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Two tons per person (not twenty): Climate policy and economic change for a low-carbon Australia

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College of Asia and the Pacific
The Australian National University

University of Adelaide, 2009

Australian climate change policy

- Kyoto engagement, but 2002 decision against ratification
- Kyoto ratification 2007 under Rudd Labour government
  - On track to 108% target
- Garnaut Climate Change Review 2008
  - Commissioned by now PM Rudd

- Emissions trading scheme design and legislation 2008-09
  - Debates over free permits, target levels, start date, …
- Financial crisis / recession – climate policy interaction ??

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Australia the developed country most at risk

- Climate hot, dry, variable already
- Agriculture diminished
  - Growing areas, productivity reduced
  - Irrigated agriculture in Murray-Darling Basin may disappear
- Settlements under pressure
  - Urban water supply, coastal infrastructure
- Natural icons and ecosystems destroyed
  - Great Barrier Reef, Kakadu wetlands, alpine areas
- Flow-on effects from impacts in other countries
  - Australia in a region of developing countries
  - Trade, migration, security

Limiting climate change impacts and risks: The global decarbonisation challenge

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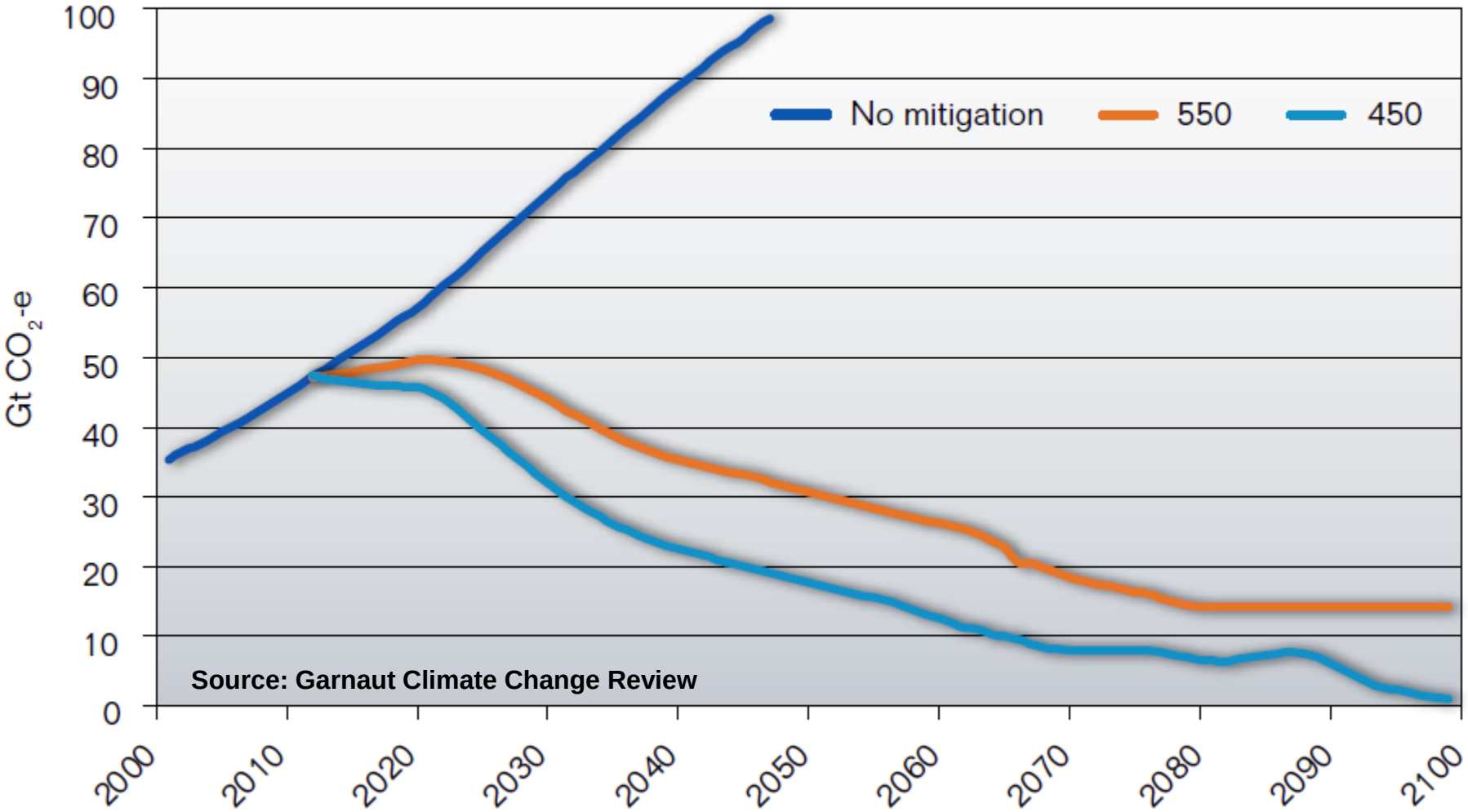
Figure 9.3 Emissions trajectories for the no-mitigation, 550 and 450 scenarios, 2000–2100



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Costs and benefits of mitigation for Australia

- Quantifiable economic benefit from avoided climate change are large … plus:
- Reduced risk of catastrophic impacts
- Reduced losses of non-market values

- Mitigation cost is small
  - ~0.1% of GDP per year (modelling: treasury.gov.au)
- Australia a low-carbon economy by mid-century
  - Renewables, Biosequestration, carbon capture and storage?

- Australia a buyer of emissions rights

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Implications for policy

- Australia's interest is in strong global mitigation (450)

  …with Australia playing its proportionate role
  - This is now government position
  - big difference to earlier emphasis on Australia's fossil fuel interests

- International dimension of critical importance
  - Developing countries must be comprehensively engaged
  - But developed countries initially have to foot most of the costs
  - Bilateral engagement with developing countries: Indonesia, PNG

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Differentiation of commitments: moving to equal per capita

- Population probably the only viable guiding principle
- 'Contraction and convergence':
  gradual move to equal per capita emissions entitlements
- Debates over equity:
  how fast to converge?
  Taking into account historical responsibility?

