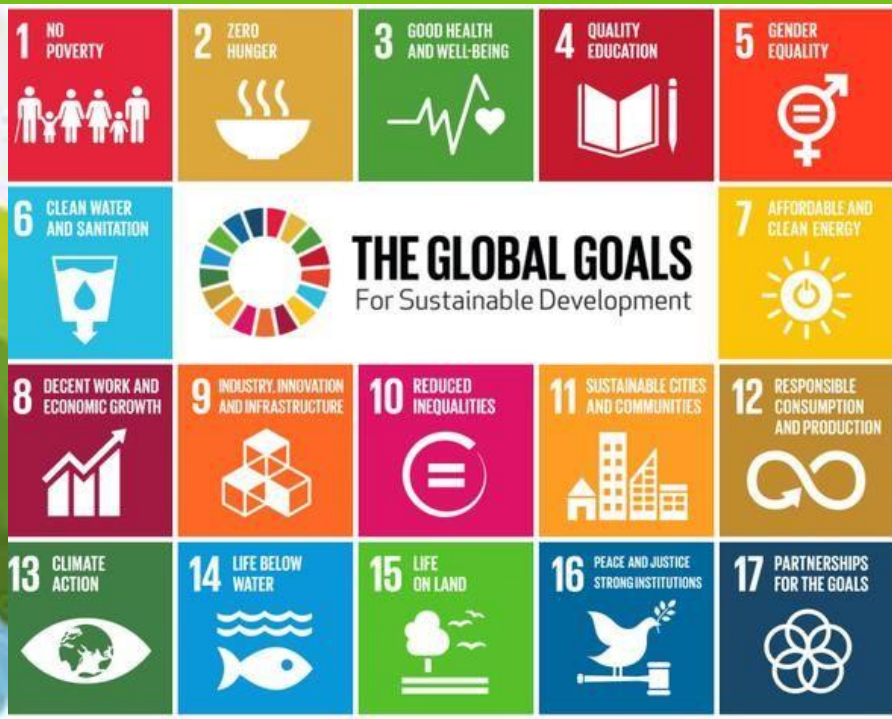
