

Some opportunities for reducing energy demand and related GHG emissions.

- The NZ Energy Strategy 2011-2021 and Energy Efficiency and Conservation Strategy 2011-2016, include mitigation options – but are not quantified.
- Strengthen the ETS: - all electricity, heat and petrol/diesel receipts to show the amount paid for the “climate levy” under the ETS.
- Transport mitigation is a challenge with many opportunities being missed to encourage modal shifts (e.g. freight to rail and coastal shipping): develop appropriate infrastructure; avoid journeys; reduce vehicle fleet energy intensity; and reduce fuel carbon intensity.
- A low carbon-energy future for NZ is technically possible but needs strong political will to achieve.

What is the Mitigation problem?

- Mitigation is a global commons problem involving the collective use of the limited capacity of the atmosphere for GHG disposal.
- It involves managing the many uncertainties in the level of climate change impacts and in human and social systems.
- These systems respond differently to different forms of policies.
- Scientific assessment alone is unable to answer:
 - What level of harm from climate change are societies willing to tolerate and to impose on others?
 - What are the most appropriate ways to allocate the costs and benefits of mitigation among actors with varied responsibility, capability, interests, and political power.
- The IPCC Mitigation Report does not recommend particular goals but examines the technological, institutional and economic implications of selected pathways along which emissions might be mitigated to reach a variety of goals.

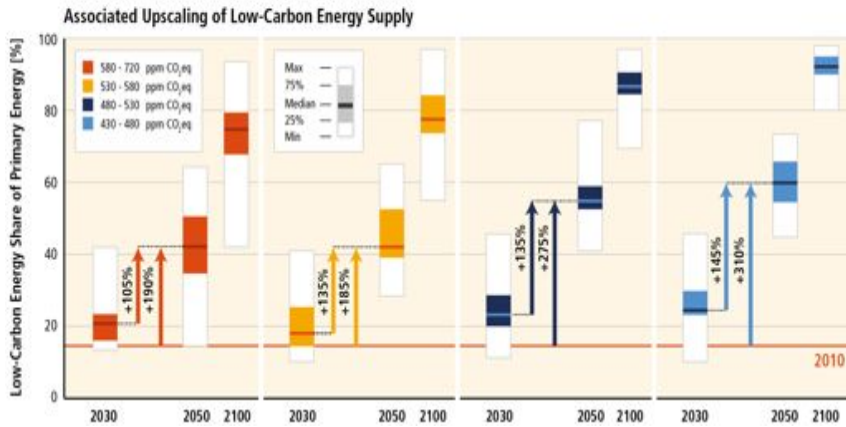
Energy Supply Mitigation Options

- **Unabated fossil fuel combustion, including natural gas and shale gas, needs to be phased out over the long-term.**
- **In the short-term, conventional natural gas replacing coal plants can provide mitigation options.**
- **Concerns against shale gas are evident from fugitive methane emissions.**
- **Nuclear energy is mature and could make an increasing contribution to low-carbon electricity supply, but a variety of barriers and risks exist.**

What options are available for policymakers?

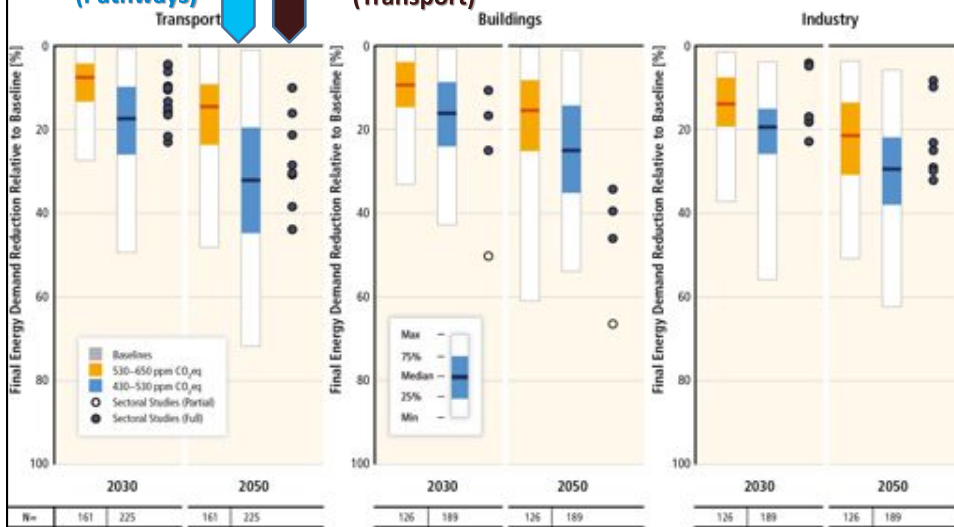
- **Sector-specific policies have historically been more widely used than economy-wide policies but there is an increased focus on policies designed to integrate multiple objectives, increase co-benefits and reduce side-effects.**
- **Regulatory approaches, technology support, and information measures are widely used and often effective.**
- **In some countries, tax-based policies specifically aimed at reducing GHG emissions have helped to weaken the link between emissions and GDP growth.**
- **The reduction of fossil fuel subsidies in various sectors can achieve GHG-related activity and emission reductions, depending on the social and economic context.**

Mitigation requires major technological and institutional changes including the upscaling of low- and zero carbon energy.



a) Energy Demand reduction from improved efficiency (% reduction 2030 and 2050 relative to baseline).

Chapter 6 (Pathways)  Chapter 8 (Transport) 



Source: Figure SPM.11

b) Switching to low- carbon energy carriers

Transport

- electricity
- hydrogen
- liquid /gaseous biofuels

Buildings

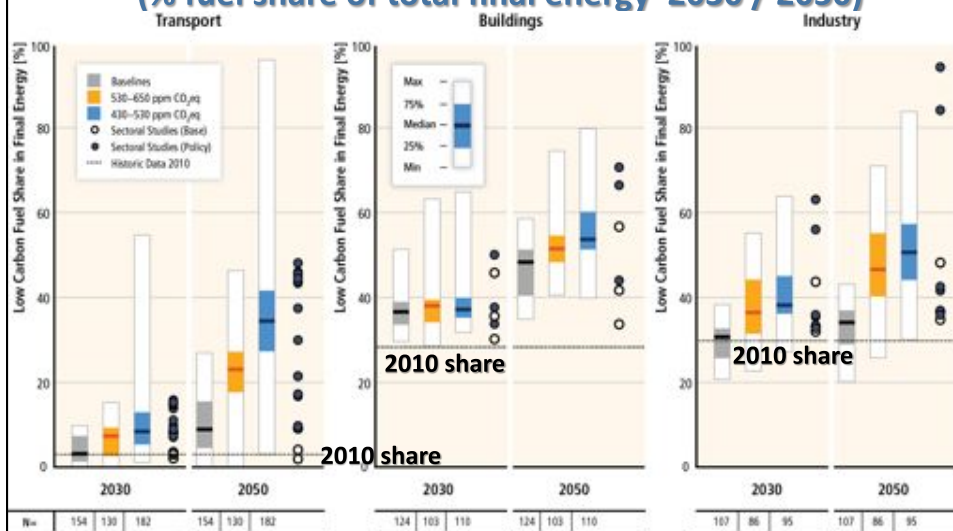
- electricity

Industry

- electricity
- heat
- hydrogen
- bioenergy

Based on direct carbon-content of individual energy carriers as well as on sector-specific considerations reflecting the underlying analysis in the energy end-use sector chapters.

b) Switching to low- carbon energy carriers (% fuel share of total final energy 2030 / 2050)



Source: Figure SPM.11