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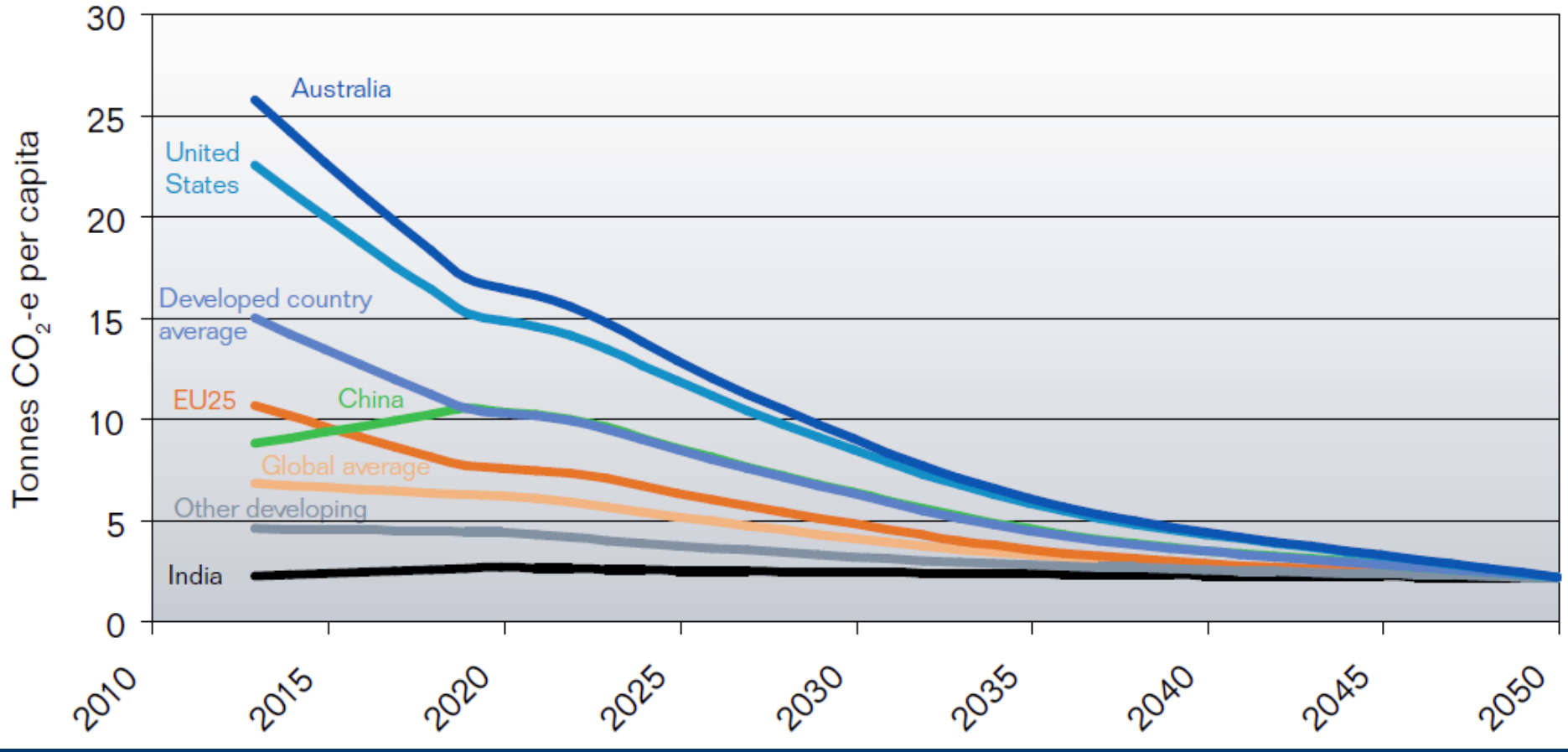
Modified contraction and convergence, Garnaut Review model

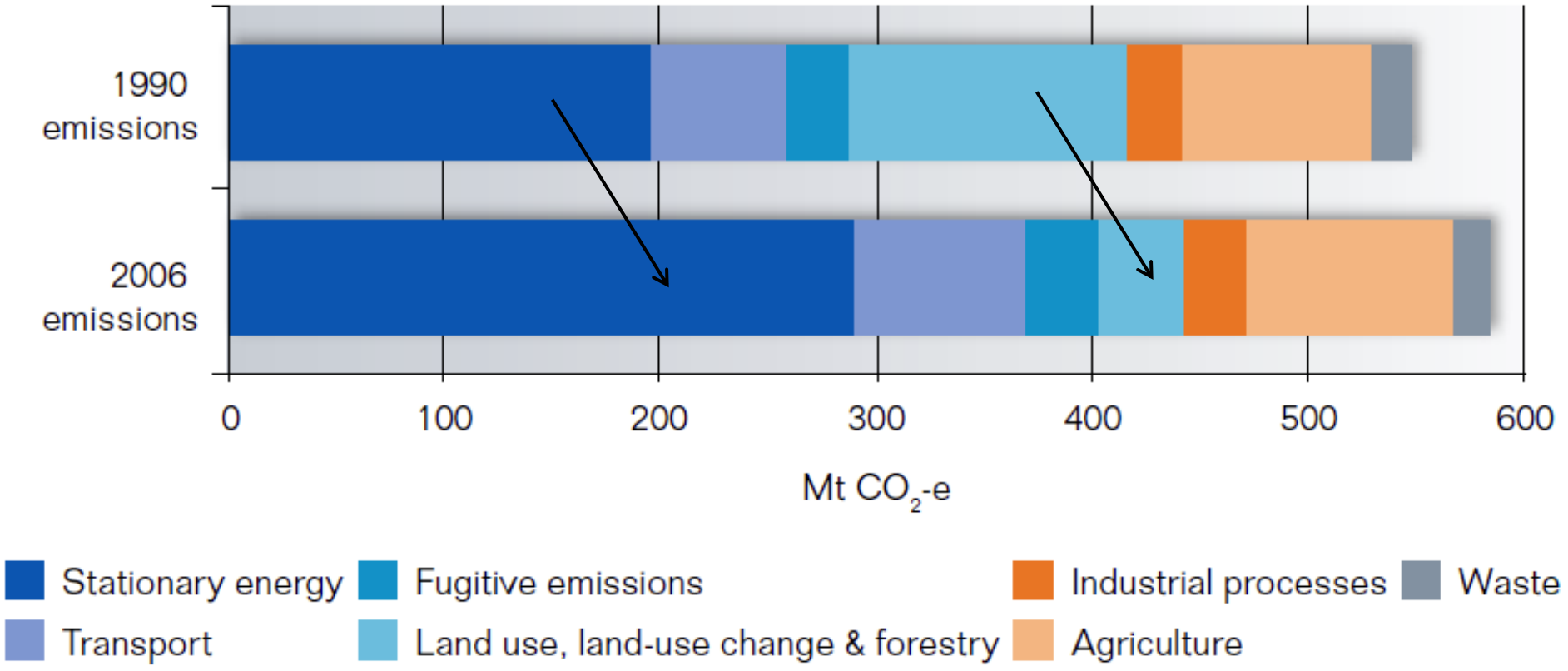
Figure 9.5 Per capita emissions entitlements for the 450 scenario, 2012–2050



Source: Garnaut Climate Change Review

Australia's emissions profile and trend

Figure 7.2 Greenhouse gas emissions by sector, 1990 and 2006



Source: Garnaut Climate Change Review

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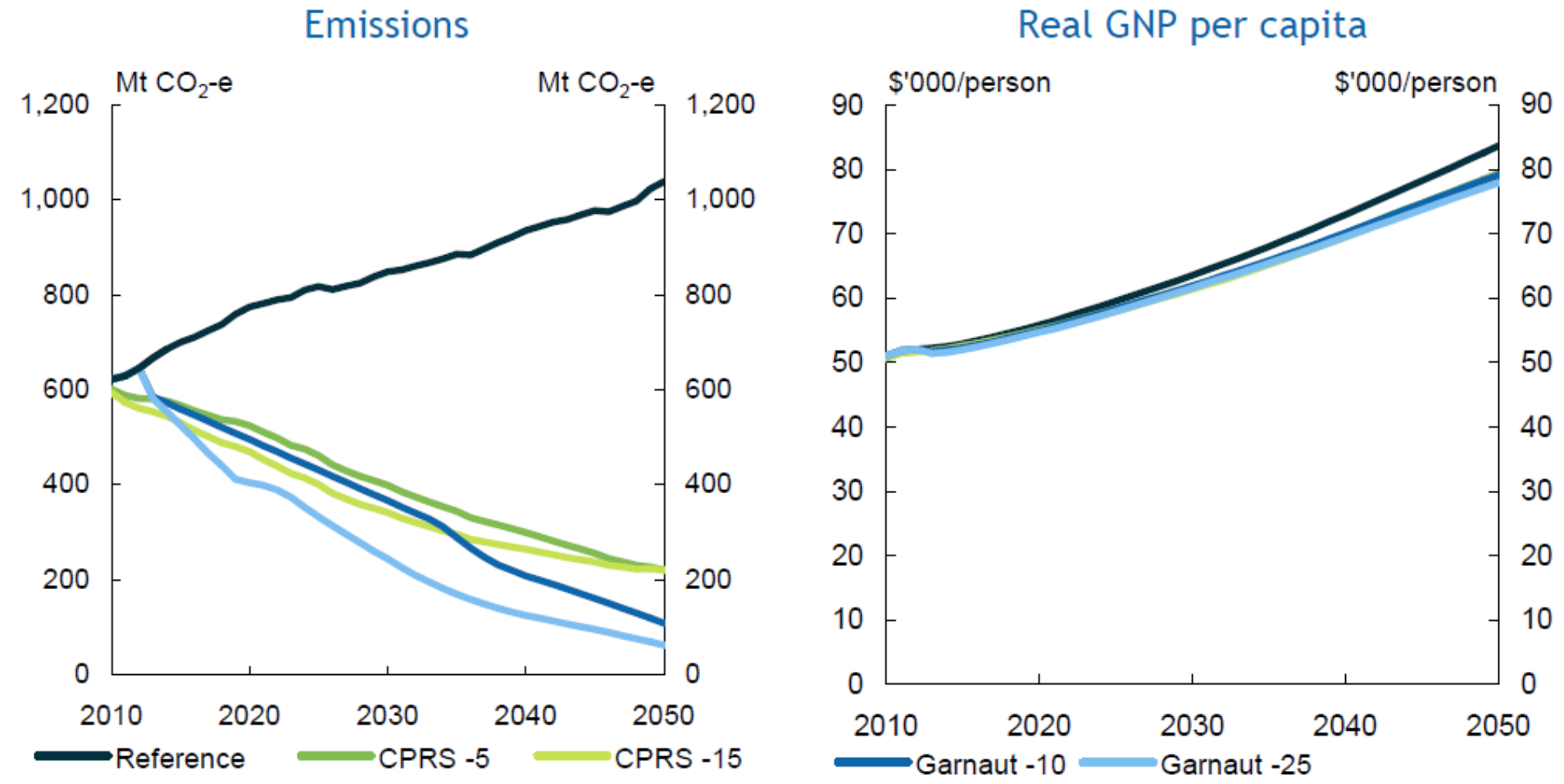
Cutting carbon emissions, keeping Australia's economy growing

