



Foundation for Research, Science and Technology

Tūāpapa Rangahau Pūtaiao

Environmental science
- A changing landscape

Presentation Outline

- **Context: What's driving the changes?**
 - Political landscape
 - Other key influences
- **Underneath the bonnet**
 - Science sector overhaul
- **Environmental science: A changing landscape**
 - Future directions
 - Council roles

1. Operating context

Economic growth agenda

“The driving goal of the new Government will be to **grow the New Zealand economy** in order to deliver greater prosperity, security and opportunity for all New Zealanders”

PM John Key, Dec 2008 (Speech from the Throne)

Growth agenda underpinned by...

Unlocking natural resources

“New Zealand’s **natural resources** have the potential to significantly raise our economic performance” - **PM John Key, Feb 2010**

Science & innovation

“A **high-performing public science system** which supports economic growth and delivers better value” - **PM John Key, Feb 2010**

Other relevant drivers

Water and Climate Change

“The **two most urgent issues** for MfE’s work programme”
– Letter of priorities, Hon Nick Smith, July 2009

Co-management in Treaty settlements

Waikato river – **new model of engagement** with Maori on water management options - Hon Chris Finlayson, July 2009

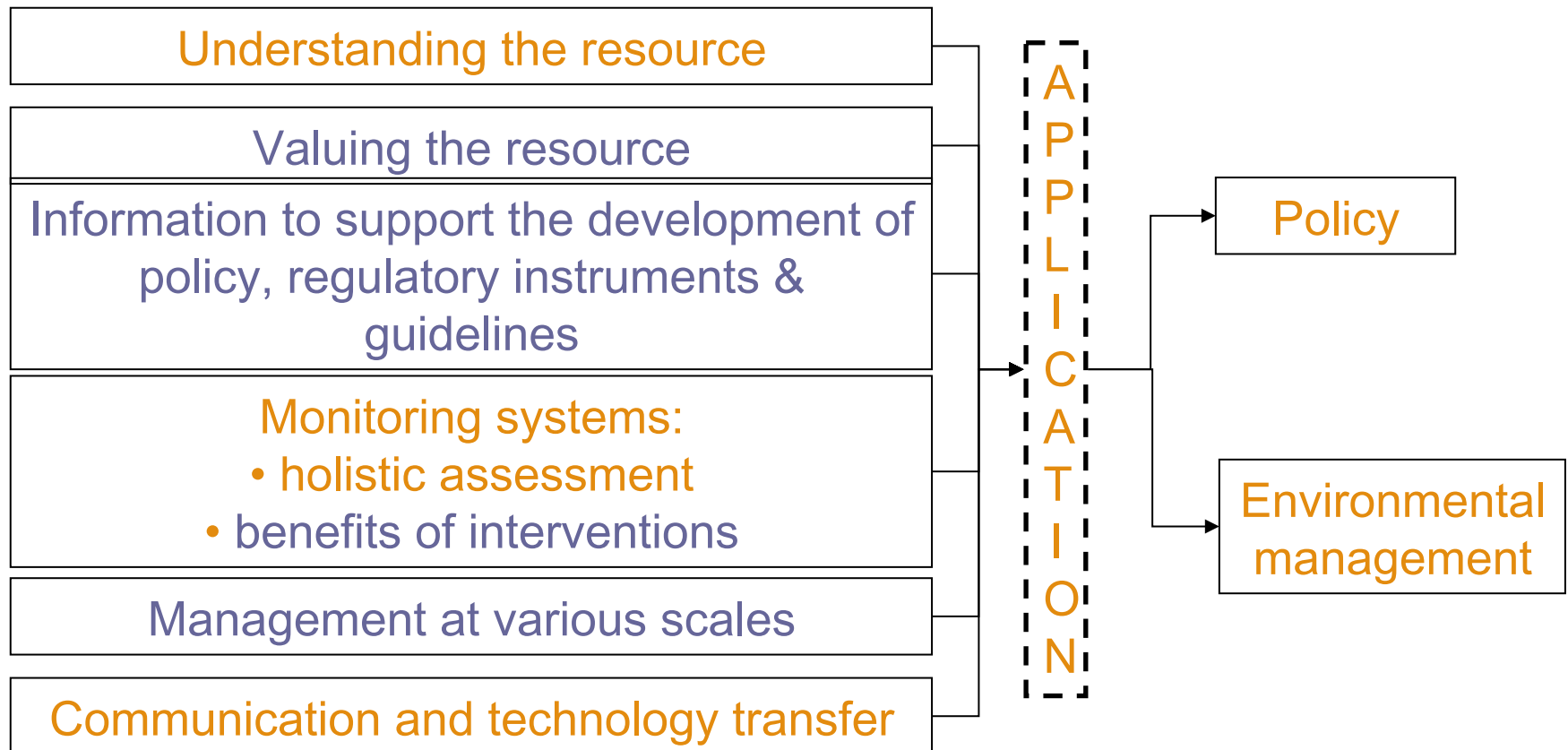
“Inside Out” government [Access to data]

