



An assessment of competition for biomass resources within the energy and transport sectors

Energy Transformed Flagship

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Overview

- Changing demands on biomass
- Scope of research
- Scenarios and modelling
- Results and conclusions

Multitude of traditional biomass uses

Some traditional and ongoing uses for biomass include:

- Ecosystem services
- Food
- Fibre
- Building materials
- Energy and heat

New biomass demands

Bio-energy is expected to become increasingly attractive in the future owing to its potential contribution to:

- Lowering greenhouse gas emissions
- Increasing rural and regional employment
- Improving energy security through substituting for oil imports

Resources for expansion of biomass use?

Limitations

- The size of total energy and transport sector fuel demand
- For economic, social and political reasons existing uses, particularly food, must be maintained

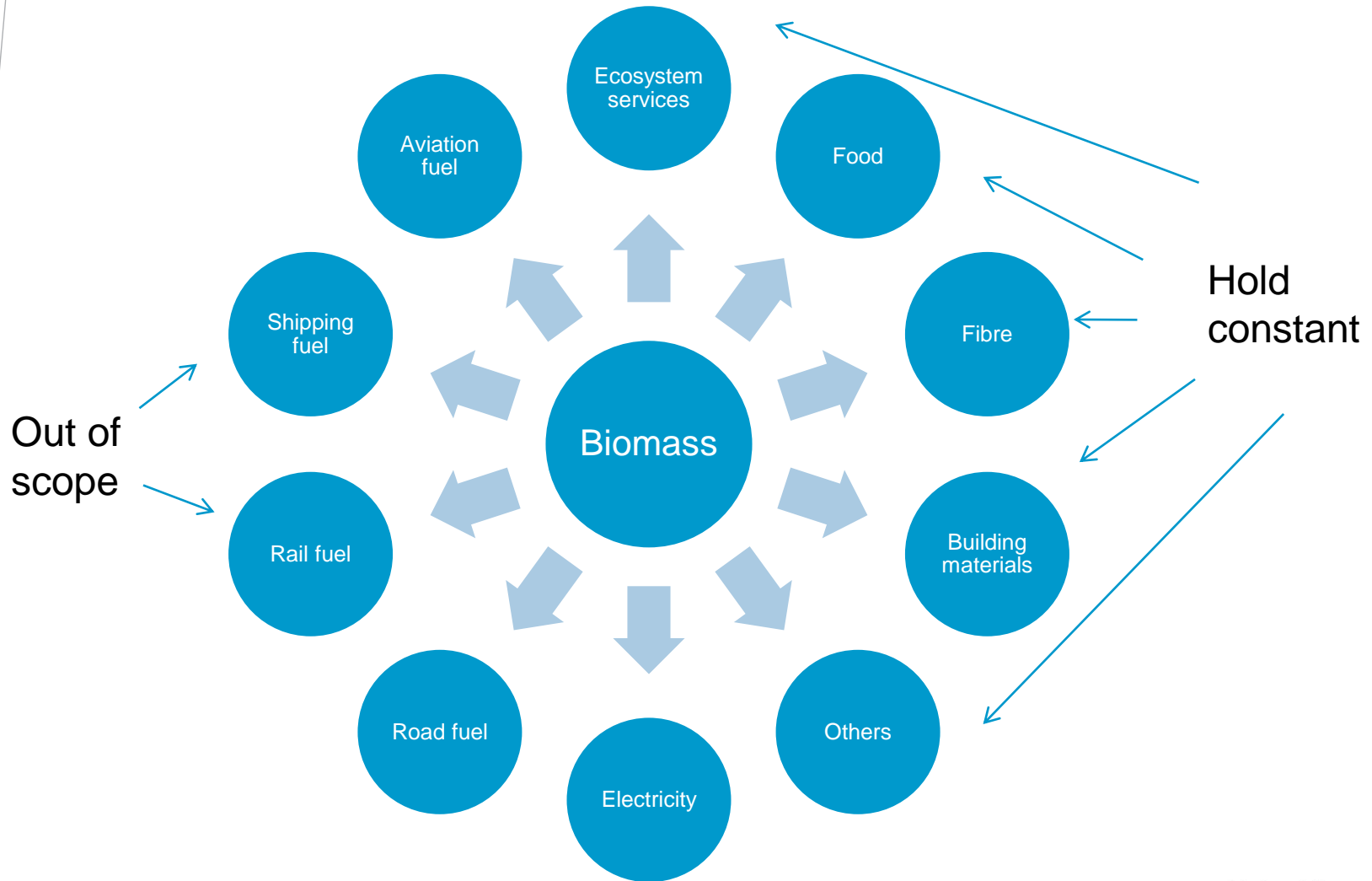
Supporting expansion:

