



**NEW ZEALAND INSTITUTE FOR THE STUDY
OF COMPETITION AND REGULATION INC.**

Reporting the Economy

Sustainability and Water, Electricity, Gas etc Policies

Journalists' Training Organisation Course

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Overview

- Introduction
 - Institutional arrangements for efficiency-improving trade in water in New Zealand
 - New Zealand's existing water market(s)
 - Interaction with other markets
 - Approach to governance



Desirable Institutional Arrangements for Water

- Recognise known supply variation characteristics
 - Recognise *uncertainties* and manage change using *evolving knowledge* about
 - Sources of supply
 - Externalities
 - in quality effects, and
 - as between sources of supply
- i.e. be robust
- Facilitate decentralised decisionmaking: via low transaction cost
 - change of users,
 - change of use, and
 - valuation of water



Decentralised Decision Making

- Requires allocation of water rights to users that are generally
 - not tied or use specific
 - enable exchange
 - for an indefinite period subject to
 - implications of learning about uncertainties relating to the sources of water and their interactions
 - unbundling dimensions of effects
- Does not require “thick” markets, but mechanisms that speed up exchange based on water value, generally, do improve dynamic efficiency
 - By assisting earlier better allocation, and
 - By making responses available to unfolding uncertainties



Decentralised Decision Making In New Zealand

- RMA
 - Enables decentralised decision-making within regional (Council) boundaries
 - Requires regional (Council) plans that set water availability
 - Requires allocation on a first-in first-served basis
 - Enables exchange; but rights
 - Are often specified by use in district plans
 - Are often for short periods with different criteria for review
 - Are bundled with dimensions of effects
- There are some water markets
 - Local irrigation markets where rights are transferable as cooperative company shares
 - A nationwide market derived from electricity



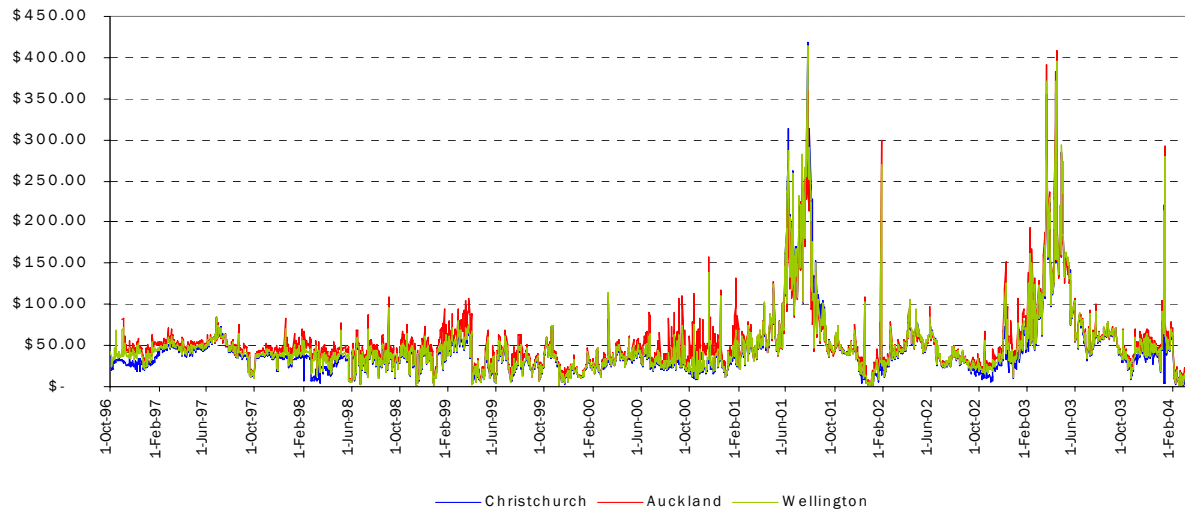
The Electricity Water Market

Country-wide Decentralised Management

- Some 2/3rds of electricity generation is hydro: limited storage
- Prices at 240 nodes
 - produce a residual value for water in (20) catchments utilised by hydro
 - “One national market” price driven by the “basis” price
- Has a governance structure enabling agents to act independently under local conditions but coordinated via price signals, inducing substitution
 - between fuels: water, gas, coal etc
 - between catchments in water used
 - By generators spot market offer decisions
 - By generator hedges
 - between time periods by means of storage
- Long and short term (spot) contracts assist decentralised management of fluctuating water availability