“Government holds a **wealth of information and data**. I see no reason we can’t [make it available] to those outside” - Hon Bill English, Sept 2009

2. Other key influences

CSA

Improving the evidence base



Open data → Here to stay

- OECD Principles and Guidelines for Access to Research Data from Public Funding (April 2007)
- US “Open Government” initiative
- UK National Institutes of Health
- Australian National Data Service
- Data.govt.nz + DigitalNZ + NZGOAL etc

“CleanTech” opportunities

- US, China & Korea stimulus packages + G20 investment = US\$396b for “green investments”
- Singapore investing US\$700m in clean-tech research
- OECD Green Growth Strategy -> NZ taskforce (October 2010)
- NZ R&D potential -> *plant-based biofuels, sustainable agri-technologies, eco-certification, bio-remediation, etc*

Growing costs of exceeding ecological limits

- Water buy-back in Murray Darling basin: A\$3.1b
- Rotorua & Taupo lakes + Waikato river: \$450m over next 20 years
- Mapua and Tui Mine contaminated land clean up \$22m in total costs to Crown
- Water storage costs 8500x > efficiency investments.
- Air pollution = \$1.14b p/a + 1,100 premature mortality
- A UN “Stern report” for biodiversity due end 2010

Source: Australian Productivity Commission 2009

Source: NZ Govt, March 2008

Source: Hon Nick Smith, Speech to EDS 2009

Source: American Rivers 2008

Source: Fisher et al, 2007 (NIWA)

“Clean & Green” under threat?

Yale Environmental Performance Index

- NZ **1st** in the 1st year of the Index (2006) (score = 88)
- **7th** in 2008
- **15th** in 2010 (score = 73.4).
- Poor scores in GHG intensity, fisheries intensity, biodiversity loss & air emissions intensity.

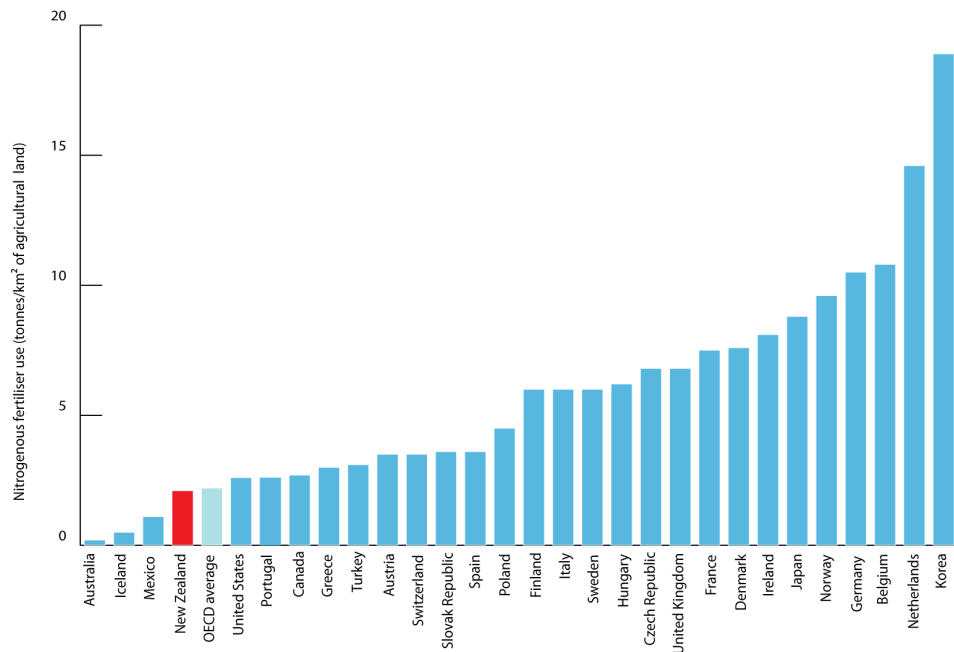
Source: Yale University, 2006, 2008 and 2010