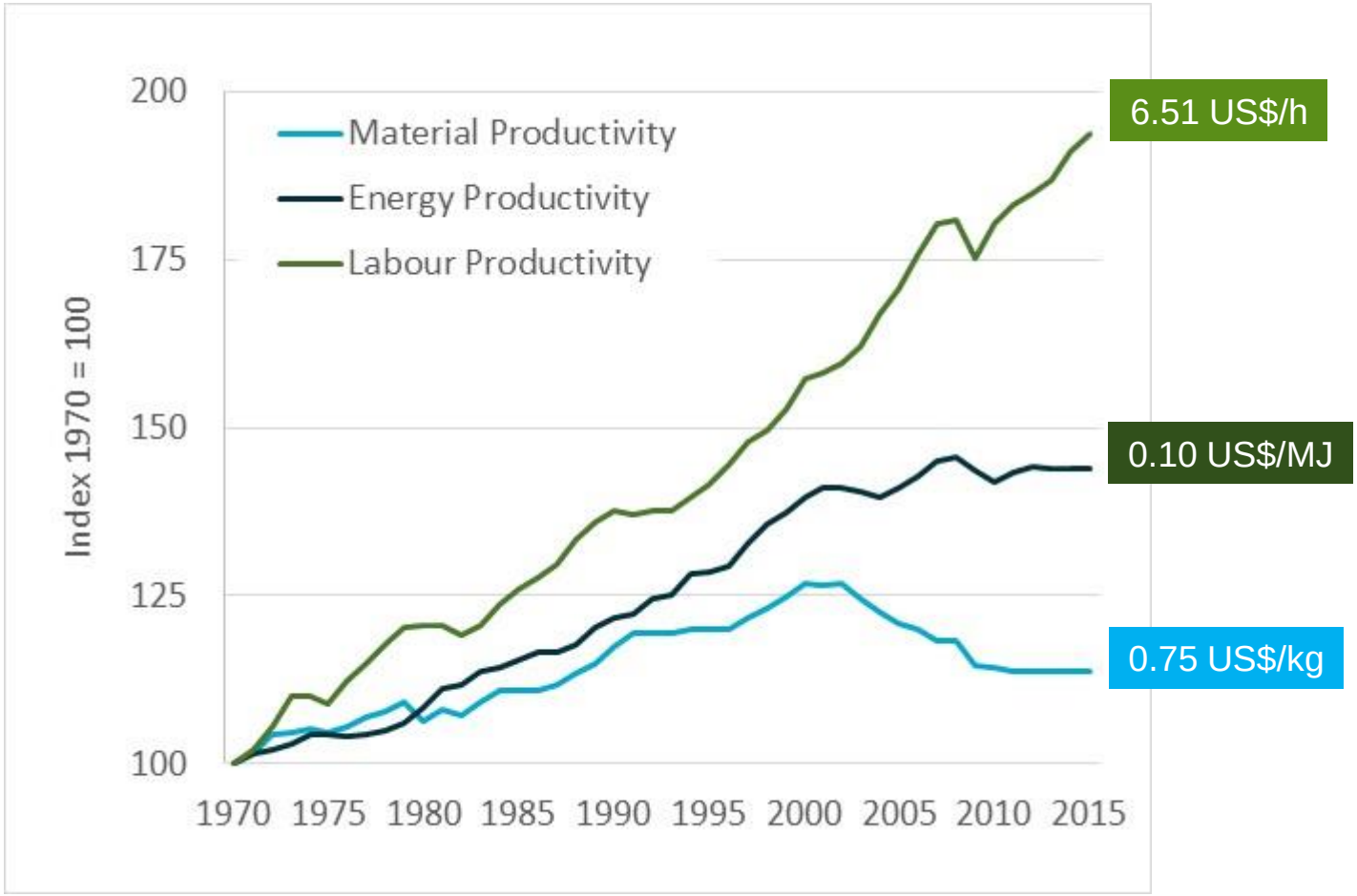