- New (non-food) feedstock varieties
- New refining technologies

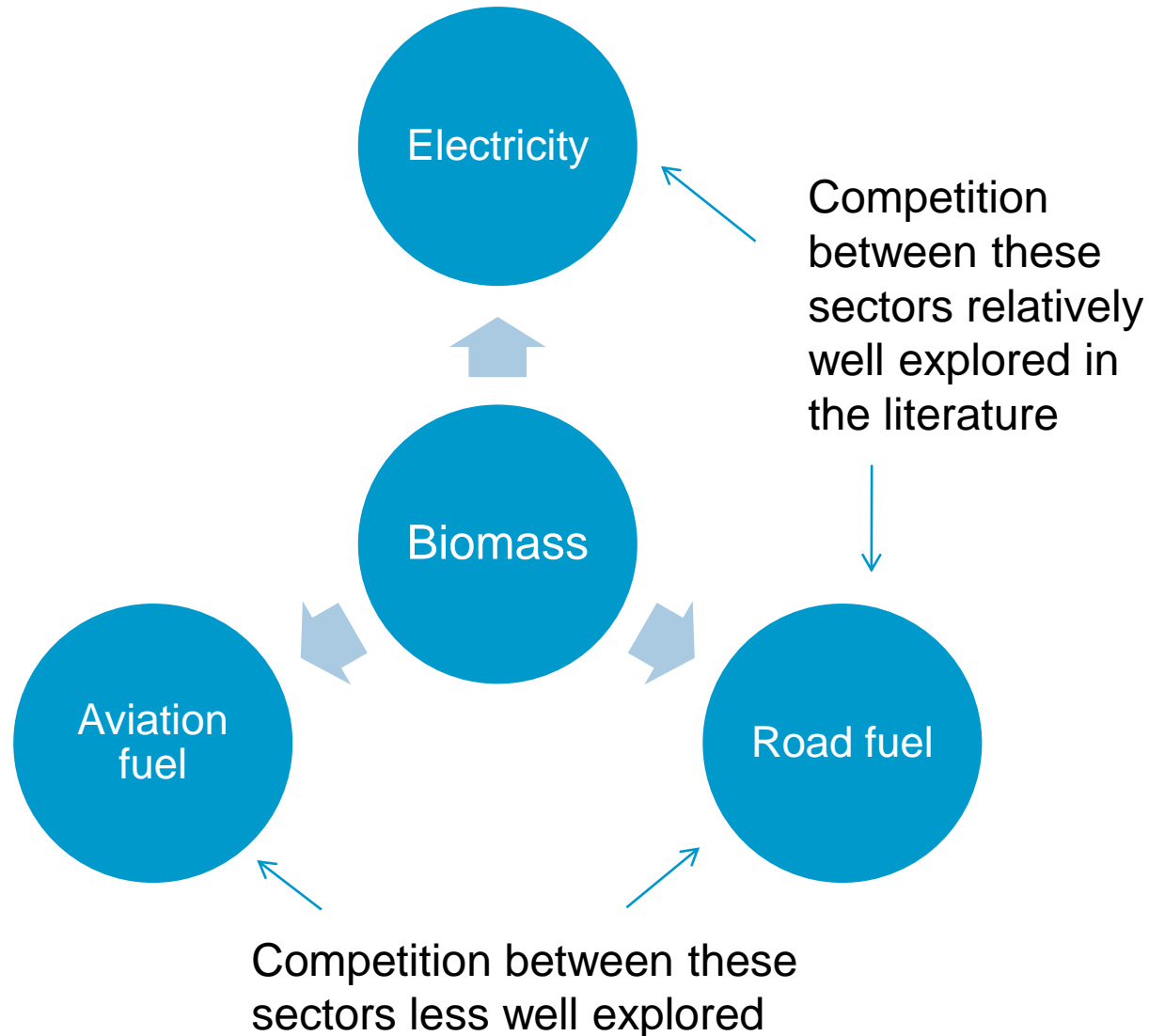
How will biomass resources be allocated?