OECD & other comparisons

- “Clean & Green” is as much a *relative* measure
- NZ tourism has green brand: rest of economy doesn't
- Low population = lower pressures (BUT intensity ramping up)

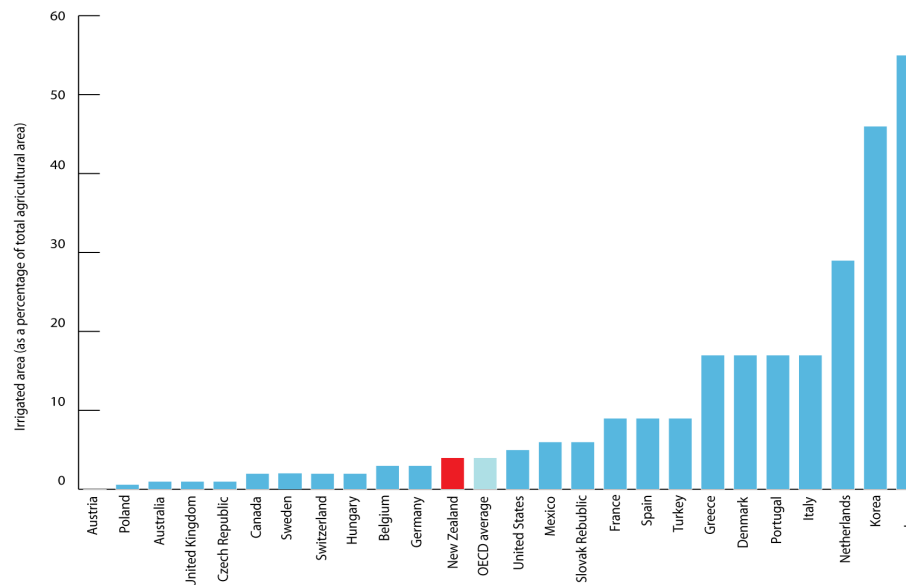
Source: John Whitehead, July 2009 (Vic Uni)

International rankings OK for now...



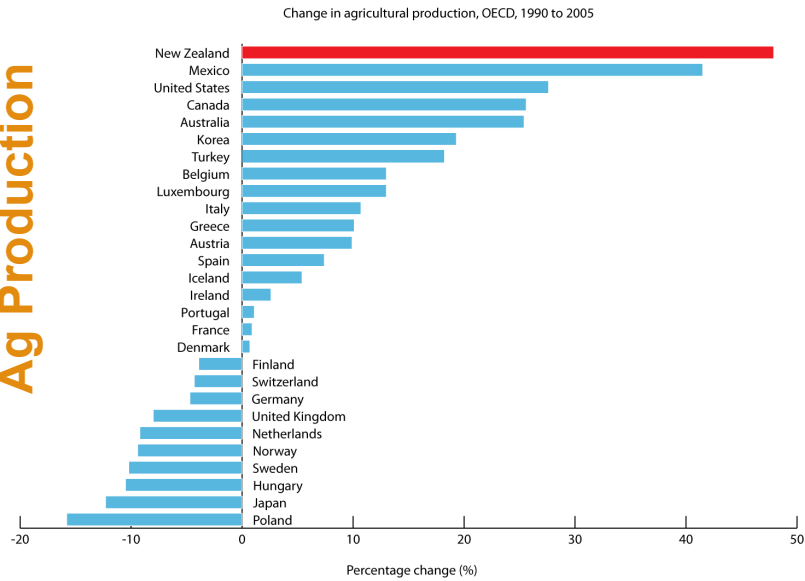
Irrigated area as share of total agricultural land - NZ on a par with other OECD countries.