# Assessing global resource use and greenhouse gas emissions to 2030

# Decoupling hypothesis

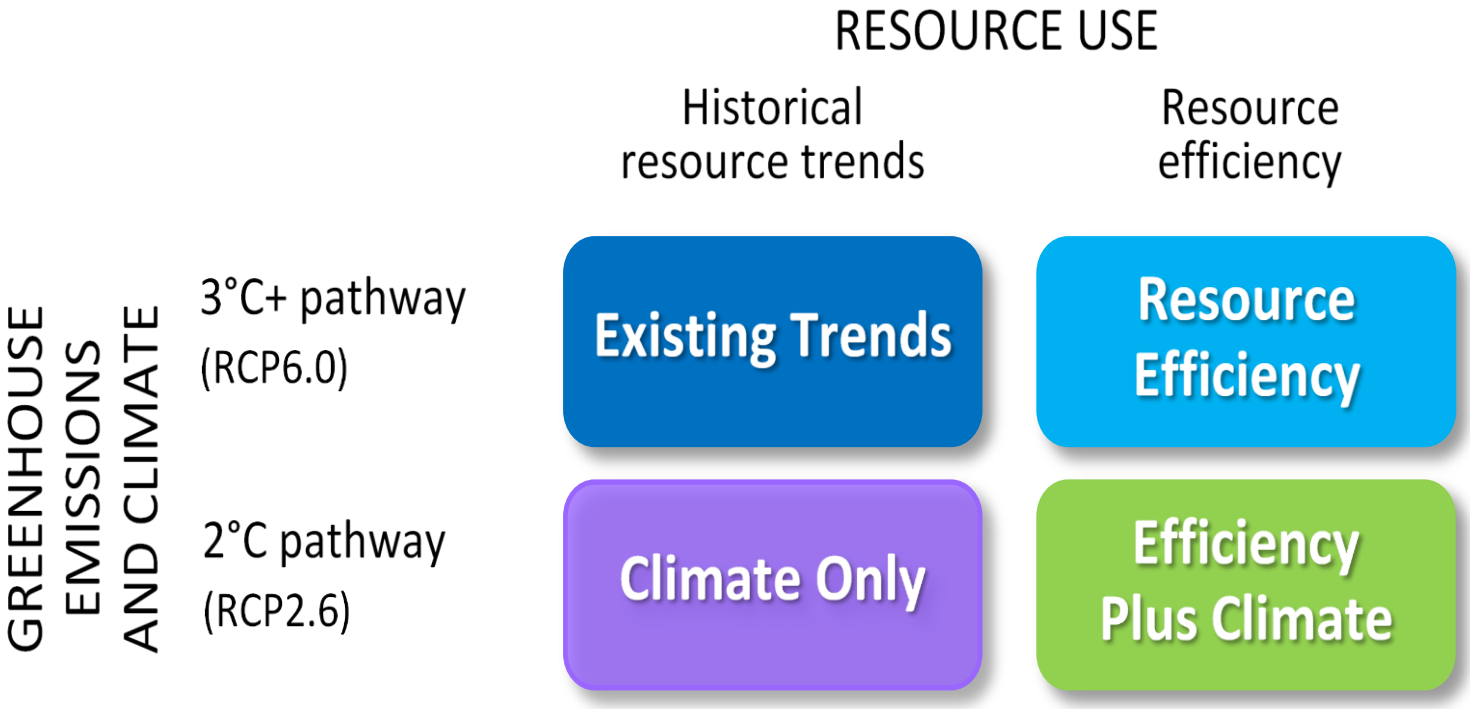
- it is possible for economic growth to continue while reducing natural resource use and environmental impacts in relative or absolute terms;
- in the short term there are many cost-effective opportunities for greater resource efficiency that will offset wholly or partially any costs incurred in this decoupling;
- in the medium to long term decoupling will generate higher economic growth than would occur on current trends of inefficient resource use, environmental destruction and climate change.

