

# **“Growth without Guilt”: Better transmission scenarios**

**Comments on “Generation and Demand Scenarios”**

[http://www.gridnewzealand.co.nz/f1881,4742610/4742610\\_wp1-scenarios-consultation-oct-08.pdf](http://www.gridnewzealand.co.nz/f1881,4742610/4742610_wp1-scenarios-consultation-oct-08.pdf)

Molly Melhuish melhuish@xtra.co.nz

Domestic Energy Users' Network

**For Transpower's Transmission 2040  
Stakeholder Workshop, 5 November 2008**

# Transmission planning is essentially power planning: requires effective stakeholder input

- Domestic Energy Users' Network represents people who pay 46% of New Zealand's electricity bills.
- Transpower's long-term scenario project is welcomed as a chance for public input into its 40-year plan for transmission investment
- Transpower has chosen four scenarios to describe the context of transmission investment – based on
  - whether new generation is remote from, or close to, load centres
  - Whether electricity demand growth (assumed similar to GDP growth) is high or low
- The scenarios ignore major options for domestic consumers to keep electricity bills down
  - Price-responsive demand – this is not offered by the present electricity market
  - Efficient wood burning to reduce winter peak electricity demand, which is the most important driver of transmission investment
- DEUN requests that Transpower scenarios include both options, and invests as necessary to gather and prove data on costs and benefits of both of these.

# “Constructed” future must be possible. Suggest change the scenario names

- “New Norway: oil bonanza scenario – NZ gets rich. High demand growth, low emission scenario using traditional technologies.”

Call it “Think Big”, because it is the same strategy as government’s response to Maui discovery

- “Crisis recalled: Climate change not an issue. High growth results in high demand. Generation built locally, but not small scale.”

Call it “Growth without Guilt” – where climate change response includes massive use of carbon-zero bioenergy including high efficiency home wood burning, central heating, and combined heat and power (100 kW -10 MW). Creates many jobs, leading to high GDP growth

- “Fragmented World: Low global growth, with focus on national interests. Economic issues take focus away from climate change.”

Call it “Business as Usual” as it is very similar to the NZ Energy Strategy

- “Green Communities: Low growth scenario with strong focus on energy savings and small scale, local generation. Carbon capture not allowed”

Call it “Conservation” – this scenario implies risk of real deprivation if fossil fuels not replaced by biomass

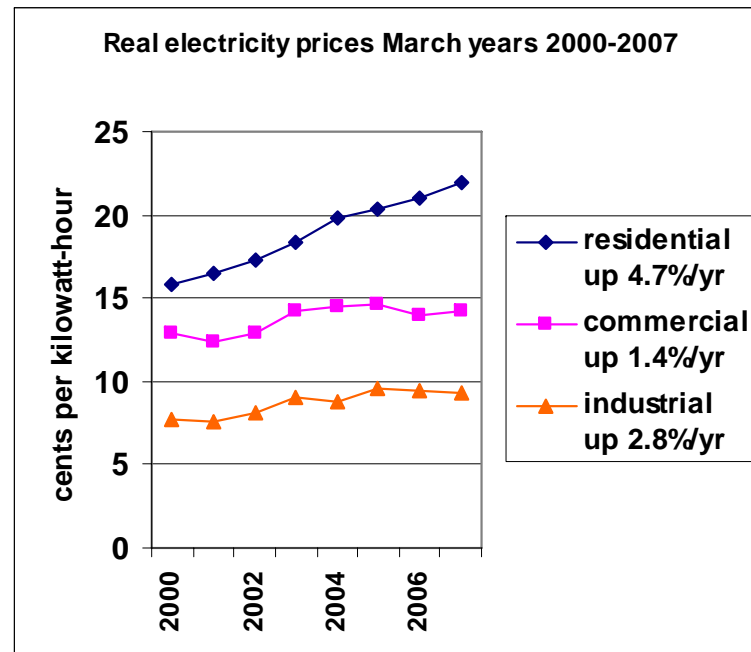
# New themes suggested

- Make clear to what extent decision-making power lies with big business, and to what extent, with consumers and communities
- Describe to what extent scenario is based on planning (blueprint), and to what extent, with unregulated market (scramble).
- Note: culture change required for “consumer decision-making”.
- Technology change - smart 2-way networks, both transmission and distribution, are required to enable decentralised decisions
- Describe whether each scenario promotes economy of scale or economy of scope, and consider how Transpower might recognise the latter.
- Biomass is a typical example of economy of scope – it creates far more than energy.
- “Growth without Guilt” scenario should include “urban forestry”, with trees used for firewood, compost, storm water management, shade, and food, as well as amenity

# Where Transpower scenarios are unrealistic

- “New Norway” (Think Big) not consistent with very high carbon price, because of low net energy yield from all unconventional oil. Very high carbon price requires decentralised solutions. Suggest medium price for “New Norway”, and high price for “Crisis recalled”.
- “Crisis recalled” is either thermodynamically impossible, or assumes world climate-change denial. Cheap energy would mean continuing subsidy, hence would cause step change not very far in future. The “disruptive plan” that avoids crisis should be massive urban and peri-urban forestry plus super-efficient biomass for electricity and heat. Carbon price should be very high, but impact on economy is low because biomass is carbon-zero or –negative, and creates jobs.

- Residential price cannot be 21c/kWh (it is 23c already). Industrial price cannot be 17c, it is 9c now, and not rising much
- Transpower needs real data on costs and implications for peak demand of residential heat pump vs wood burning, as this drives winter peak demand



# Four futures

High end-use energy demand

## Think Big

- *Scramble*
- Decisions made by big business; gov't held hostage (as for Maui)

## Growth without Guilt

- *Blueprint*
- The technology defines the resource: 1-10 MW combined heat + power
- High end-use demand, smart transmission and distribution grids
- Culture change, re-regulation
- Domestic consumers able to respond to electricity costs
- Transition towns

Remote  
Economy of scale  
Long payback

## Business as usual

- *Blueprint*
- NZ Energy Strategy and “Transmission to Enable Renewables”

Local  
Economy of scope  
Quick payback

## Conservation

- *Scramble*
- Low growth, low energy demand

Low end-use energy demand

# Some specific assumptions needed on

- Policy:
  - Whether Household Fund is implemented - this will have big effect on peak demands from household sector.
  - Funding/ policy will determine whether decentralised technologies succeed
  - GDP forecasts are not very meaningful in depression/biomass scenario
  - Fuel switch – growth in resid. end-use wood in mid 70's, was techn-driven
  - Policy for urban trees would create major resource
  - Re-regulation required for decentralised electricity to compete with remote
- Exogenous:
  - Technology costs, wholesale electricity prices – much wider range needed
  - Electric vehicle development is exogenous (yet vehicles could be NZ-made)
  - Figure 6-1 needs to include 1-10 MW CHP using wood chip, and 35-100 kW central heating boilers, using logs or wood chip (not pellets)
  - Need costs for storage of energy in large Hot Water “accumulators”
  - Thermoelectric generation on wood-fired central heating systems
- Other
  - Biomass scenario benefits from high “smart” network investment: see p. 86
  - Ahuroa gas storage completely changes marginal cost and emissions of winter energy