Local & community energy in 'Zero Carbon' New Zealand

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Motivation

- Households and communities a new focal point in energy research & practice

- Literature on civic energy has a largely European focus; now predominantly European phenomenon (Kelsey & Mickler, 2018)
  - Lack of data on ownership

- Role of civic actors in New Zealand's decarbonisation neglected
  - Lack of data, limited development, lack of policy discourse
  - High-level coordination and planning to facilitate distributed energy strikingly absent.

Research questions

- Forms and characteristics of local and community ownership
  - Relation to international typologies
  - Emergence from the governance context?
- Barriers communities face
- Role of these actors in New Zealand's broader energy transition
- Are there tried and tested policies that enable community energy organisations to participate/drive/share benefits of low emission scenarios?

Characterising local & community energy

- (Political) motivation
- Local embeddedness / engagement
- Legal status
- Energy activities (‘function’)
- Socio-political context
- Impacts

Becker & Kunze (2016); Hicks & Ison (2018); Hoffman et al (2013); Klein & Coffey (2016); Berka & Creamer (2018)

Data collection

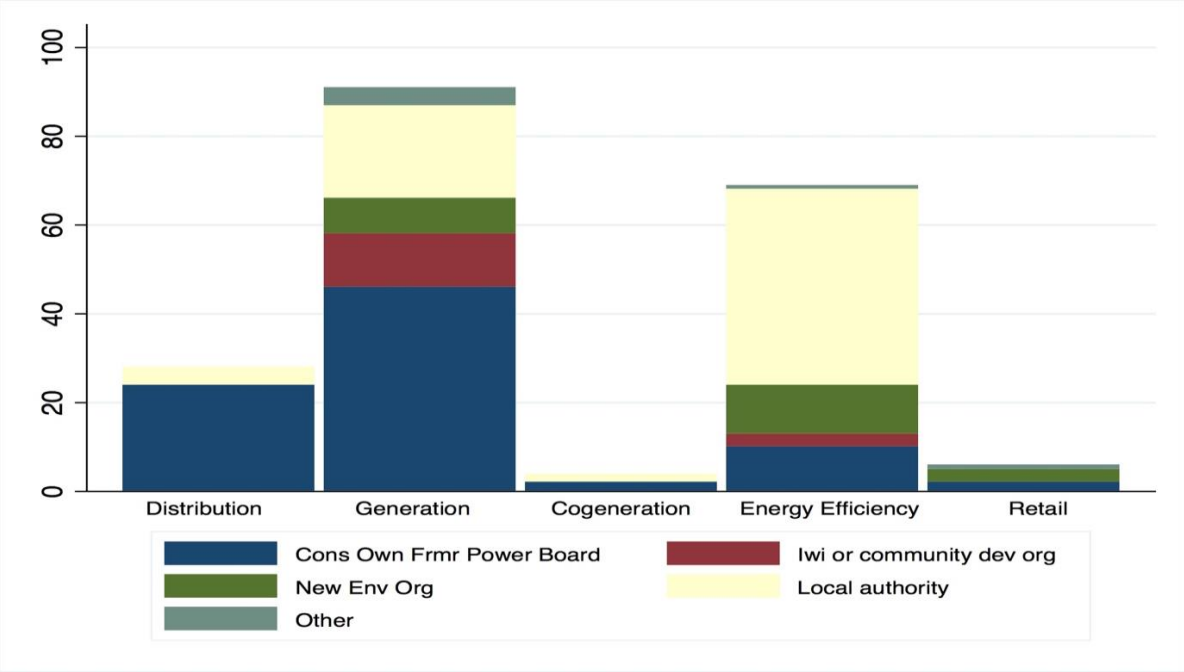
Data amalgamated from:

- Existing Generation plant data (Electricity Authority)
- Funding and awards projects (Energy Efficiency and Conservation Authority)
- Energy Trusts of New Zealand
- Community Energy Networks
- Co-operative Business New Zealand
- Web based search

35 semi structured interviews across all ownership categories (Nov 2015 – July 2018)

Sector overview

- 131 local & community organisations, 294MW generation capacity, 11 billion NZD in diverse locally owned assets:



Barriers & consequences

- Systemic market barriers beyond microgeneration
  - Mostly partnerships
  - Weak bargaining position ito finance, risk distribution and return, high failure rates
- No unified strategy
  - Lack of regulatory streamlining (Health & Safety, Anti-Money laundering, district & regional plans)
  - Lack of public support & awareness of the benefits / opportunities; local opposition
- Local government legally and financially constrained
- Ad hoc lifelines: MBIE grants, university projects, council grants, state energy efficiency programmes

Opportunities for local & community energy

The way we govern civic energy relates to how we frame science, technology & innovation policy:

- ~~To scale pre-commercial cleantech~~,
- ~~To drive technology differentiation,~~
- ~~To distribute the benefits of costly mitigation policies,~~
- To manage and capitalise on market-driven technology adoption,
- To prevent grid defection,
- To develop DS flexibility in order to accommodate increase in utility-owned intermittent generation assets

➢ Implications for alternative 'imaginaries', governance approach, models, extent of diversity and inclusiveness deemed desireable and possible

(Schot & Steinmuller, 2016)

Opportunities for local & community energy

MBIE, BEC, Vivid 2050 low emission scenarios	Opportunities for local & community energy
Reduced peak seasonal lighting & heating loads	EE and self-consumption
ST flexibility and ancillary services	Hydro (2-10TWh), demand response
20-50 TWh additional generation	Local / shared ownership in geothermal (8TWh) & wind (12-30TWh); solar (1-5TWh).
Renewable dispatchable alternatives to gas	Small-scale biomass CHP

Emerging models try to work around barriers

- **Integrated generation/retail projects (3) –** overcome wholesale market risk exposure, protracted feasibility stages.
- **Off-grid microgrids (2) –** iwi/island/rural LC, self-sufficiency / community development, energy access, alleviating constraints on remote uneconomic power lines
- **Peer-to-peer trading (3) -** power sharing, gifting and DSR, matching local consumption with local generation in real time, contributing to reduced peak loads and short term demand flexibility, feasibility/ pilots.
- **Virtual power plants (3) -** utility-led, alleviating grid constraints, remotely controlled community-owned grid-tied generation/storage assets.

Policies that enhance inclusiveness and diversity in ownership

Low cost	- Voluntary/ mandatory guidelines for shared ownership - Centralised strategy with targets - Concerted effort for regulatory streamlining - Regulated power purchase obligations and prices - One-stop-shop providing information, network and tendering services - Regional energy planning - Set aside public land for local energy projects - Public procurement programmes
High cost	- Seed funding / revolving funds / low interest public loans - Capacity market with special provisions

Conclusions

- NZ local & community energy is sizeable but distinct from European counterparts
  - Dominated by consumer-owned trusts in distribution & Māori organisations in large-scale geothermal generation.

- An absence of low risk mechanisms for market integration precludes widespread ownership in generation.

Conclusions

- Lack of a unified strategy precludes alternative ‘imaginaries’

- Range of policy options exist that would enable more diversity and inclusivity (across organisational types and socio-economic income categories)
  - Have to be evaluated ito cost, socio-economic and environmental impacts against BAU technology adoption trends

Thank you….

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