- By application of sustainability principles by government and businesses
- To those most able to afford them governed by:
 - Price of existing products or services
 - The relative cost of biomass conversion
 - The availability and cost of alternatives
 - Government policies: e.g. mandates, excise rates
 - The emission intensity of each sector.

Scope: how will this allocation play out?



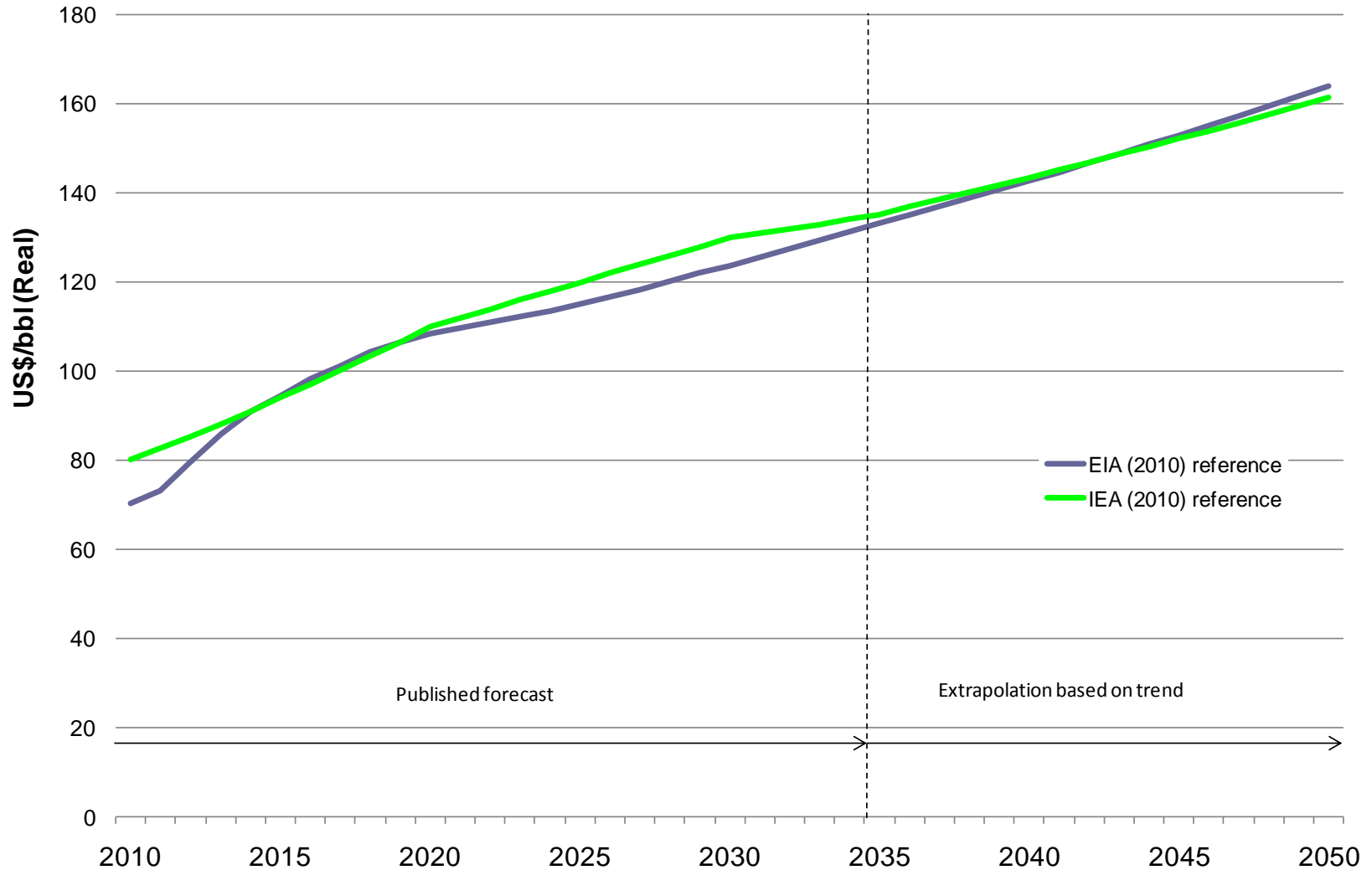
Scope: how will this allocation play out?