Net application of N fertiliser. NZ on a par with other OECD countries.

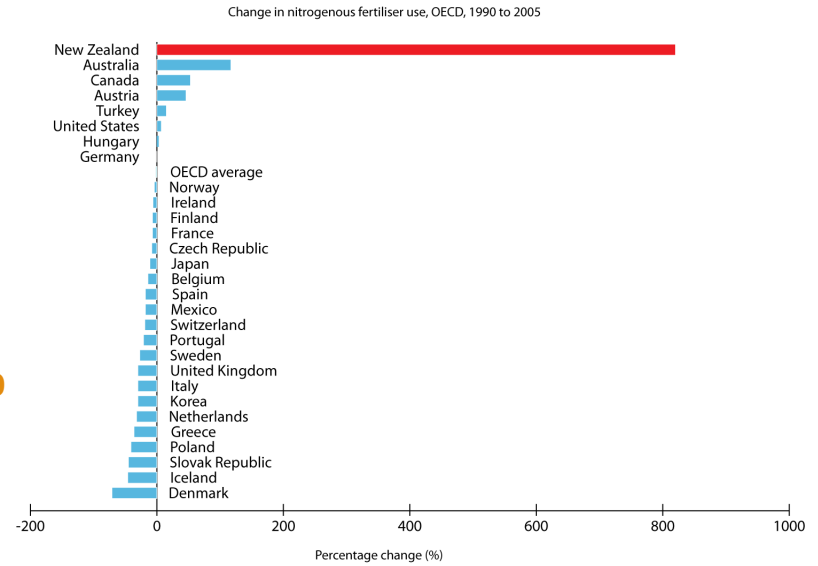


But greater pressures will show up in time

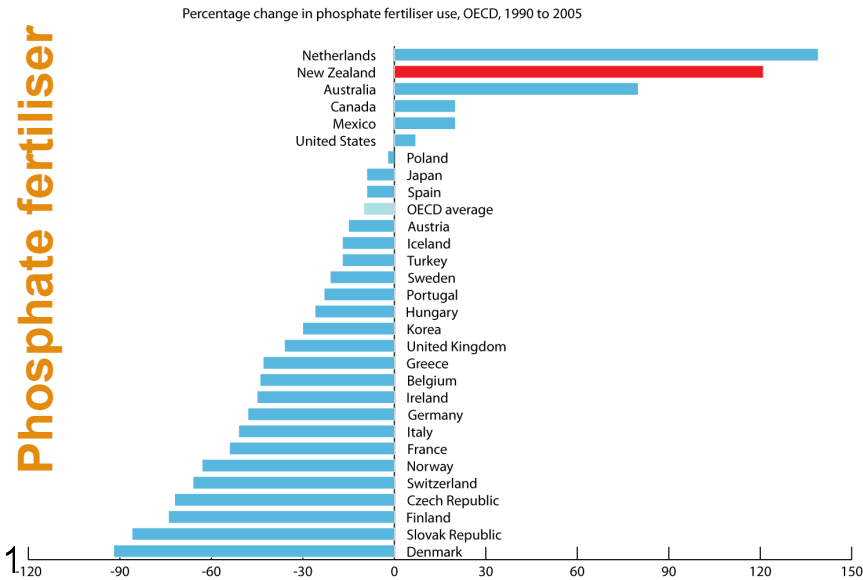
Ag Production



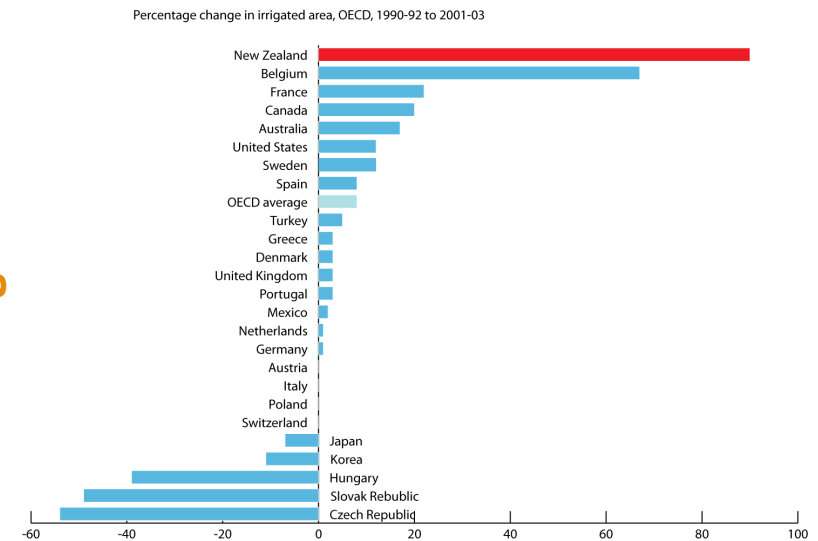
Nitrogenous Fertiliser



Phosphate fertiliser



Irrigation



Source: OECD. 2008. *OECD Environmental Data Compendium 2008: Agriculture*.

Summing up

- Science not a pure discipline
- Underpins policy & management decisions
- Helps measure the impact of interventions
- Environment & economy intrinsically linked
- Cost / benefit lens can be helpful
- Weather eye on “Clean & Green” brand value
- International rankings also of interest

3. Science sector reforms

*“Vote RST will increase its focus on improving New Zealand’s **economic performance**, through both an increased emphasis on business R&D and **linking public good research to broader economic outcomes**”*

Hon Dr Wayne Mapp, Science Priorities for Research, Science and Technology (Cabinet paper, 15 Feb 2010)

Reform process

Legislation

SCP

Describes the main CRI roles & reason for Crown ownership

CRI Boards

Government Expectations & Guidelines for SCI

- Quality of research (Panels)
- Relevance (User Panels)
- Tech. Transfer (IP)
- Efficiency
- Key Performance Indicators

↓
Review

CRI prepares SCI

- 5 Year Research Strategy and Organisational Plan

Investment, monitoring, evaluation & ownership interest function within the new Ministry

Funding

\$ Private

\$ Government Procurement

\$ Other

\$ RS&T Funding

+ Infrastructure

Biggest system change in 20 years

The Government expects to see change through:

- Greater collaboration between research agencies
- Stronger, more stable relationships with users
- Greater transfer of technology & knowledge
- Focus less on CRI bottom lines → more for NZInc
- Better value for money from research investment

But some very big challenges.....

- Requires a different mindset for all parts of system
- Greater clarity re ownership expectations
- More (& better) review & evaluation
- Strategic value and outcomes = key focus
- But science quality is still important
- Pace of change vs high expectations
- Any more funding?

4. Environmental science

Current state of play

- Research tends to be fundamental rather than applied
- Comparatively low levels of tech & knowledge transfer
- Primary end users = central and regional govt
- Small but important iwi links (co-governance regimes)
- High degree of backbone, OBIs & stable funding (only 42% is presently contestable)
- Current contract length = nearly 5.5 years
- Investment largely via CRIs (89% vs 60% FRST average)
- Science quality generally high
- Low levels of co-funding & commercialisation

New strategic direction

“Derive greater value from environmental research”

We can do this by ensuring research:

- has high strategic value
- is of high scientific quality
- is well-used and valued by research users
- creates value by underpinning other research
- grows key science capability

High-level outcomes

- More strategic & coherent science investment
- Better sectoral collaboration
- Enhanced knowledge transfer
- Strengthened open data & greater access to research
- Integrated maatauranga perspectives
- Enhanced review & evaluation