# Labour, material and energy productivity




GDP at 2005 constant prices

# Scenarios for assessing resource and climate futures



# Scenario settings

- ***Existing Trends*** is calibrated to historical trends in per capita natural resource use (biomass, fossil fuels, metal ores and non-metallic minerals), across major world regions, accounting for changes in income and GDP per capita. Greenhouse emissions reflect the Paris pledges (INDCs) to 2030, and then follow a global trajectory to 2050 that matches cumulative emissions in RCP6.0, one of four benchmark trajectories for climate forcing used by the IPCC. This emissions pathway is consistent with global temperatures increasing by around 3°C by the end of this century, and rising to around 4°C after that (Rogelj 2012).
- ***Resource Efficiency*** assumes the same climate pathway as *Existing Trends*, but introduces a package of innovations, information, incentives and regulations to promote ambitious but achievable improvements in resource efficiency, and reductions in total resource extractions.

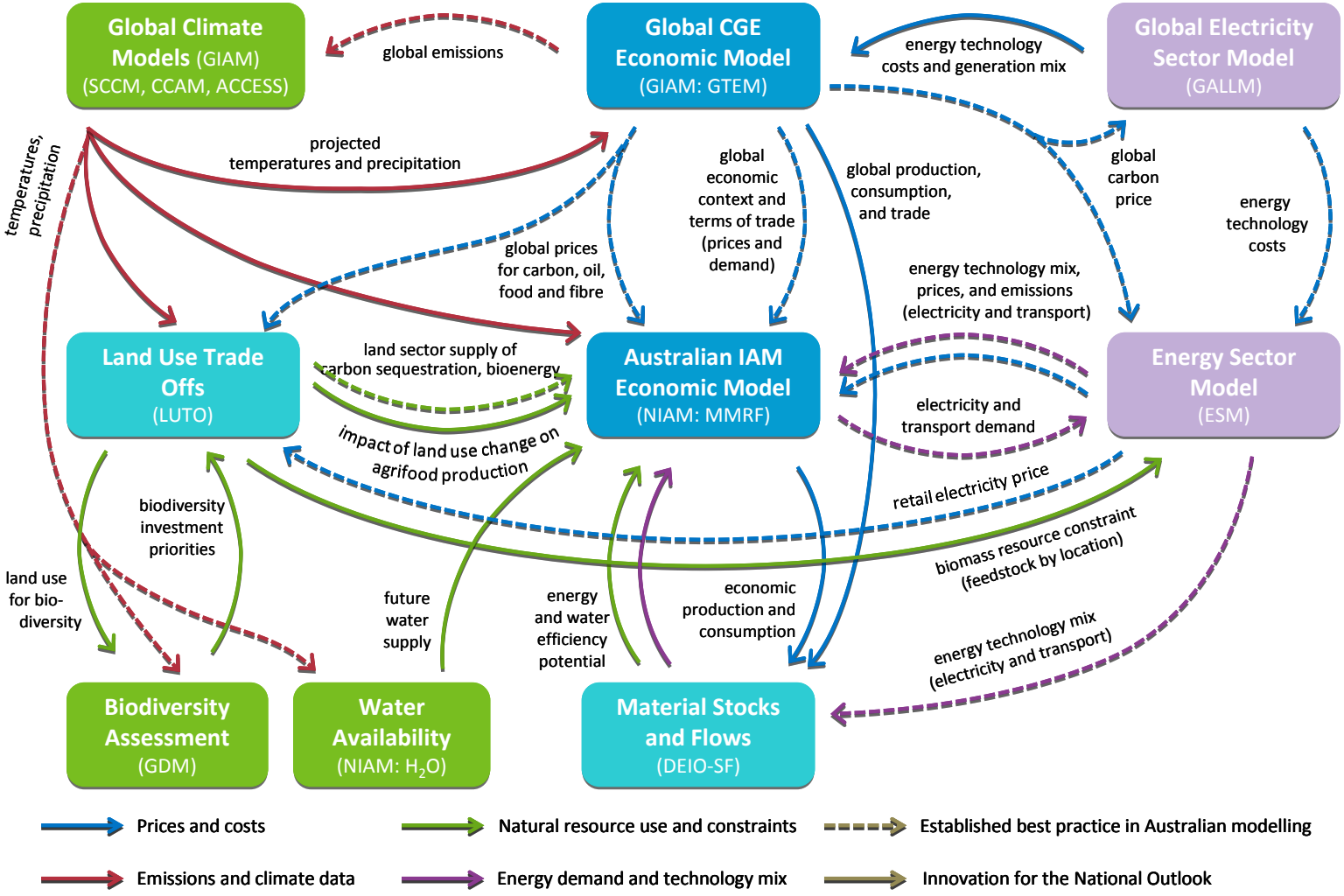
# Scenario settings

- ***Ambitious Abatement (Climate Only)*** assumes natural resource use follows historical trends, but that the world shifts decisively to a 2°C climate pathway, involving more ambitious emissions reductions from 2020. The modelling imposes stylised global abatement policies that are calibrated to achieve global emissions that match cumulative emissions in RCP2.6 to 2050. This is the lowest of the four IPCC benchmark trajectories, with around a 50:50 chance of limiting temperature increases to 2°C above pre-industrial levels.
- ***Efficiency Plus Climate*** combines the settings for the *Resource Efficiency* and Climate Only scenarios to explore potential policy interactions. We find synergies between these policies deliver larger reductions in resource use, and larger reductions in greenhouse emissions. This implies a higher chance of limiting climate change to 2°C or lower, as well as larger improvements in other environmental pressures associated with resource use.
  Economic outcomes fall between those projected for the *Resource Efficiency* and *Climate Only* scenarios, with stronger economic growth than in *Existing Trends*.