Chart 1: Five pathways for Australian emissions and GNP



Source: Treasury, Australia's low pollution future, 2008

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Economic instruments for a cost-effective outcome

- Carbon pricing the principal instrument
  - Equal marginal cost for cost effectiveness
  - Market discovers lowest cost abatement options
  - Emissions trading or emissions tax
  - Equivalent policies in non-covered sectors
- Technology support
  - Externalities in RD&D justify government subsidies
  - Renewable energy targets … ? over efficiency but attractive for other reasons
- Standards and regulation
  - Appropriate where market instruments do not work
  - Housing; transport; agriculture?

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Australia's emissions targets (relative to 2000=1990)

GARNAUT REVIEW RECOMMENDATIONS	CURRENT GOVERNMENT POLICY
2020: — 5% unconditional — 10% if int'l agreement 550-compatible — 25% if int'l agreement 450-compatible	2020: —5% unconditional up to —15% if international agreement New: —25% if strong '450' intl agreement
2050: —80% for 550 agreement —90% for 450 agreement	2050: —60% To be reviewed if strong international agreement

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Are these targets weak?

- Current emissions ~ 7% above 1990/2000

- By 2020 +20% or more without policy action
  - running out of land-use options
- Australia's population growth ~1.7% growth per year
  - 1990 to 2010: 27% increase in population

- Reductions as per Garnaut Review model, 450 agreement, 2020 cf 2000:
  - Absolute: Australia – 25%, Europe – 30%
  - Per person: Australia – 30%, Europe – 17%

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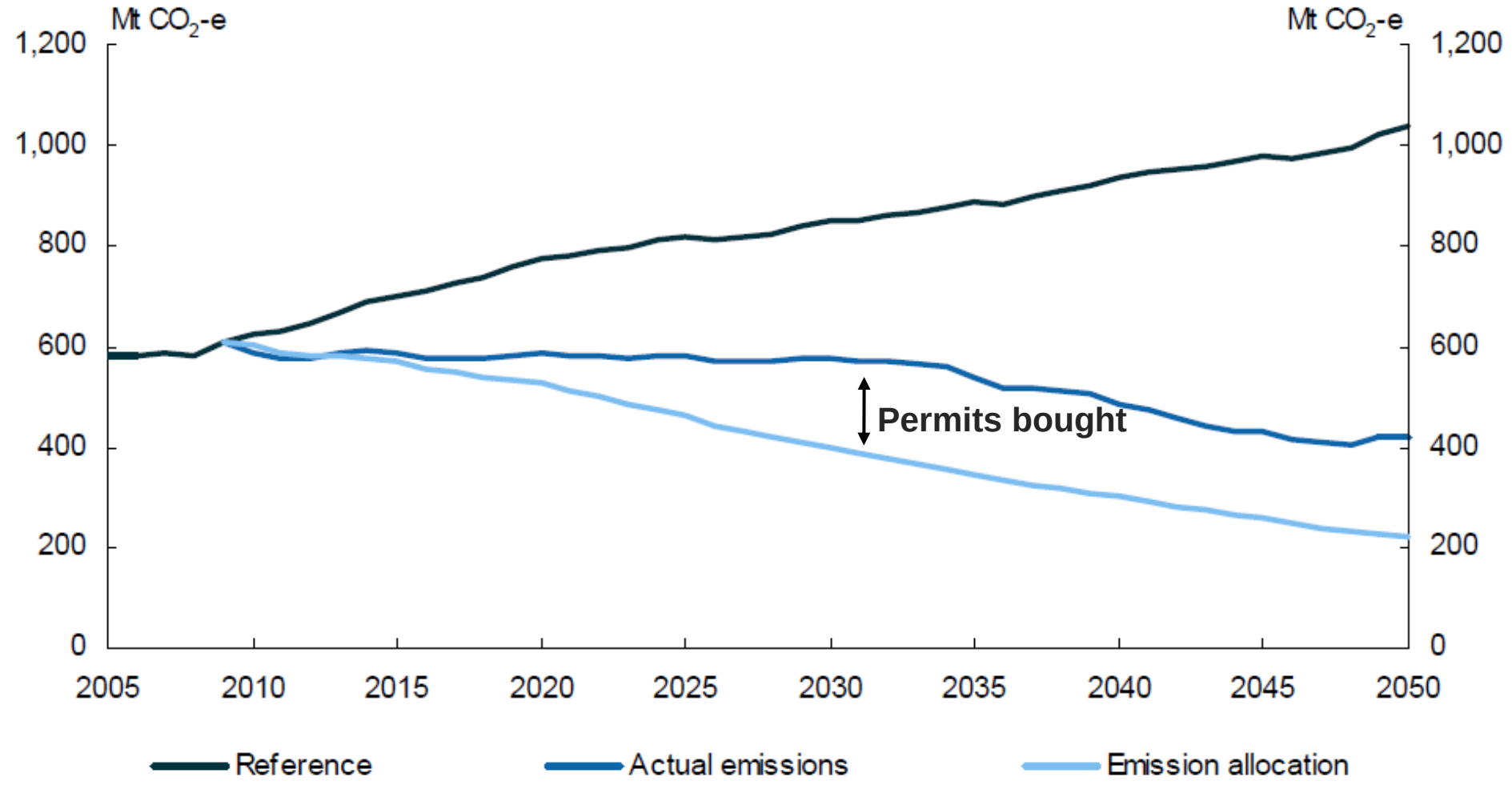
Australia as a permit buyer in international markets