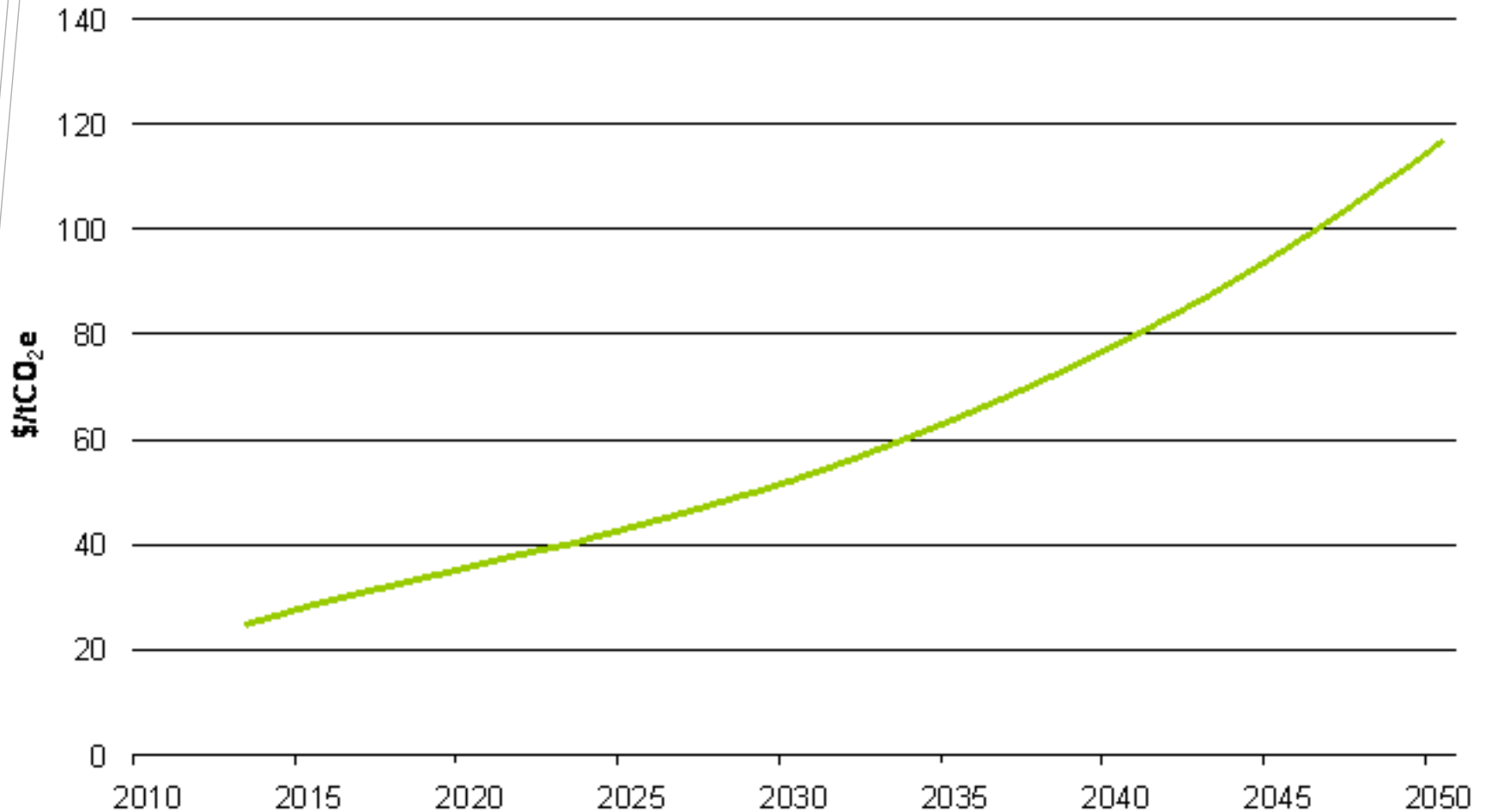
Methodology

- Two scenarios: with and without a carbon price
- Use of a partial equilibrium model of Australasian energy sector called ESM:
 - Solves relevant sectors simultaneously
 - Detailed fuel and technology pathway representation
 - Annual time steps to 2050
 - Modelled co-developed with ABARE in 2006