# Australian National Outlook

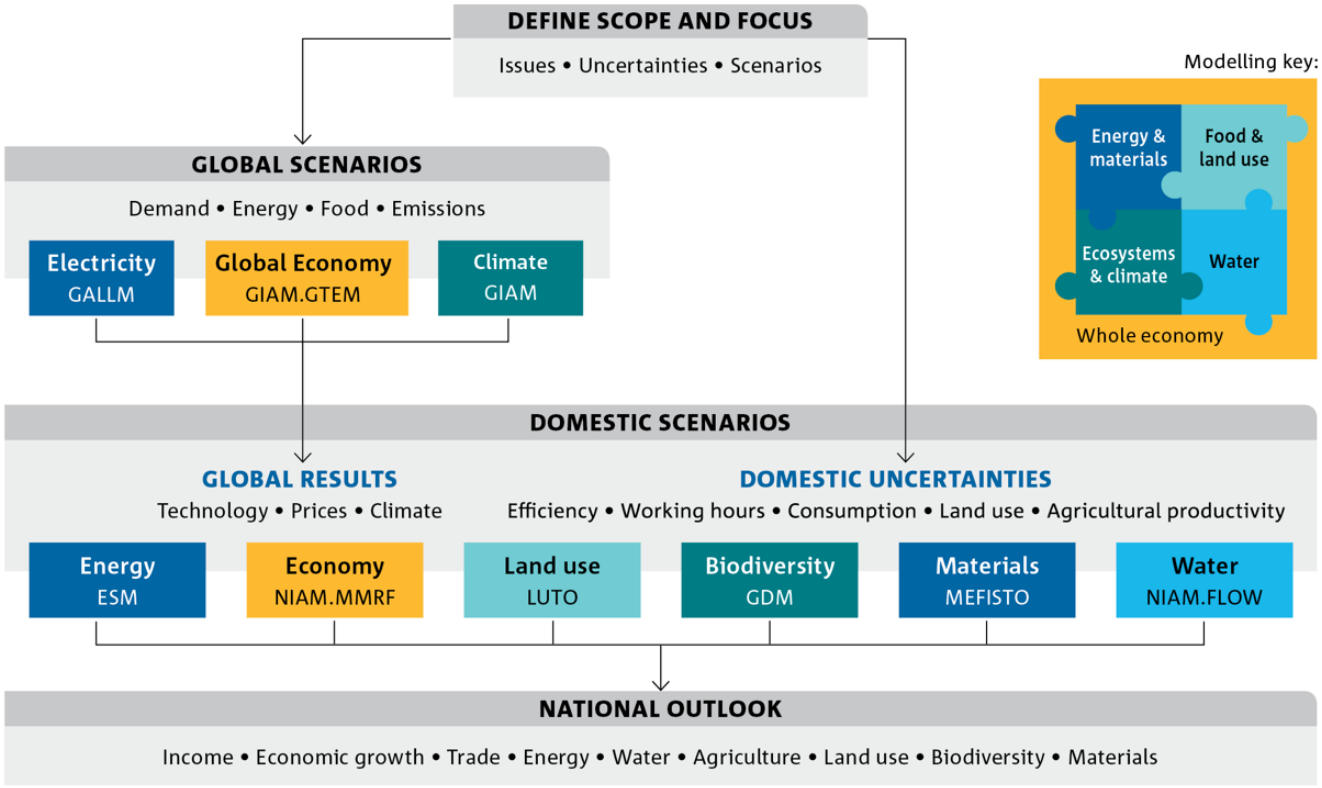
# Multi-Model Framework

… extended to include land, natural resources, and climate impacts



# **We link nine national and global models** to provide a rich picture of potential futures

FIGURE 3 **OVERVIEW OF THE NATIONAL OUTLOOK ANALYTICAL FRAMEWORK, AND PROJECT FLOW**

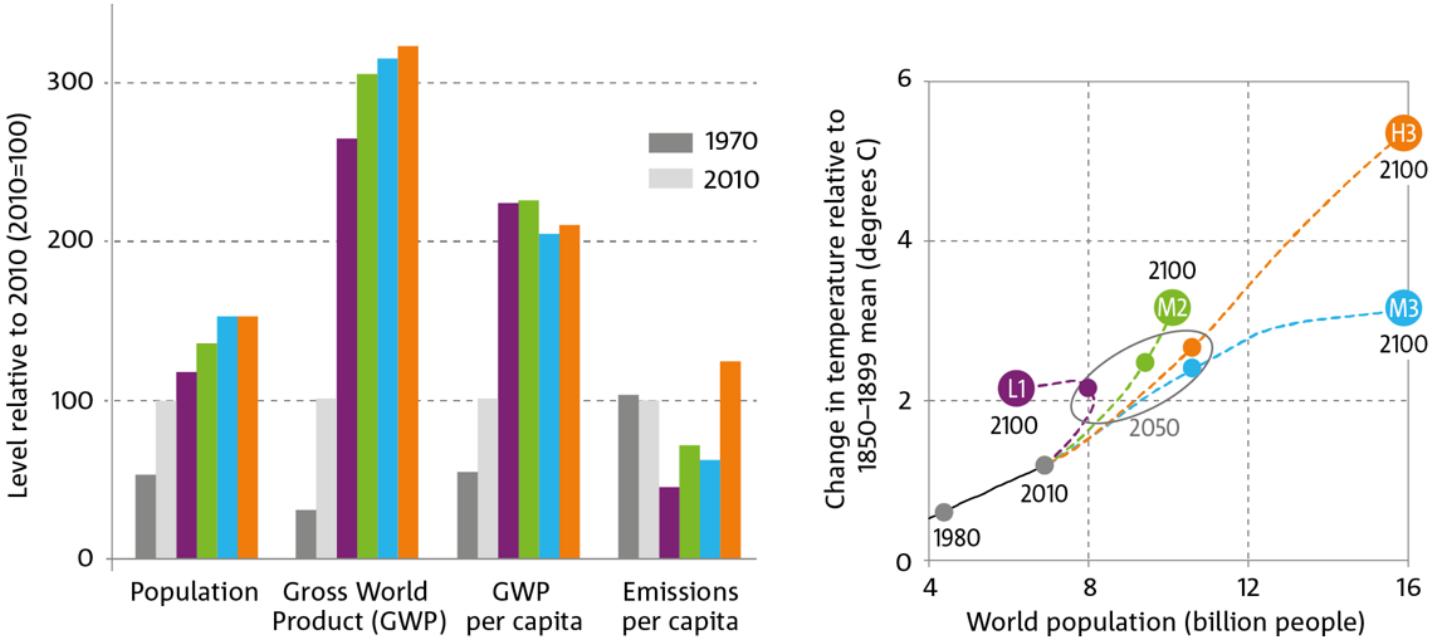



Source: Hatfield-Dodds et al. (2015) *Australian National Outlook 2015: Economic activity, resource use, environmental performance and living standards, 1970-2050.*