Chart 6.14: Australia's actual emissions, allocations and permit trading

CPRS -5 scenario



Source: Treasury, Australia's low pollution future, 2008

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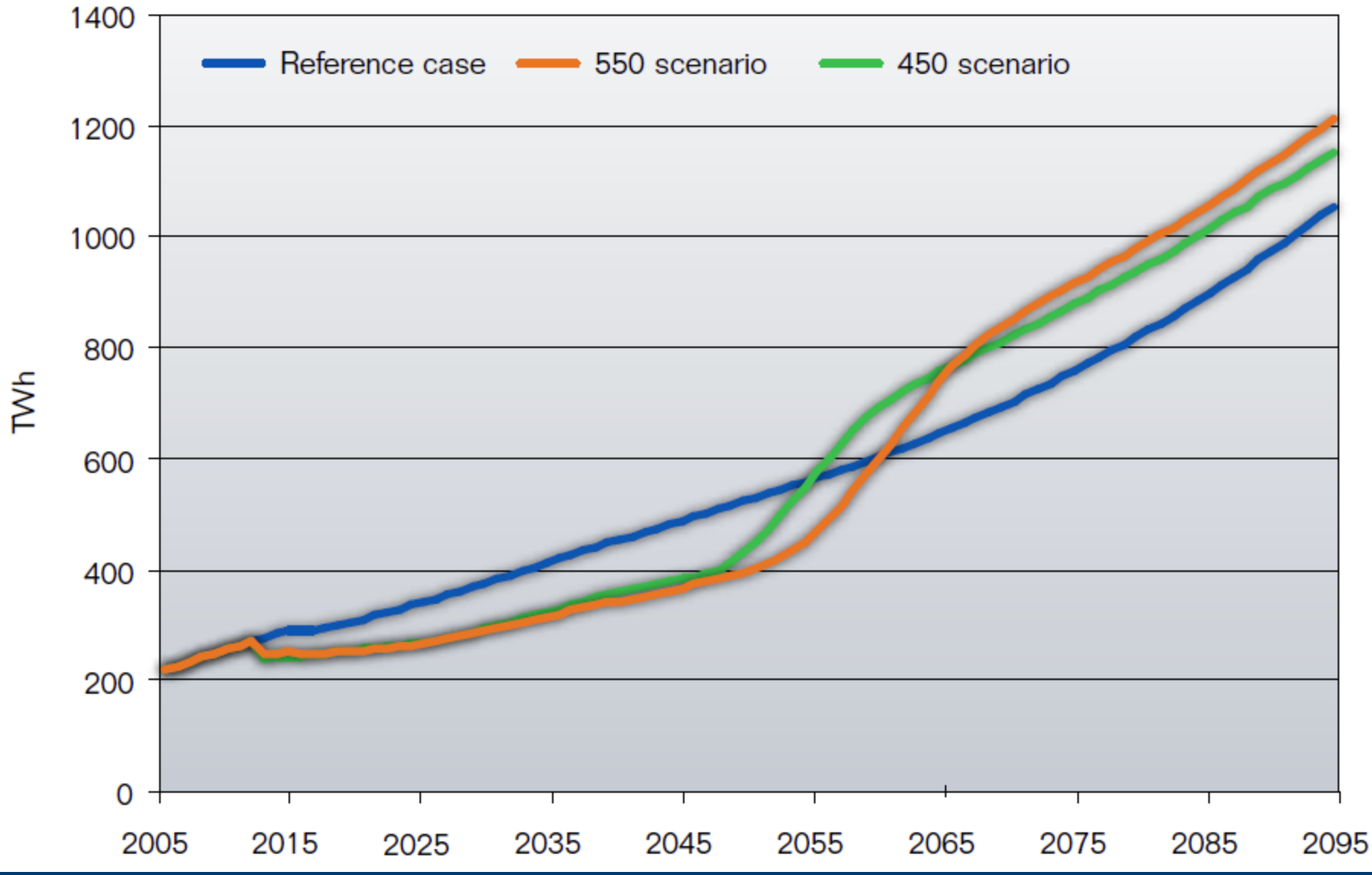
How do de-carbonize Australia's economy?

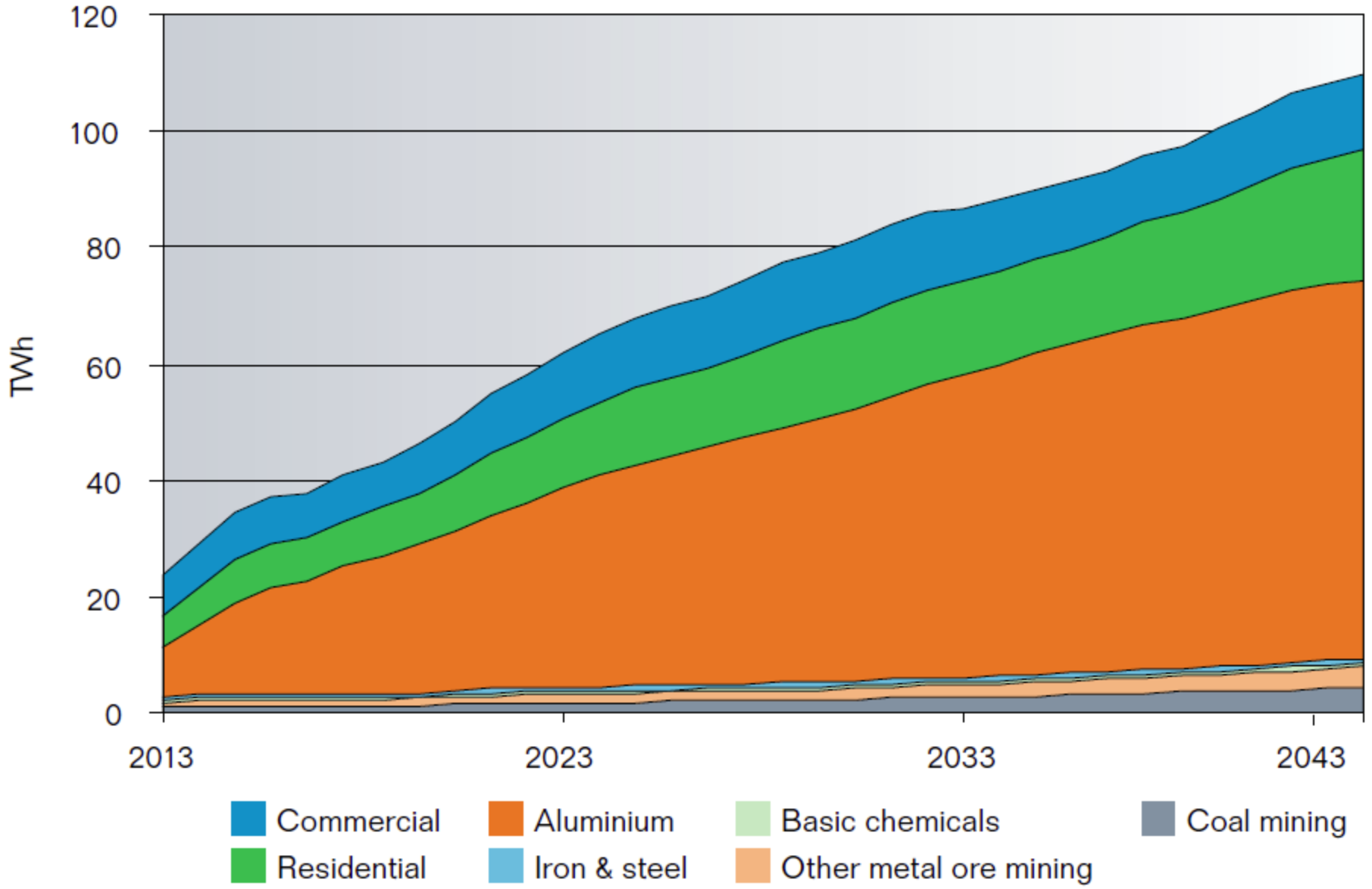
- Dampening energy demand
  - Greater energy efficiency
  - Substitution away from energy intensive goods and services
- Towards zero carbon in power supply
  - Gas; renewables; CCS?; nuclear??
  - Electricity substitutes for direct combustion of oil, gas and coal
- Transport
  - Modes, efficiency, energy sources
- Agriculture
  - shift away from emissions intensive commodities, efficiency, biofuels
- Forestry
  - conservation, plantations