Scenario assumptions

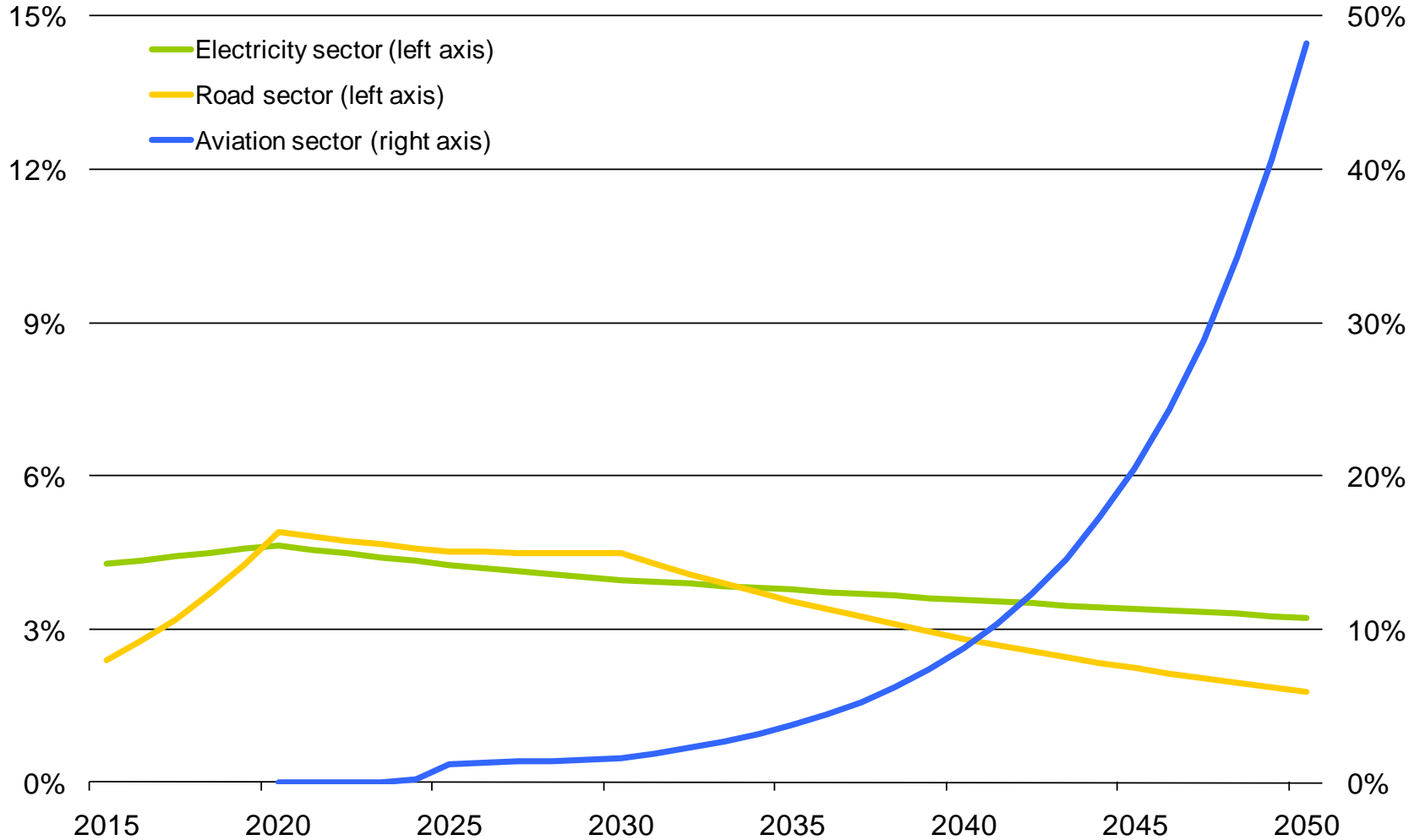


Scenario assumptions: carbon price scenario



Source: Treasury CPRS-5 scenario, *Australia's Low Pollution Future*

Model results: reference case

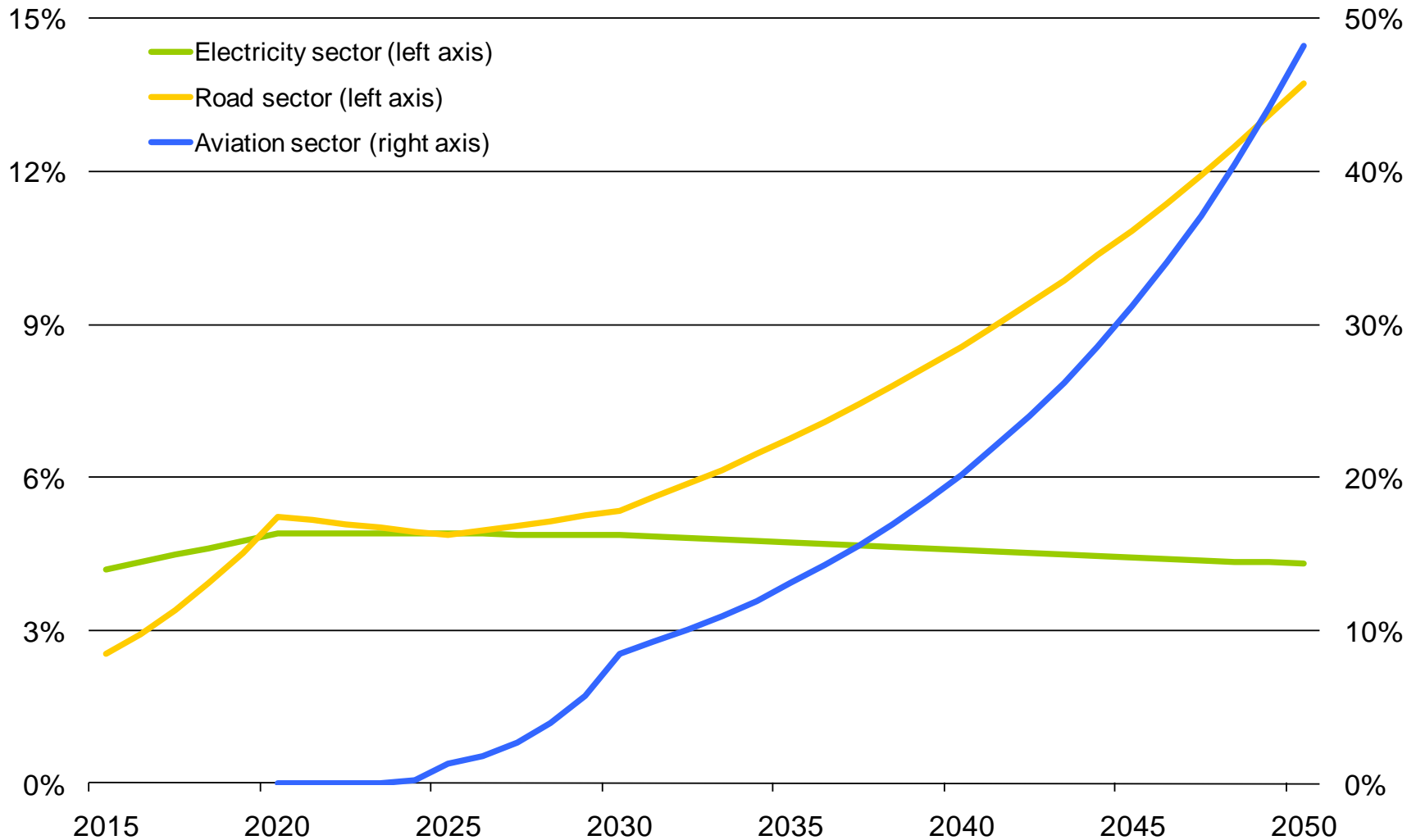


Discussion: reference case

Higher aviation biomass use is driven by:

- The excise differences between the sectors becoming less over time
- The road sector partially electrifies over time
- Biofuel availability has expanded
- The relative cost of refining jet fuels declining
- Use of fossil synthetic road liquid fuels
- Alternative low cost electricity generation technologies becoming available

Model results: carbon price scenario



Discussion: carbon price scenario

Higher electricity, aviation and road biomass use is driven by:

- Biomass is more competitive in all sectors
- Fossil electricity and synthetic fuels are not viable in the long term under a carbon price

Carbon price has the effect of “expanding the pie”