The *National Outlook* is the most integrated and evidence-based national scenario assessment of these issues yet attempted. The analysis uses nine linked models to explore global and national trends and uncertainties.

# Key results for the global context scenarios

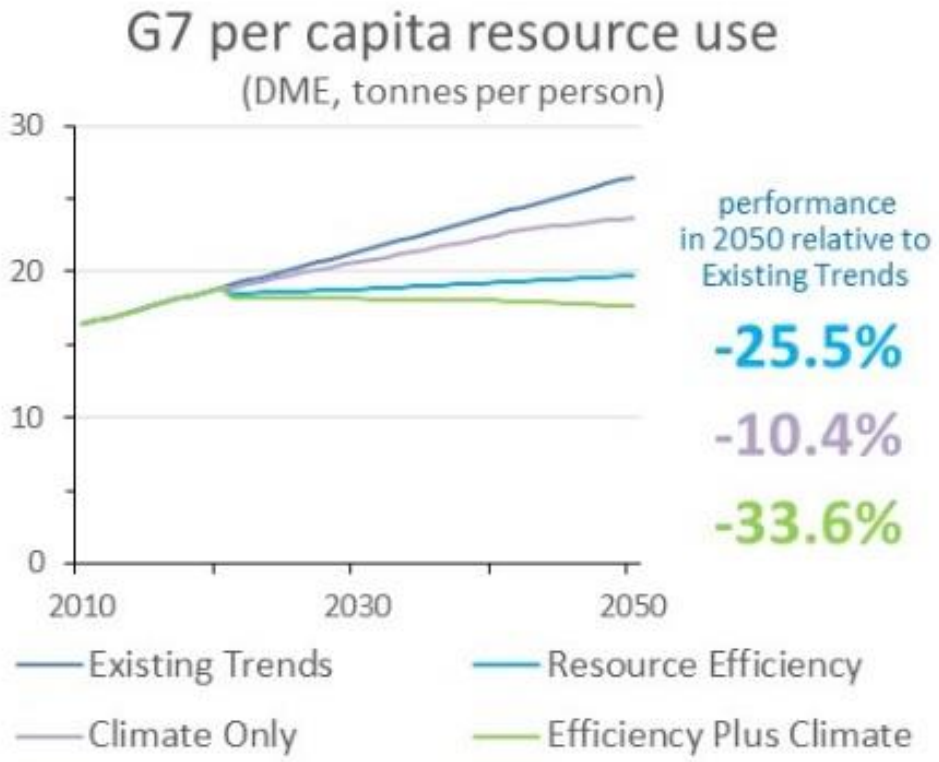
FIGURE 26 **KEY INDICATORS FOR THE FOUR GLOBAL CONTEXT SCENARIOS, 1970, 2010, 2050, OR 1980-2100**




The different levels of global abatement effort have a significant impact on per capita emissions in 2050, but the full climate implications – and impacts – of the different emissions trajectories do not occur until later in the century.