How to get there (1)

- Focus on the “strategic few”
- Less fragmentation & dilution
- Greater focus on delivering priority outcomes
- Dollars targeted to priority areas
- Focus on “mining” value → applied tools & advice
- Strategic alignment & coherence
- Common research strategies agreed to guide funding
- End user research needs supported by strategies
- Investment mapped more systematically
- Less duplication

How to get there (2)

- Leadership and collaboration
- MSI plays a key coordinating / leadership role
- Built common understanding of priority research needs
- Focus on getting better value from research
- Move beyond understanding to prediction
- No reinventing the wheel. Lots of good science offshore
- Evidence-based decisions → better outcomes

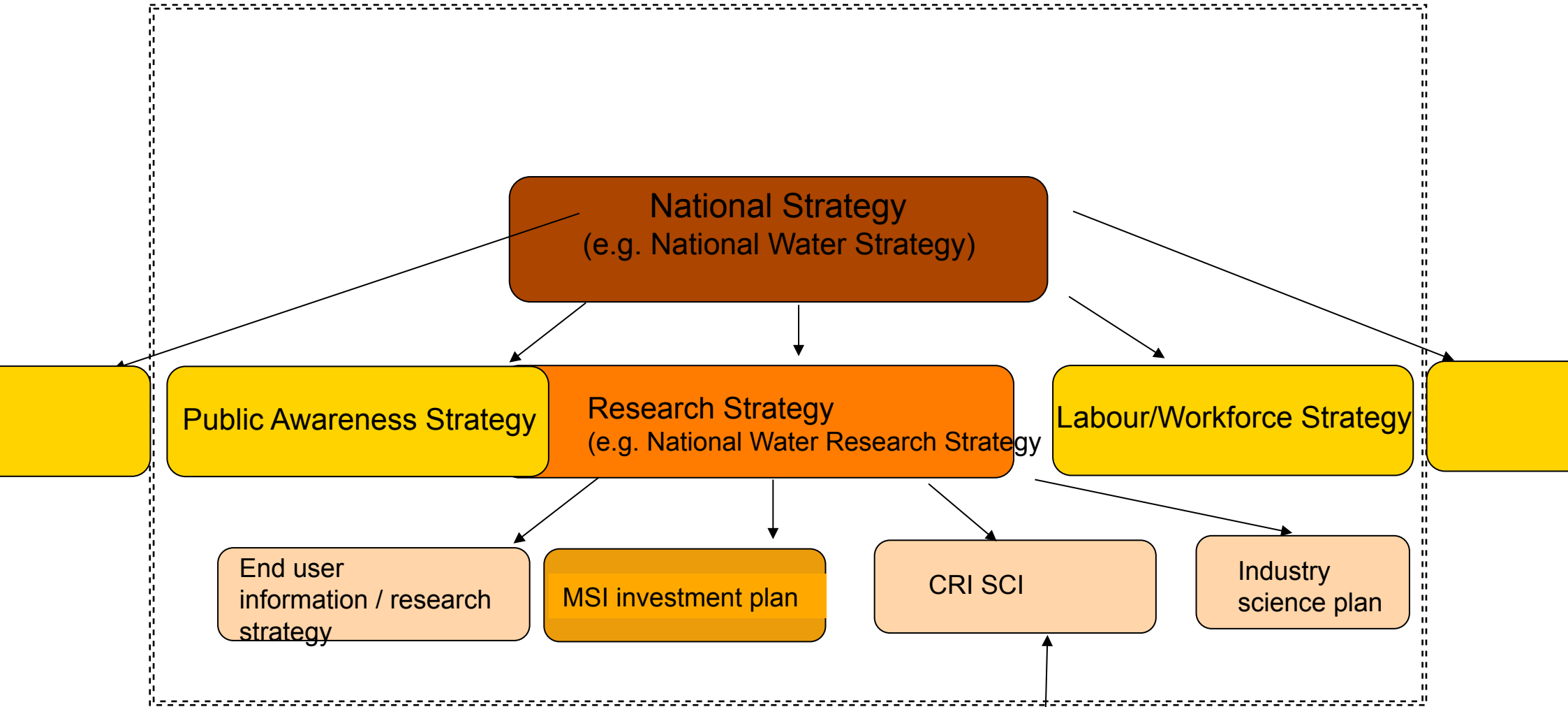
Not forgetting....

