipated impacts

Working with local government partners and a number of other stakeholders, this research will provide critical insights into cutting edge financing of renewable energy supply to cities and localities.

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