
Reversibility of Renewable Energy Developments

May 2009, Palmerston North

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Outline

Content of Presentation

- Who am I?
- Why have I made a submission?
- What research have I undertaken?
- What did I find?
- Conclusions re the policy
- Questions



Glines Canyon Dam – 13.3MW, 65m high. Elwha River, WA

Who are Kevin Oldham and SPX Consultants?

- Bachelors and Masters degrees in engineering from Canterbury University, MIPENZ
- Environmental engineering consultant for over 25 years
- Former senior executive in Maunsell | AECOM
- Last 3 years own practice – SPX specializing in consents relating to major infrastructure developments
- Also assistance to corporations for strategic foresight and corporate strategic planning
- Experience includes renewable and non-renewable energy developments in NZ and SE Asia.
- Recent clients include NZ gentailers and international energy companies



Objective of SPX Research

To research reversibility of renewable energy developments and present findings in a fully referenced research report.



Approach

- Case study – based approach
- Literature search for case studies - focus on US case studies for hydro dams as biggest data set
- Communications with university engineering schools and river restoration activists in US
- Brought own experience to bear
- Analyse and interpret
- Prepare draft report
- Peer review
- Finalise



Why make a submission ?

This submission has been entirely funded and prepared by SPX Consultants for the public good.

Reasons for the submission:

- Intrinsic appeal of reversibility as a concept for guiding decision making.
- Concern about statements in some documents around the reversibility policy.
- Desire to help public policy formation in this instance.



Publication of Findings

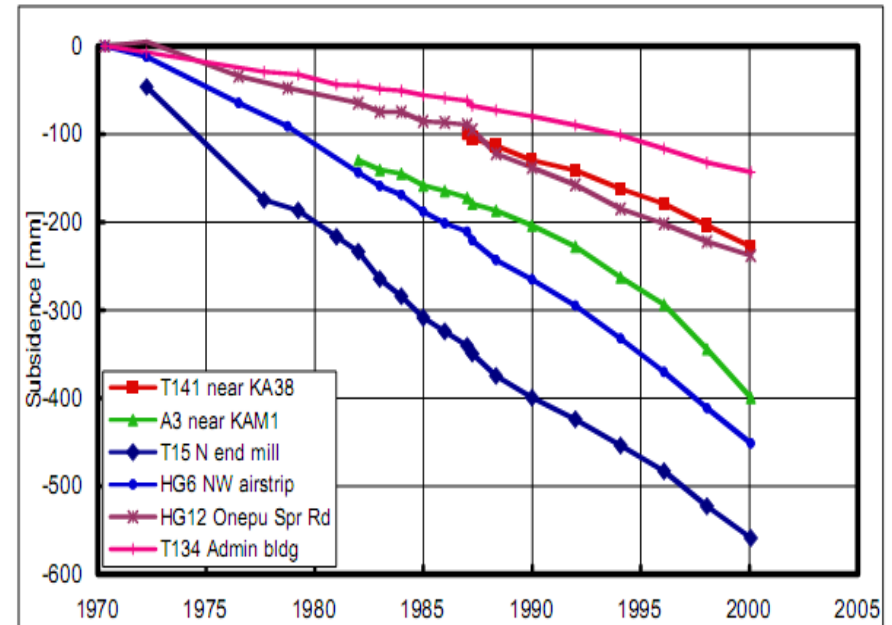
Summaries based on research published in:

- Are hydro-electric developments reversible? (November 2008). *Resource Management Journal - Official Journal of Resource Management Law Association of New Zealand Inc.*) pp 7-10.
- Decommissioning Dams - Costs and Trends (2009). *International Water Power and Dam Construction*. 61 (2), p30-35. *Progressive Media Markets, UK*.



Surprises

- No collation of experiences in reversibility of renewable energy projects in the literature.
- The size of dam removals planned in the US.
- The amount of settlement from some geothermal developments.