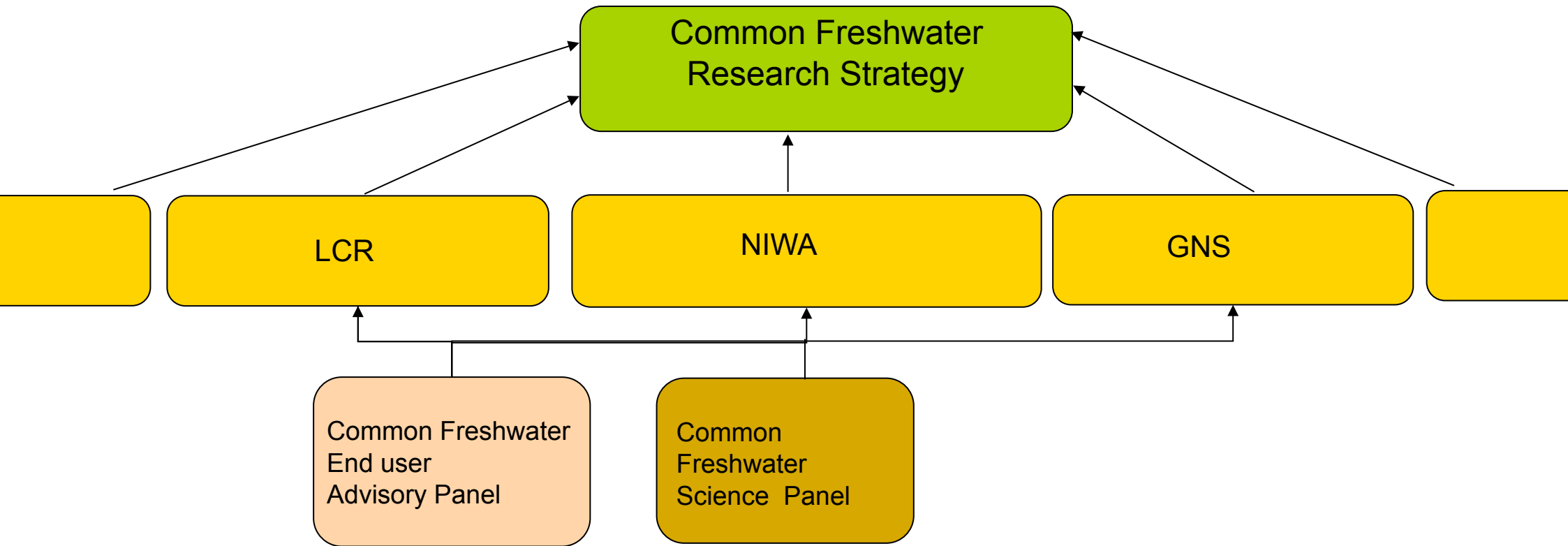
- More than just environmental science
 - Conflict about resource use - *not* just about the science
 - Apply an economic & social lens to ensure take-up
 - Integrated, real-world science findings are important
- Maatauranga Maaori
 - Environment is important to iwi
 - Not just kiatiaki, resource managers & owners too