Figure 20.5 Australia's electricity demand



Source: Garnaut Climate Change Review

Figure 20.6 Electricity demand reduction in selected sectors, 550 scenario



Source: Garnaut Climate Change Review

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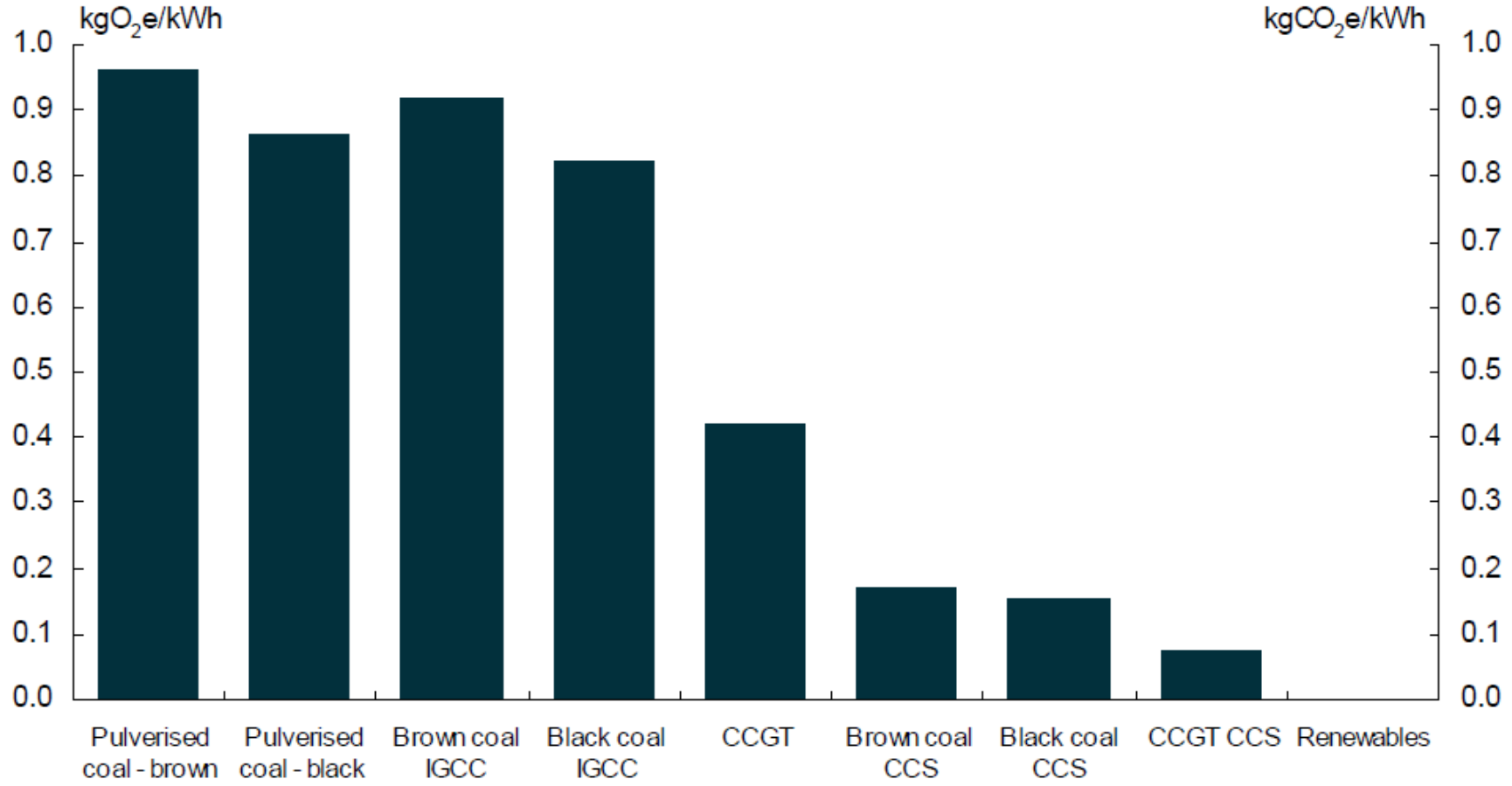
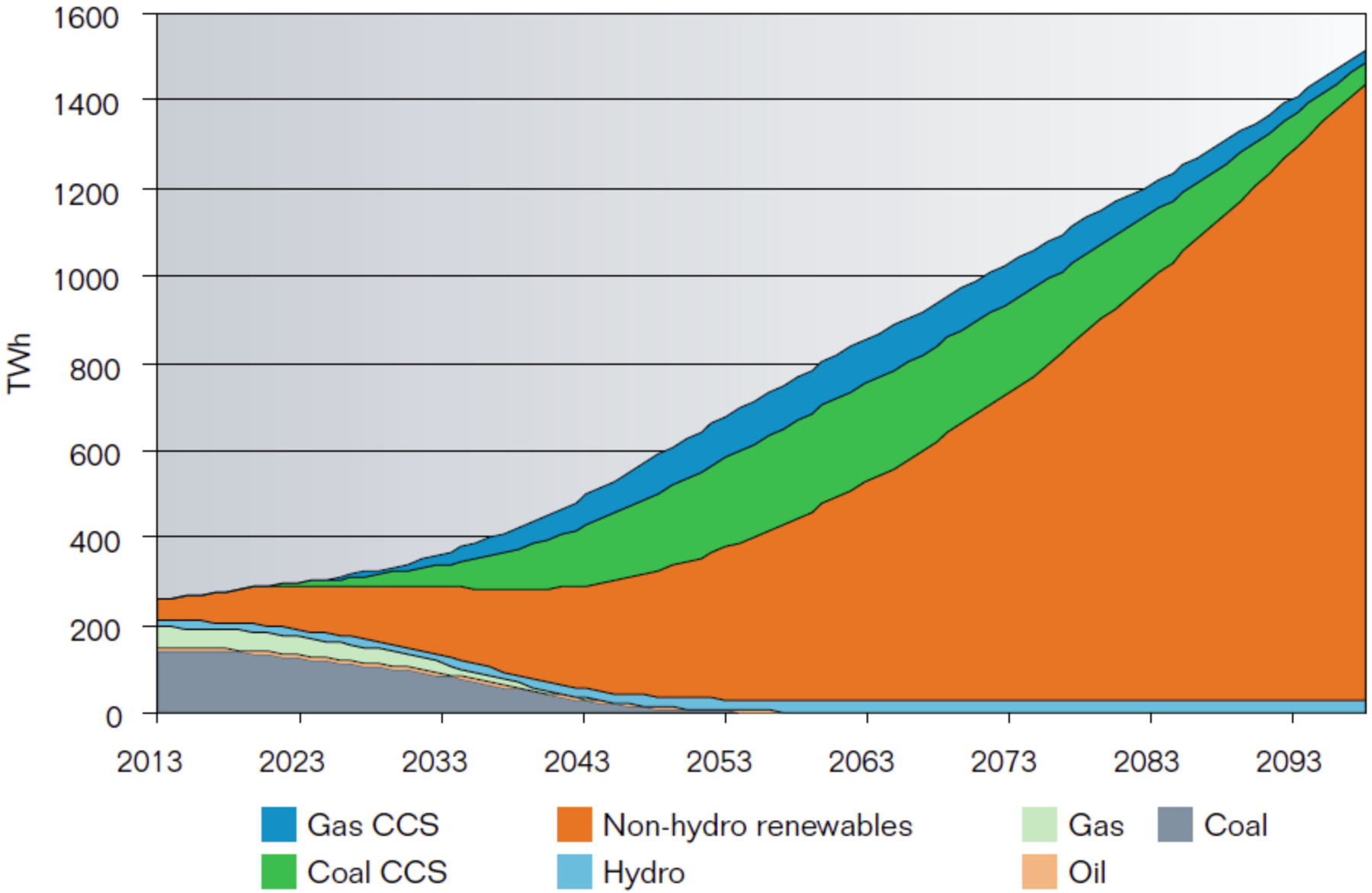
Chart 6.24: Emission intensity of electricity technologies



Note: Emission intensities are for new capacity in 2010. IGCC: Integrated gasification combined cycle; CCGT: combined cycle gas turbine; and CCS: carbon capture and storage.
Source: MMA.