Management of NZ's Intrinsic Fluctuating Scarcity



National water market has shifted the risk of scarcity from households to those most able to manage it: industrials



Allocating Water Among Alternative Uses

- The NZ electricity market provides a residual value for water and manages water scarcity across regions, time, relative to other fuels and (potentially) other uses such as irrigation.
- How should this allocation be done: by centralised administration following cost-benefit analysis or by transfers of rights



CBA Example

Irrigation vs Electricity Generation on the Waikato River

This is an illustrative example: it does not convey a view about the relative merits of the alternatives

- Suppose Irrigation takes water away from Mighty River Power's plants on the Waikato River
- The CBA should compare the economic value added of irrigation (including monetised social externalities) to the value of any reduction in electricity production
- Suppose that external effects include increased algae growth in the river and the possibility that hydro generation will be replaced by thermal generation.
- A proper CBA would do detailed calculations of the returns to irrigation based on the parameters of the district: a rough approximation will be used here



CBA Example (con't)

This is an illustrative example: it does not convey a view about the relative merits of the alternatives

- Prices of water paid for irrigation in Canterbury irrigation schemes (Rene Le Prou's Thesis) values water at \$0.016 to \$0.117 per m³. (this is less than that reported for Australia)
- If we assume the efficiency of hydro generation at one generation plant is the average reported for the 7 plants on the Waikato River and a wholesale electricity price of \$75/MWH we find that the value of water in electricity generation is \$0.006/m³ per plant or \$0.042/m³ if it passes through all seven of MRP's Waikato River plants.
- The externalities should be included as a cost and it can be shown that a \$25/tonne carbon charge on generation replacing the MRP generation will not raise the value of (hydro) electricity relative to irrigation to an extent that affects qualitatively the ranking.



CBA Example Lessons

- CBA requires assumptions and decisions about matters that are intrinsically uncertain and about which different people might reasonably have different expectations
- Decisions made by Commissioners are decisions made by persons with no stake in the outcome
- Allocation for use (even imposing “efficiency” requirements)
 - makes the “right” unnecessarily uncertain to the holder that will affect its use of it
 - limits the transferability in use: who what/how is reallocation to be determined
- The process bundles allocation of water per se, with nutrient management, carbon management and alternative uses



Blue-Print for A Robust System for Tradable Allocations

Drawing on

Defining Tradable (Water) Entitlements and Allocations: A Robust System: Mike Young and Jim McColl, and *Essays on Water Allocation in New Zealand: The Way Forward* (www.iscr.org.nz), Lewis Evans and Kevin Counsell

- Goal economic efficiency (includes treatment of externalities). Assignment of allocations not set by property rights may reflect equity/efficiency
- The number of instruments should equal the number of targets
- Each instrument should be assigned a target
 - A price for every scarcity: single prices (markets) cannot serve multiple purposes (targets)
 - Allocation separate from use, nutrient restrictions separate from allocation
- Governance that
 - Develops and uses catchment plans, and use licences to manage externalities
 - minimises transactions costs (mix of private and public)
- Governance and instrument design that are robust
 - Allocation based on shares of a definable (albeit estimated total)
 - Allocation in perpetuity: note use rights (also tradable)
 - Minimise swings with election cycles



Governance that Contributes to Sustainable Economic Activity is Ripe for Consideration and Implementation in New Zealand in a Wide Range of Areas

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

- Electricity
- Water
- Gas
- Forestry
- Nutrient
- Infrastructure
- etc etc

