

# Planning and Markets

## An Economist's View



EPOC Winter Workshop

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## Outline



- The social context of markets
  - Natural and constructed markets
- Challenges for electricity market creation
  - How country-specific factors magnify/mitigate these
- The implications for our (NZ) industry

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## Markets need support



- A natural market is one that will evolve spontaneously
  - e.g. physical produce markets for farmers & fisherpeople
- Even these need supporting rules/conventions, such as:
  - A regular meeting place (which may need to be rented) & time; and
  - A system of property right assignation and enforcement.
- Other “markets” are created by entrepreneurs or groups
  - e.g. NZSX; car fairs; trademe;
  - This is a great business model, because of network effects
    - Thicker (more heavily traded markets) are better, so market makers try to use the market rules to increase trading volume/value
  - These markets (and their participants) benefit from careful attention to rules/conventions.

## Market failure



- Some markets fail before they get started
  - The dot.com boom brought forth many aspiring market makers
    - Catalog sites
    - Trading portals
    - Request for quotes sites
  - Most failed; a few have prospered
- Other markets get running, but fail in a broader economic/social sense
  - e.g. markets in the transport sector create excessive pollution because the social cost of emissions is not included in the prices observed by users.

## Where does this get us?



- Markets are almost miraculous allocation devices
  - The invisible hand really is a great co-ordinator
- But...
  - Many markets need careful design
    - e.g. NZEM
  - And some benefit from ongoing external constraints
    - e.g. through taxes & subsidies to reflect externalities
- So a mixed system is likely to be best overall
  - “As much market as possible; as much government as necessary.”

## Electricity Markets Issues



- Short-run issues (i.e. ignoring investment)
  - Plant level productive efficiency
    - Most likely with “for profit” firms, or a close approximation
  - System level productive efficiency
    - How to get efficient dispatch?
    - Would a benevolent and omniscient system operator call a different list of plant than would run under a commercial offer system?
    - If so, how much does out-of-merit dispatch cost?
  - Allocative efficiency
    - This means arranging things so that end-users face marginal production costs
    - However there is no point in making prices volatile if end-users can't respond – i.e. how variable should prices be?

# Electricity Market Issues



- Just a single long run issue
  - How does the market incentivise efficient new investment in generation and transmission?
- From an economic angle, there are two difficulties
  1. Interdependence between generation and transmission
    - These are economic substitutes &/or complements.
    - So transmission investment can create enormous shifts in wealth between users (generators & customers)
      - Agreement is virtually impossible, so upgrades must be centrally planned
      - But the efficient upgrade path depends on what new generation will be built, and vice versa
      - So benevolent and omniscient grid planners need to solve a competitive investment “game” to get the answer right.

# Electricity Market Issues



2. Lumpiness of some generation investment
  - Lumpiness is not an issue for transmission, since this must be centrally planned and funded
  - Not a major issue for wind either, since can scale the project quite accurately
  - May be a more serious issue for thermal plant such as gas turbines, for which investment will depress prices (contract/retail and spot).
  - In that case, investors may perceive that post-investment prices are too low to justify investment.

## Country Specific Factors



- Lumpiness is more of a problem in a small market
  - What matters is the minimum size of the efficient increment in capacity, relative to the market volume
  - Expect this to be a more serious problem in NZ than elsewhere
- Other small market issues:
  - Because there is a low amount of physical volume, the basis for financial market activity (e.g. hedges) is also lower
    - Obviously, NZ has no chance of a liquid hedge market under the current industry structure
    - However, we may also have no chance under the alternative that is most conducive to wholesale contracting.
  - Fuel uncertainty compounds lumpiness problem for thermal plant
    - If next tranche of gas is to be imported, the post-investment power price that justifies investment is even higher

## Evolution of the NZ Industry



- Electricity industries worldwide are in flux
  - A very large scale natural experiment is going on!
- Our (NZ) problem set is unusual
  - Becoming fuel constrained
  - High barriers to generation entry (thin contract market)
  - No chance of international trade (except in fuel)
  - Rapidly eroding reserve margin
  - Government is active in procuring/underwriting generation
- So, what needs doing?

# A Way Forward



## 1. Leadership

- Government is embedded already. They have no real chance of committing to not meddle further (anyone with a plan will be asking for assistance). So, face facts, admit there is a need for policy leadership, and design a process that supplies it.

## 2. Analysis & Debate

- Define and distill the underlying problems with the current arrangements. These may simply amount to a lack of clarity over roles, or they may include more fundamental issues such as those raised here. Design systems that might solve the problems, and compare the illness with the medicines!

## 3. Action