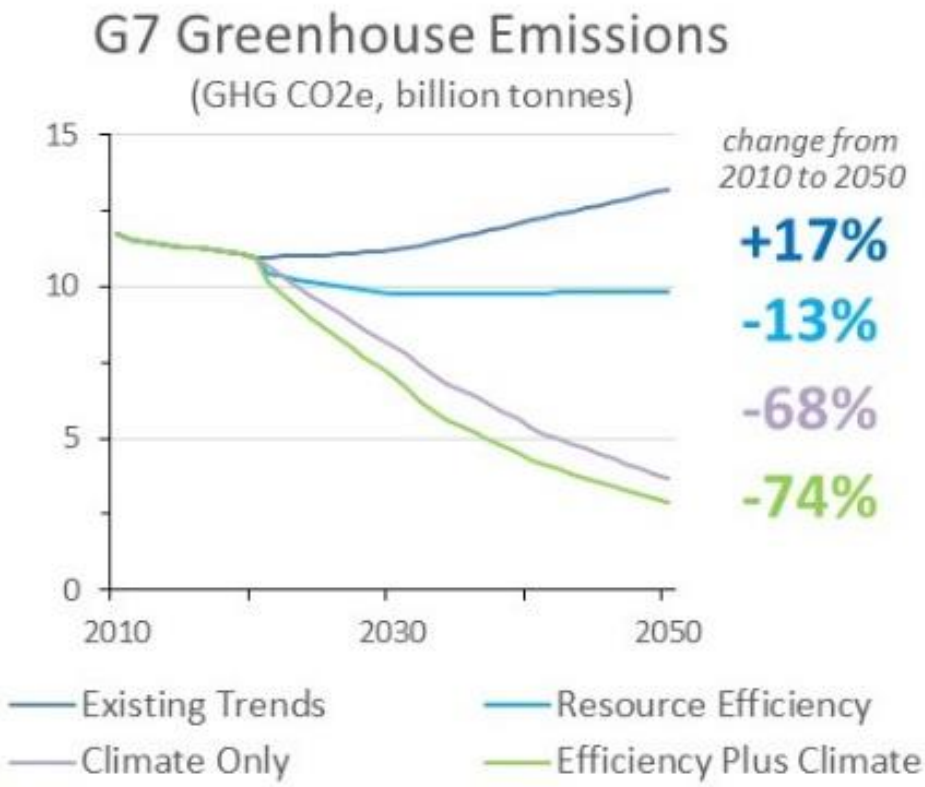
Source: Hatfield-Dodds et al. (2015) *Australian National Outlook 2015: Economic activity, resource use, environmental performance and living standards, 1970-2050*

