

Summary of Infometrics' Modelling

Infometrics undertook 15 General Equilibrium modelling runs looking at a range of future possibilities including different:

- Carbon price scenarios
- Stringency of international obligation going forward
- Time horizons (2012 and 2025)
- Domestic policy settings
- International product prices (reflecting extent to which other countries price carbon)
- Abatement opportunities in agriculture

Bulk of runs undertaken for the ETG - some being produced for BRT & PEPANZ.

Results in a nutshell

- NZ economy continues to grow but economy performs best with
 - Lower carbon prices & a less stringent international obligation
 - Domestic policy settings that place a common price of carbon throughout the economy (uneven pricing increases costs)
 - Other countries taking effective action leading to international product prices increasing
 - Abatement opportunities being available/implemented in NZ
- The tougher the environmental target – esp if it is over and above our international obligation – the less likely we are to achieve high relative growth rates

Magnitude of results (2025 results assuming ETS)

NZ allowance (Mt/yr)	50	50	30	50
Carbon price (NZD/tonne)	\$25	\$100	\$100	\$100
Higher world product prices	N	N	N	Y
Units required to be purchased (m/ yr)	57	46.9	66.8	50.9
Private consumption (rel. to BAU)	-0.7%	-2.2%	-3.5%	-1.4%
GDP in world prices (rel. to BAU)	-0.4%	-1.5%	-2.3%	-0.1%

Putting the (highlighted in larger font) -2.2% in private consumption in perspective, the BAU increment in private consumption between now and 2025 is \$12,900 per capita. The -2.2% figure relates to a decrease in per capital income of approximately \$800 / capita in 2025. Assumptions around BAU important.

Caveats and key assumptions

1. Employment and investment remain the same in the long run – irrespective of the price of carbon
2. Sale of emission units are recycled in economy (size of govt unchanged)
3. No assessment of counter-factual (eg. BAU assumes no cost of not participating in international agreements)
4. Forestry (pre-1990 and post-1989) excluded from the model
5. No technological fixes included (in most runs) for methane and nitrous oxide – only response is to reduce production
6. Although energy specific technological change is included, the rate of this change is unaffected by the price of carbon

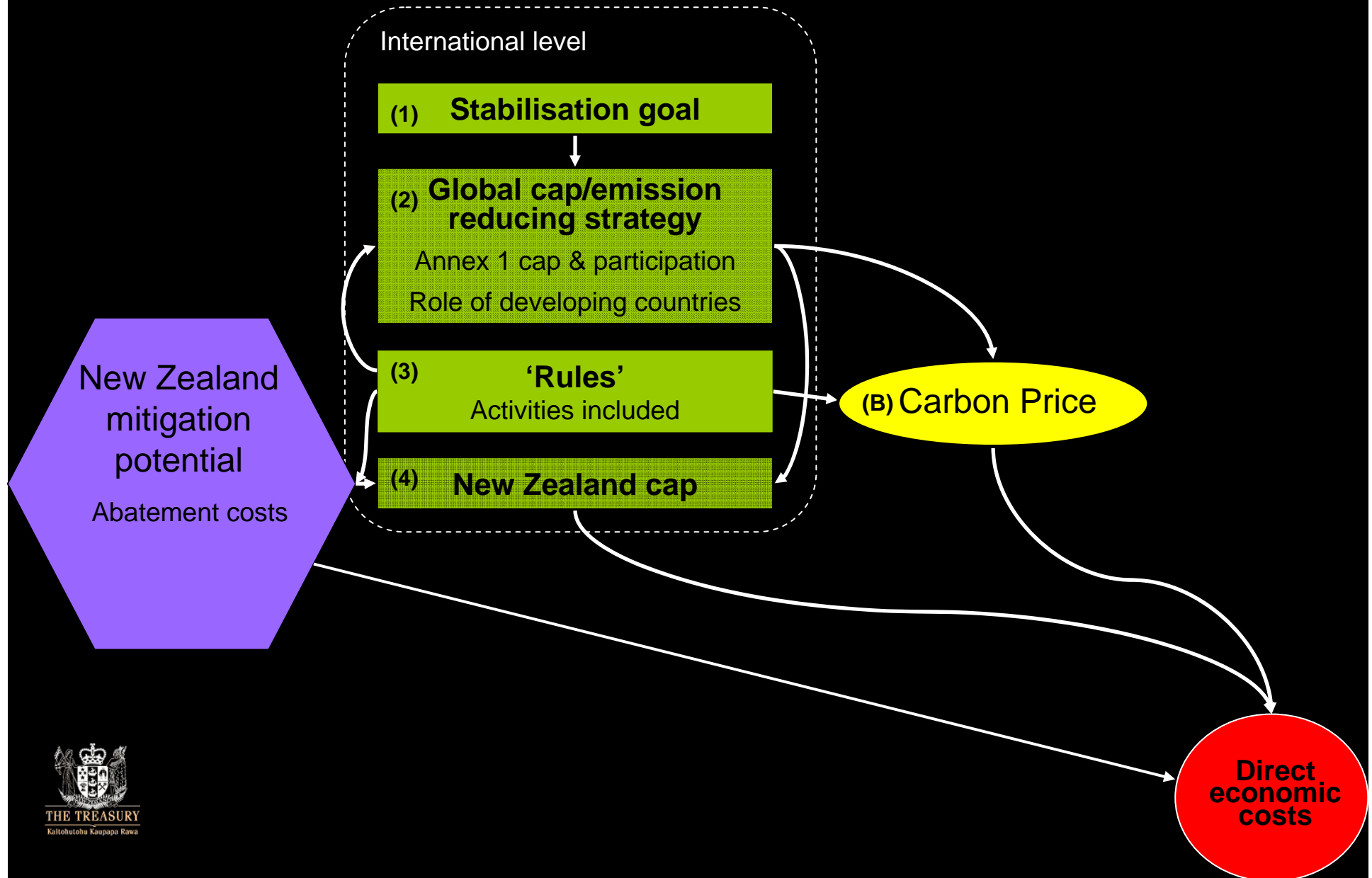
What to make of the results from an int'l viewpoint

1. Models are guides only – they rely on assumptions and simplifications of the world. Having said this
2. Accepting a further Kyoto-style target will affect the growth rate of the NZ economy but the economy will continue to grow
3. Our domestic response matters
4. Encouraging others to be part of global action is important economically – as well as being critical environmentally
5. Tougher targets increase costs of compliance with int. agreements – and presence (or otherwise) of cost-effective abatement opportunities will not affect this. NZ is a price-taker in international carbon markets.

An analytical framework for int. agreements

1. Develop economic framework to understand how the significant issues are related, and how they will influence overall costs
2. Identify the key international decisions and factors that drive costs:
 - a. New Zealand cap/target
 - b. World price of carbon
 - c. Cost of abating emissions domestically
 - d. Net emissions during the period (driven by b and c)
3. Identify analysis that is necessary to assess how specific decisions affect these factors and their financial implications

Decisions and factors which set direct costs



Key factors and decisions

a. New Zealand cap/target

- Determined by:

- Annex 1 aggregate emission reduction target
- Criteria used to disaggregate target - 'burden sharing'
 - GDP/capita; mitigation costs etc.

Analysis required

1. What Annex 1 cap is required by the science and what equitable contribution is required from non-Annex 1 countries?
2. How does New Zealand look relative to other countries when using different criteria to disaggregate target?