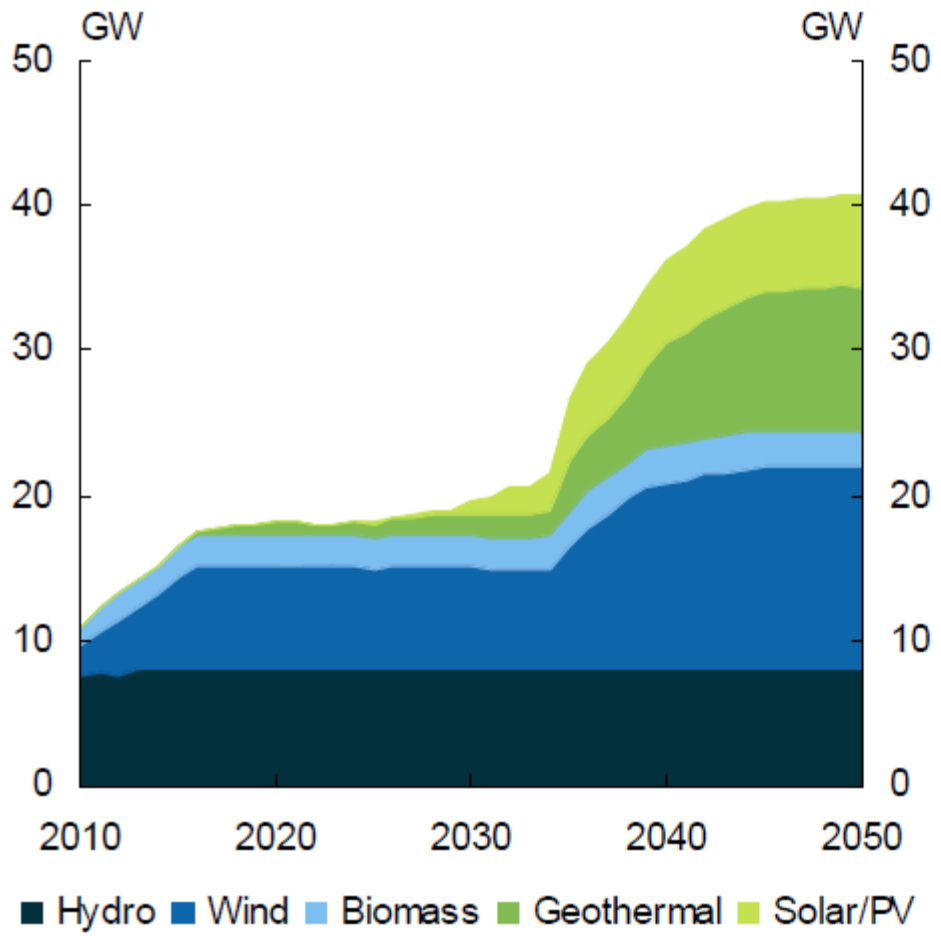
Source: Treasury, Australia's low pollution future, 2008

Figure 20.10 Australia's electricity generation technology shares, 450 scenario



Source: Garnaut Climate Change Review

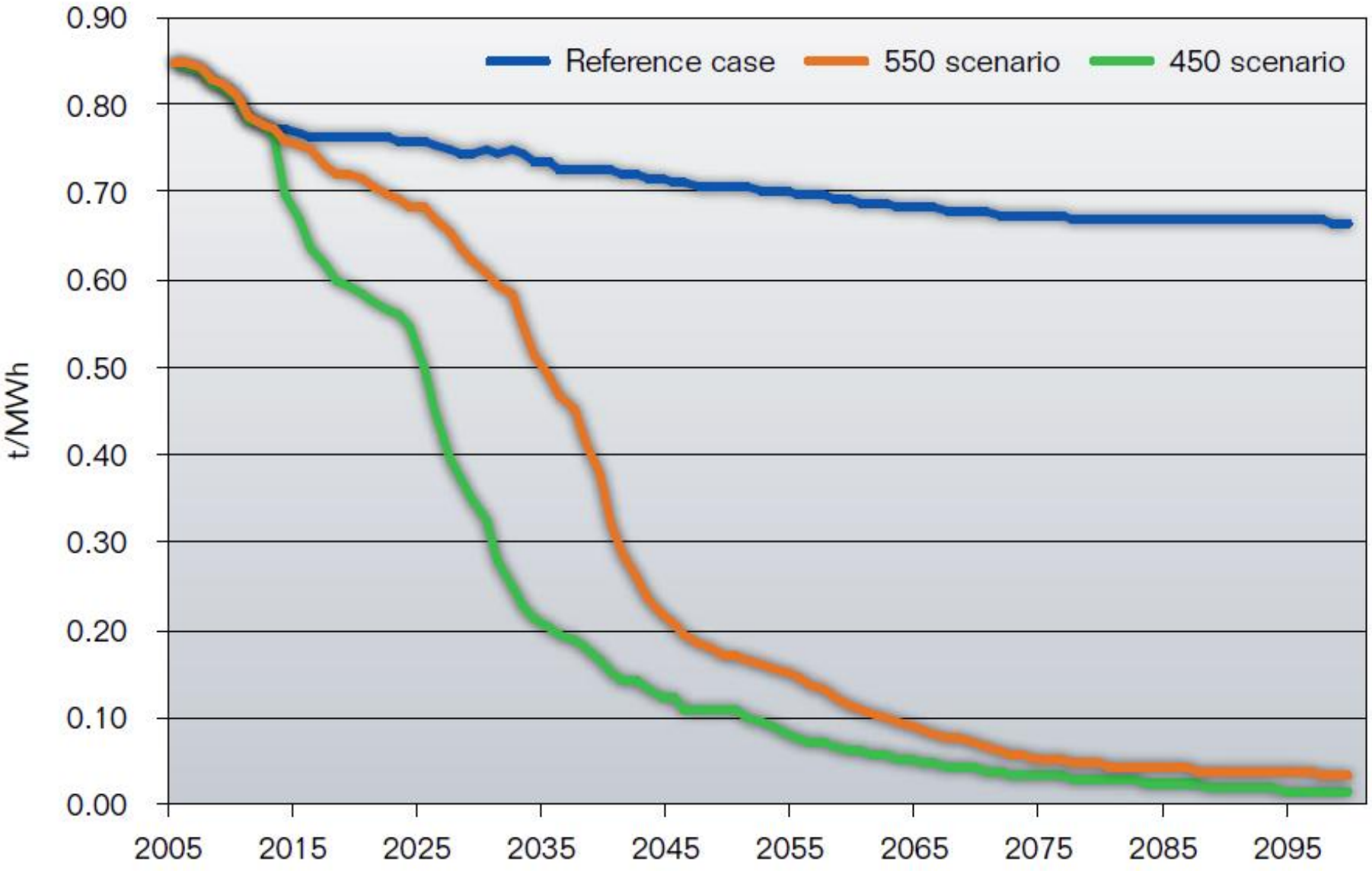
Chart 6.30: Renewables capacity



Source: MMA.