# G7 Resource efficiency



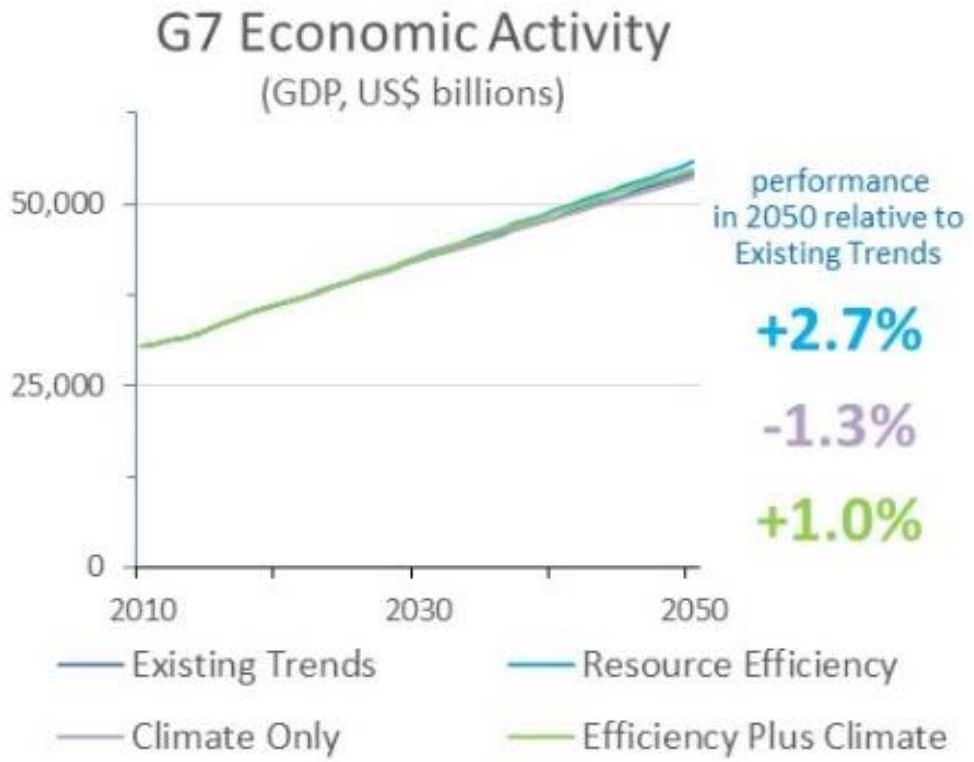

**Source: CSIRO and IIASA, 2016**

# G7 Decarbonization



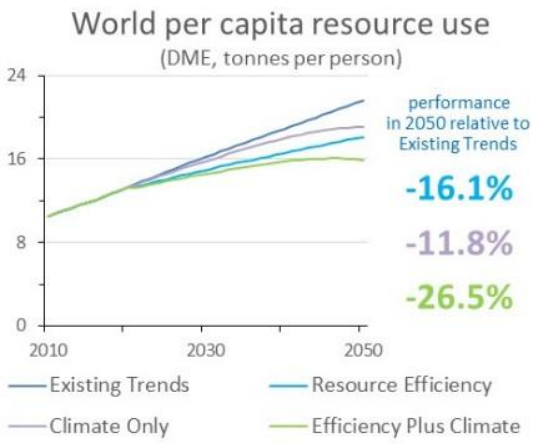

**Source: CSIRO and IIASA, 2016**

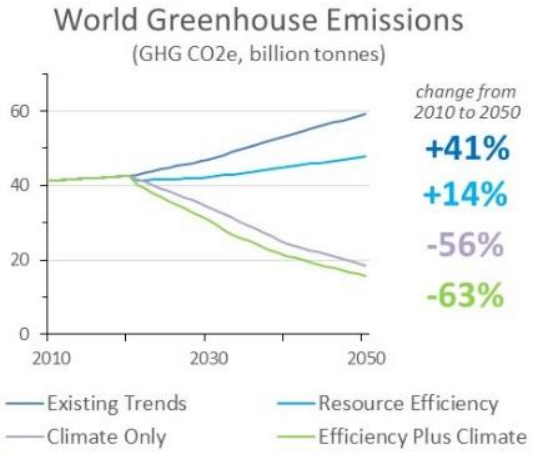
# G7 Economic growth

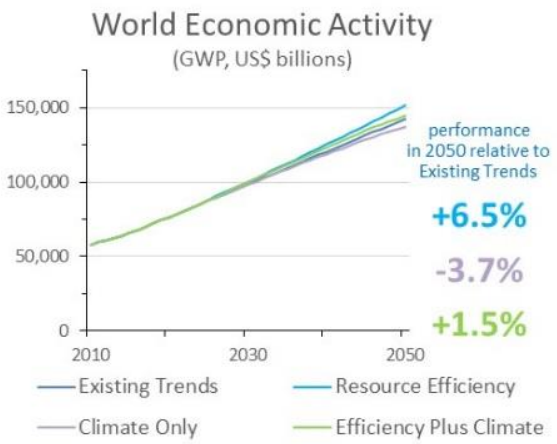



**Source: CSIRO and IIASA, 2016**

# Global scenarios




**Source: CSIRO and IIASA, 2016**

# Key findings

- substantial potential to achieve economically attractive resource efficiency, providing win-win outcomes that reduce environmental pressure while improving income and boosting economic growth in the group of 7 countries and globally
- significant co-benefits for climate mitigation
- projections can be treated as a reasonable minimum (or 'lower bound') estimate
- the level and mix of economic and environmental benefits achieved will depend on the detail of the policies and approaches implemented
- attention will be required to develop and test a smart and practical package of resource efficiency measures

# Thank you

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