Subsidence at Kawerau Steam-field

Summary of Findings

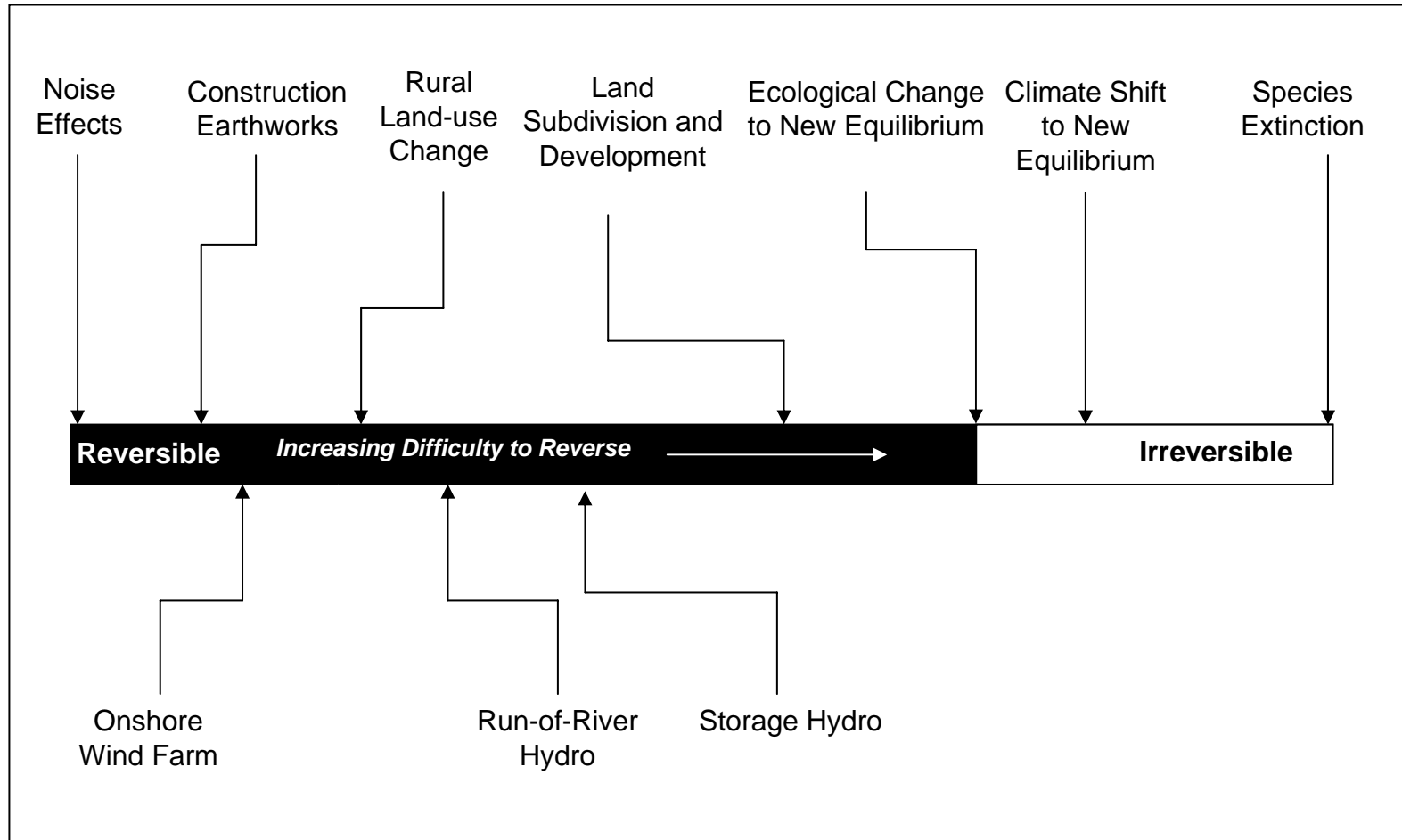
	Proposition	Finding
1	Hydro electric dams are permanent.	Hydro-electric dams are not permanent.
2	Hydro-electric projects are functionally irreversible.	Hydro electric projects are reversible.
3	The adverse effects of hydro-electric generation are permanent or functionally irreversible.	The adverse effects of hydro electric projects are reversible too.
4	Removal and restoration of storage hydro-electric projects is an unreasonable burden for future generations.	Storage hydro schemes can be expensive to remove and restore. A bond can be required under s.108A of the Resource Management Act.
5	Renewable technologies have different degrees of reversibility.	Hydro-electricity and onshore wind technologies have the same degree of reversibility: they are completely reversible.
6	The adverse effects of geothermal power development are reversible.	Geothermal power production is generally reversible except for the permanent subsidence of land.

Conclusions

- With the exception of some geothermal effects, all of the renewable technologies have the same degree of reversibility of adverse effects.
- Where the technologies differ is with respect to the ease of reversing adverse effects.



Ease of Reversal



Wording of NPS

1. Recommended rewording of Policy 3:

When considering proposals to develop new renewable electricity generation activities, decision-makers must have particular regard to the ~~relative degree~~ ease of reversibility of the adverse environmental effects associated with the proposed generation development technologies.



Condit Dam – 25MW, 38m high. White Salmon River
,WA

Wording of NPS (2)

- If it is intended to avoid collateral damage to geothermal energy developments from Policy 3, then it is recommended that the following definitions are added to the NPS:
- ***“Reversibility of adverse environmental effects”*** in relation to the abstraction, use and disposal of geothermal fluids in geothermal development areas excludes subsidence, effects on geothermal resources and effects on surface geothermal features.
- ***“Geothermal development areas”*** are geothermal resources that are identified in a Regional Plan as being suitable for geothermal energy development.

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