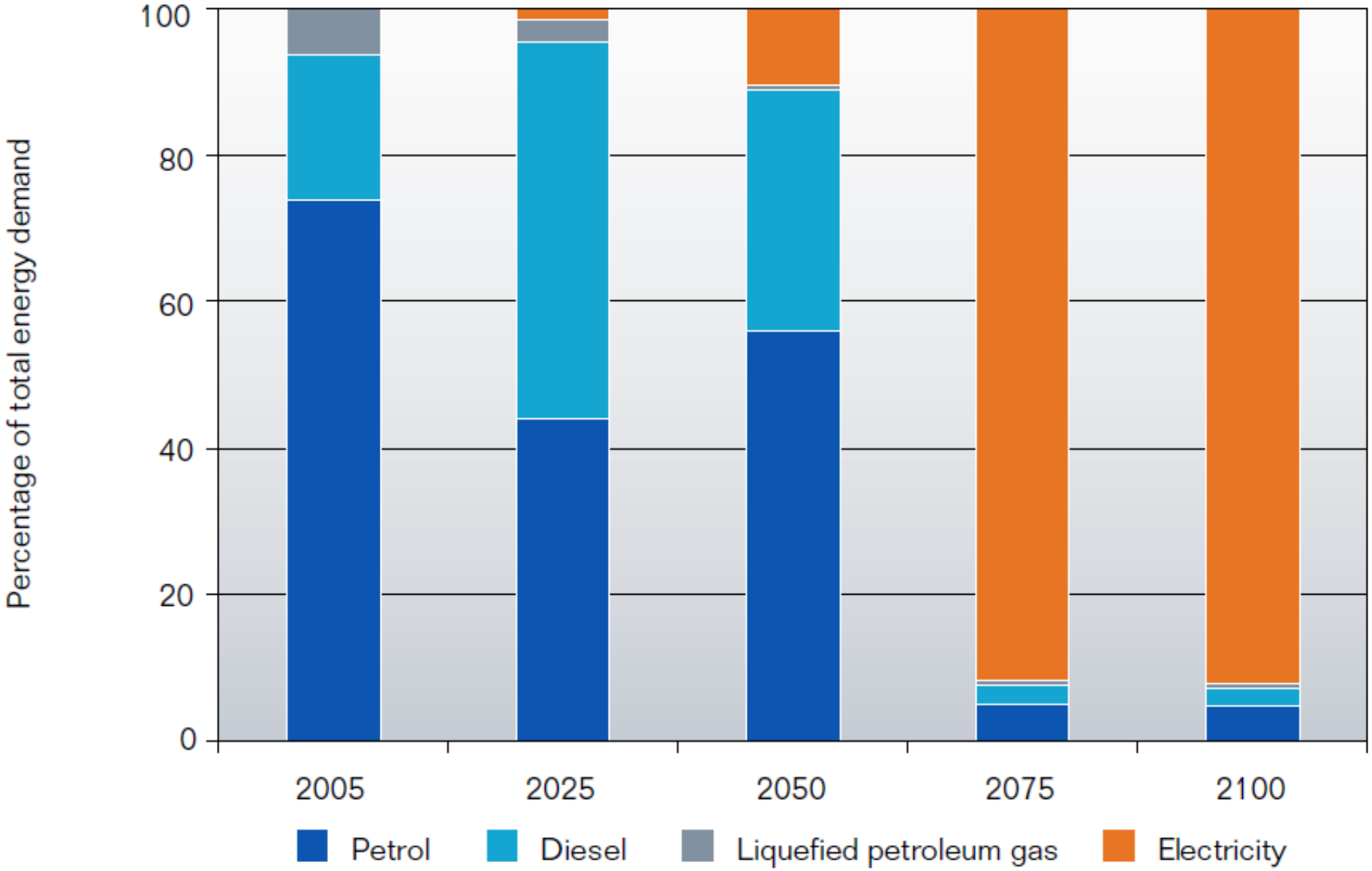
Source: Treasury, Australia's low pollution future, 2008

Figure 20.11 Electricity emissions intensity



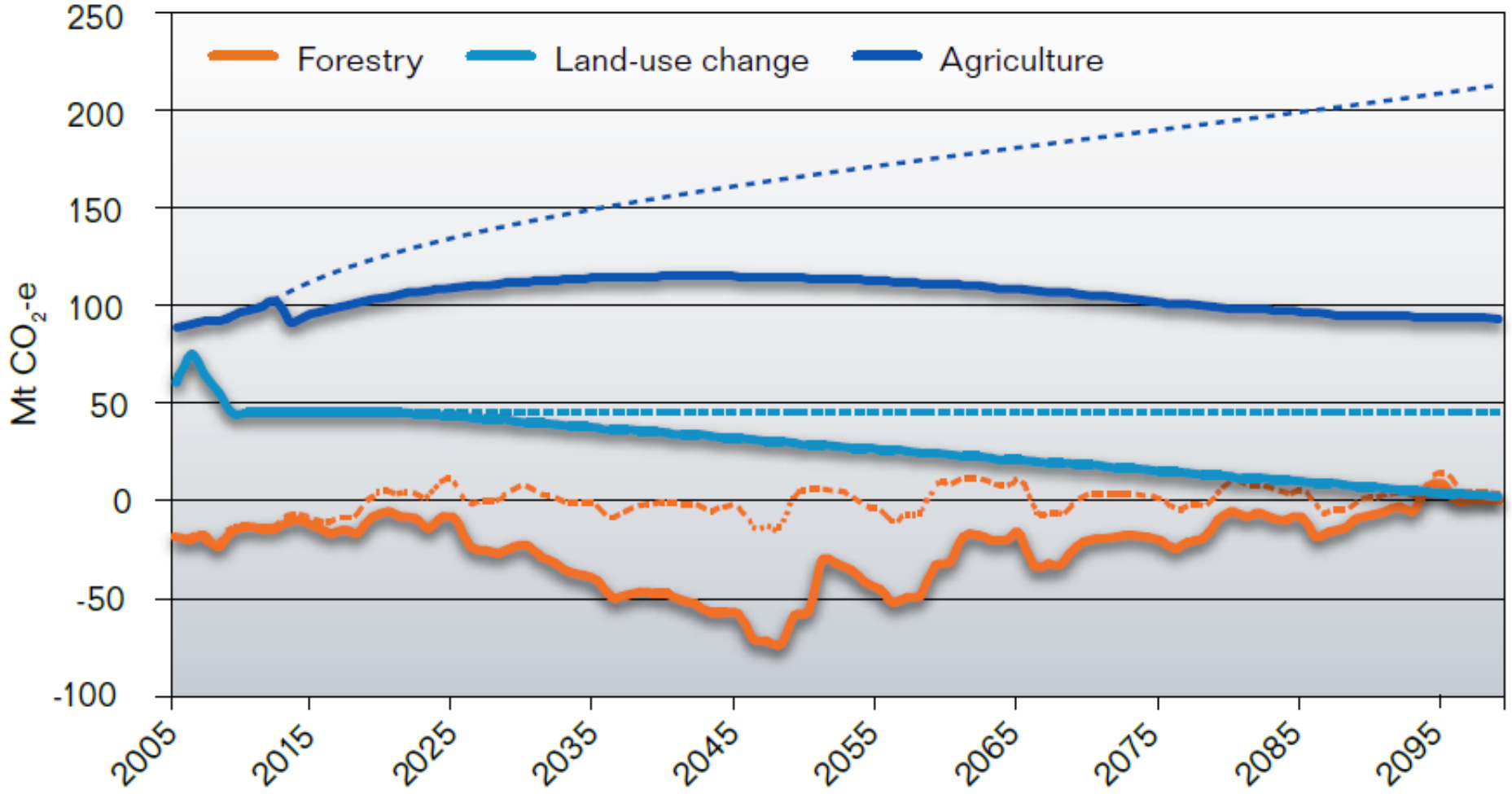
Source: Garnaut Climate Change Review

Figure 21.6 Modelling of road transport fuel use in a 550 standard technology scenario



Source: Garnaut Climate Change Review

Figure 22.3 Non-combustion emissions for agriculture, forestry and land-use change for the no-mitigation and 550 standard technology scenarios