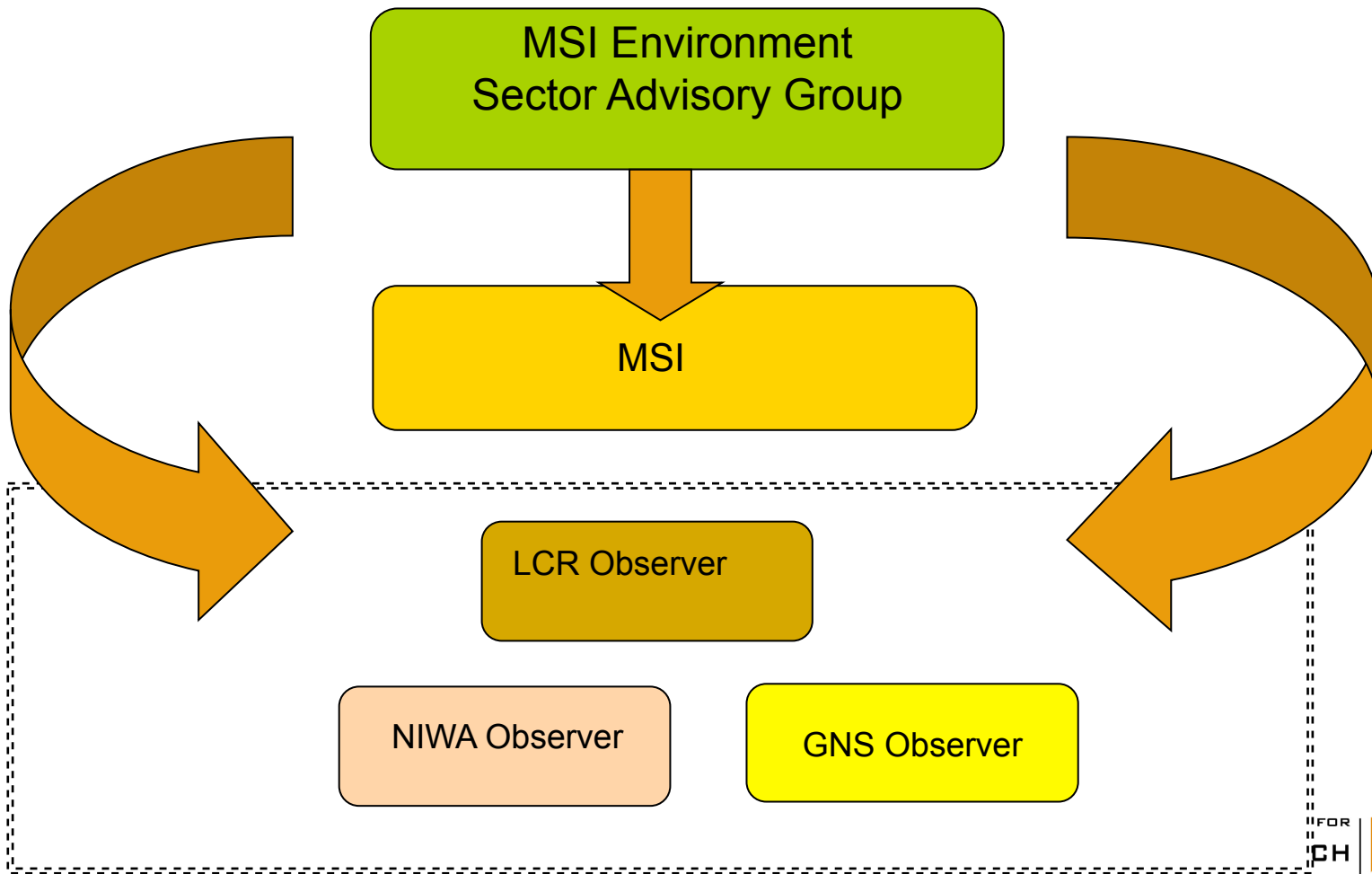
Challenges

- “Focusing on the few” means disappointing some
- Doing “more for less” is hard
- Managing the reduced levels of contestable funding
- Keeping track of investment in core funding
- Contestable vs core funding: review & evaluation of both
- Managing the system shift
(rewarding shifts in behaviour & demonstrating change)
- Merger: May take time to recover full speed

5. Council engagement







Other means of engagement

- CRI Boards
- CRI End User and Science Panels
- MSI Boards?
- MSI review panels & processes
- Stakeholder surveys (performance indicators)
- Regular dialogue with MSI
- MSI investment processes
- Engagement via CRI SCI development