

## Microgeneration and the Environment

Opportunities and Barriers




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## Why is the PCE interested?

Microgeneration systems can contribute to an "environmentally sustainable" energy sector for New Zealand




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## What is does 'environmental sustainability' mean?

<b>Regeneration</b>	Using renewable resources efficiently <small>(i.e. Resource use that doesn't exceed rates of natural regeneration)</small>
<b>Substitutability</b>	Using non-renewable resources efficiently <small>(i.e. Limiting use to levels that can be substituted by renewable resources or other forms of capital)</small>
<b>Assimilation</b>	Resource use that does not release hazardous or polluting substances above the environment's assimilative capacity.
<b>Avoiding irreversibility</b>	Avoiding the irreversible impacts of human activities on ecosystems.

Source: OECD




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### Why does the PCE support microgeneration?

- Uses energy resources - especially renewable resources - that are unsuitable for larger scale applications (e.g. solar, small wind and hydro energy sites, biomass)
- Can generate and use energy more efficiently and effectively (if done well)
- Reduces greenhouse gas emissions associated with energy generated from fossil fuels
- Avoids many of the negative environmental impacts associated with large-scale generation.



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### How does the PCE define microgeneration?

- Systems that provide energy services at a smaller scale and close to the point of use
- Broader concept than just the generation of electricity.
  - Improved provision of heat (use of efficient wood burners, fuel switching, better building design, insulation upgrades etc.)
  - Light through better building design
  - Direct use of mechanical energy



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### PCE's critical success factors for microgeneration

- Microgeneration requires a 'systems approach' and understanding of
  - required energy services (demand)
  - available energy resources/options (supply)
- If the microgen system provides energy services inefficiently it will fail -economically and environmentally
- Reducing energy consumption is often less expensive than supply options.



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## How big/small is microgeneration?

- Difficult to be size specific rather we focussed on a range of applications:
  - Houses
  - Neighbourhoods
  - Farms
  - Small rural communities (or is this embedded generation?)
  - SMEs
  - Community buildings (halls, libraries)




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## What is the microgeneration potential in NZ?

- Difficult to assess (assumptions about technology development, future energy prices, regulatory environment)
- An initial attempt has been made
  - PCE work undertaken by East Harbour Management Services (2006)
- Looked at a range of heat, mechanical and electricity provision technologies




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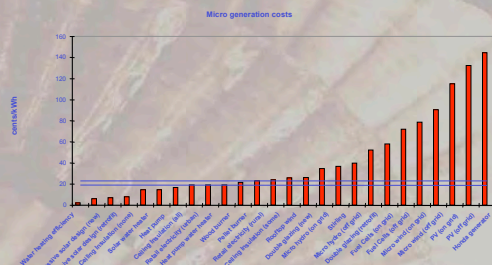
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## Assessment of Potential




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### What are the barriers? (cont.)

- Regulatory framework
  - EIRA 1998
  - Need for standardised/simplified approvals (from Energy and Lines Co.'s and Local Govt.)
  - Building code and RMA 1991
  - Technical performance standards for microgeneration systems
- Industry expertise (capacity)
  - Installers
  - System designers
  - System accreditors
  - Approval and compliance staff



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### What are the barriers? (cont.)

- Fragmented research approach - do we need a research strategy for microgen?
  - To identify gaps and opportunities
  - Build on overseas experience (so we don't reinvent the wheel)
  - Fund demonstration projects (learning by doing)



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### Microgeneration of electricity

- Highest profile of all forms of microgen but:
  - Most expensive option (in pay back terms)
  - Most potential for conflict with the status quo
- But also many potential benefits
  - Can complement existing electricity system through better system security
  - Can increase competition in the electricity market
  - Development of micro-grids
  - Off-set investment in large-scale generation



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Let's kick-start the "debate"

- Are microgeneration systems part of NZ's energy future?
- Is investment in microgeneration systems worth the effort?
- What role, if any, should the Government play?



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