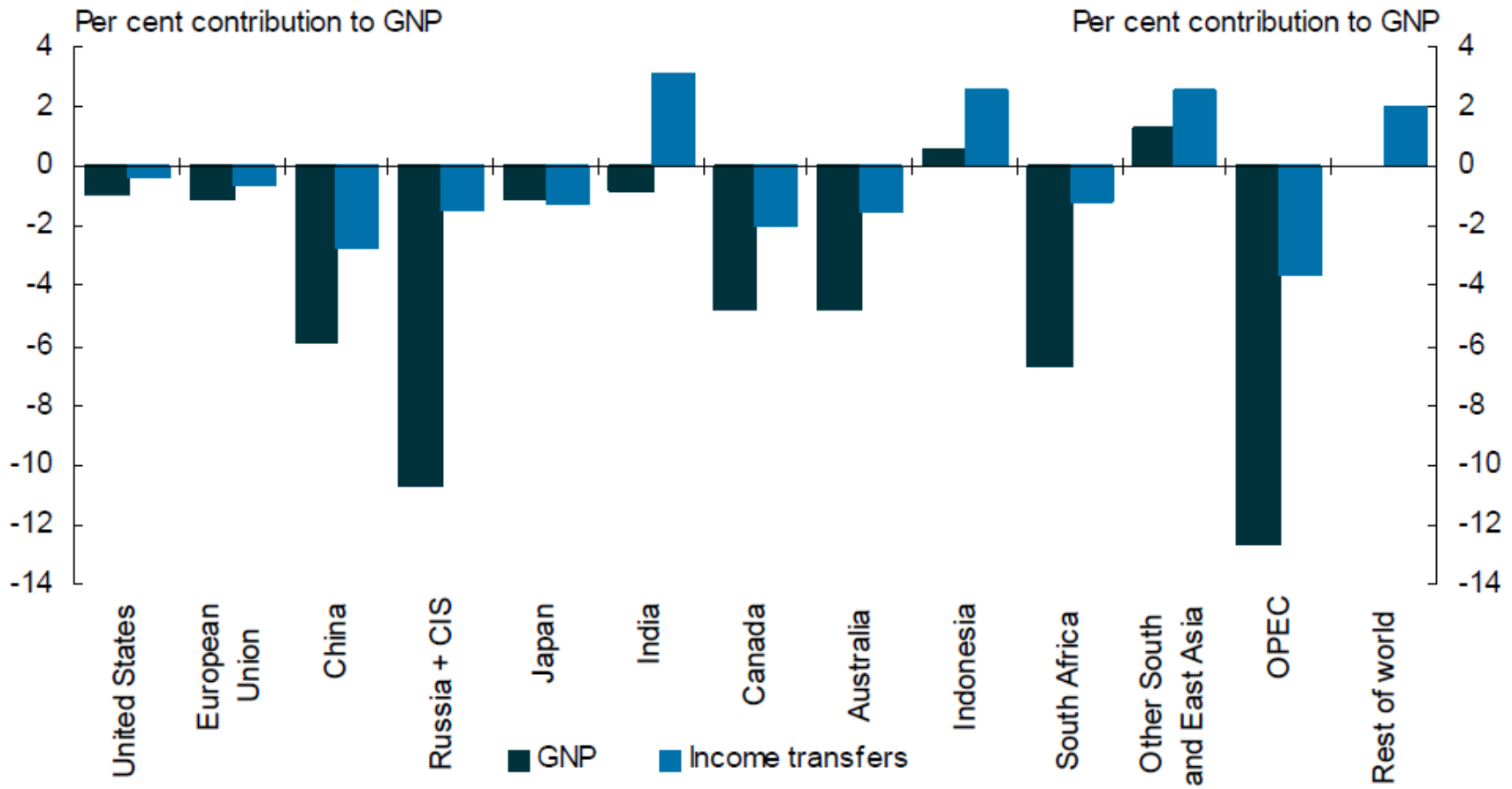


Source: Garnaut Climate Change Review

Economic effects of mitigation and international permit trading

Chart 5.14: Contribution of international income transfers to GNP

Garnaut -10 scenario in 2050



Note: The difference between GNP and income transfers is the GDP impact.
Source: Treasury estimates from GTEM.

Source: Treasury, Australia's low pollution future, 2008

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2020 targets

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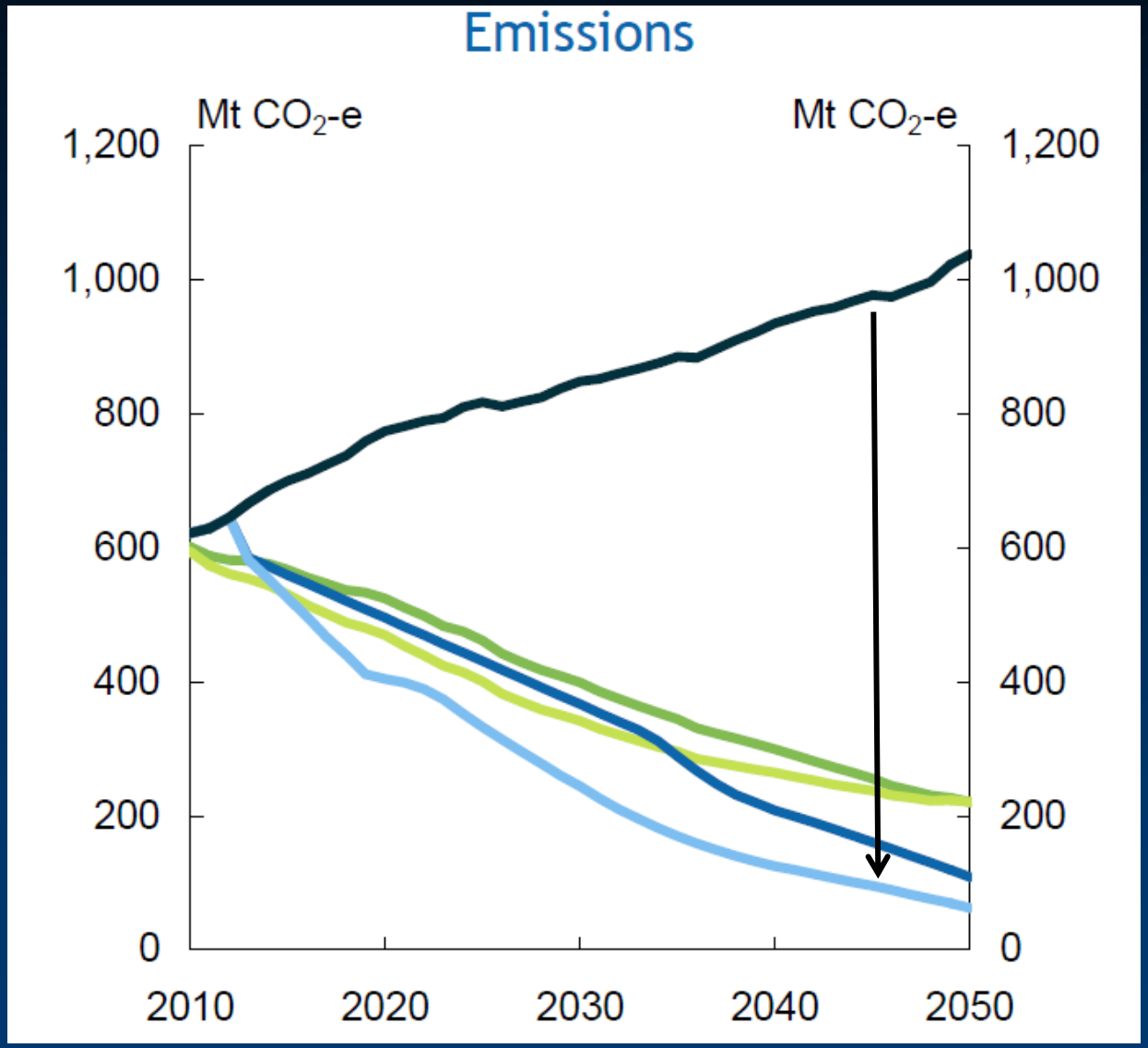
What really matters: transition to very low carbon over decades



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A package of commitments: Garnaut recommendations for a global deal

- Binding targets for developed countries, may buy permits
- Transitional arrangements for developing countries
  - Targets one-sided, linked to GDP growth
- Low-emissions technologies: public financing
  - Australia $2.8b/yr, global $100b/yr
- Adaptation assistance to developing countries
- Sectoral agreements for traded emissions-intensive industries

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