

**WORLD
ENERGY
OUTLOOK**



2002



**INTERNATIONAL
ENERGY AGENCY**

Increasing Reliance on Renewables and Efficiency: Response

Results from the IEA World Energy Outlook 2002

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Increasing Reliance on Renewables and Efficiency

- **Two approaches:**
 - **Estimating the impact that technologies can have to reduce emissions.**
 - **Estimating the impact that energy policies can have to reduce emissions.**
- **Each approach is important:**
 - **The first can guide technology development and deployment policies.**
 - **The second is needed to estimate the impact that these policies would likely have.**
 - **This work reflects the second approach.**



Alternative Policy Scenario Approach

- **Estimate the impact of new policies & measures being considered by OECD countries on energy use & CO₂ emissions.**
- **Calculate the impact over time using bottom-up capital stock turnover models.**
- **Integrate bottom-up analysis results into IEA's World Energy Model to calculate price and system effects.**



Electricity Generation

Policy groups considered in the AS

- **Increased use of renewables**
 - **Renewable directive EU**
 - **RPS (US and Canada)**
 - **Renewable energy targets (JANZ)**
- **Increased CHP**
- **Improved efficiency**
 - **Advanced gas (CCGT)**
 - **Advanced coal (IGCC)**
 - **Fuel cells (natural gas reforming)**



Industry Sector Policies Evaluated

Policy category	End-uses impacted	Technology Impact	Regulations	Standards and certification



Residential and Services Sectors

Policies Evaluated

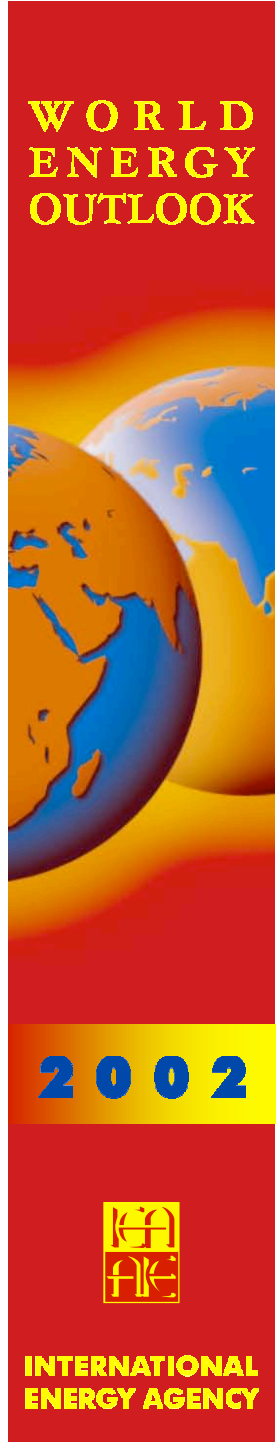
Policy Group	Technology Impact	Regional Policies & Measures
<i>Mandatory Policies:</i>		
Equipment Standards	Increased efficiency of all new equipment	NAECA standards (US & Canada) Framework Directive (EU) Top Runner, AS/NZS standards (Japan, Australia, NZ)
Building Codes	Increased heating and cooling efficiency of new buildings	1993/95 MEC, 1998 IECC (US & Canada) Buildings Directive (EU) Revised Building Code of Australia (Australia)
<i>Voluntary Policies:</i>		
Financing	Increased penetration of highest efficiency devices on the market	Utility Rebates (US & Canada) Federal subsidies, Next-Generation Housing loans (Japan) ENERGY SMART (Australia)
Endorsement Labelling	Increased penetration of highest efficiency devices on the market	Energy Star (US & Canada) International Energy Star (Japan, Australia)
Whole-Building Program	Increased efficiency of all energy systems in new & existing buildings	Energy Star, Building America (US & Canada) Home/Business Energy Management Systems (Japan) ENERGY SMART (Australia)
Accelerated R&D	Reduced first costs and increased penetration over the long-term of emerging super-	Federal building science, lighting research (US & Canada) Federal lighting research (Japan)

NAECA = National Appliance Energy Conservation Act

AS/NZS = Australian Standard/New Zealand Standard

MEC = Model Energy Code

IECC = International Energy Conservation Code

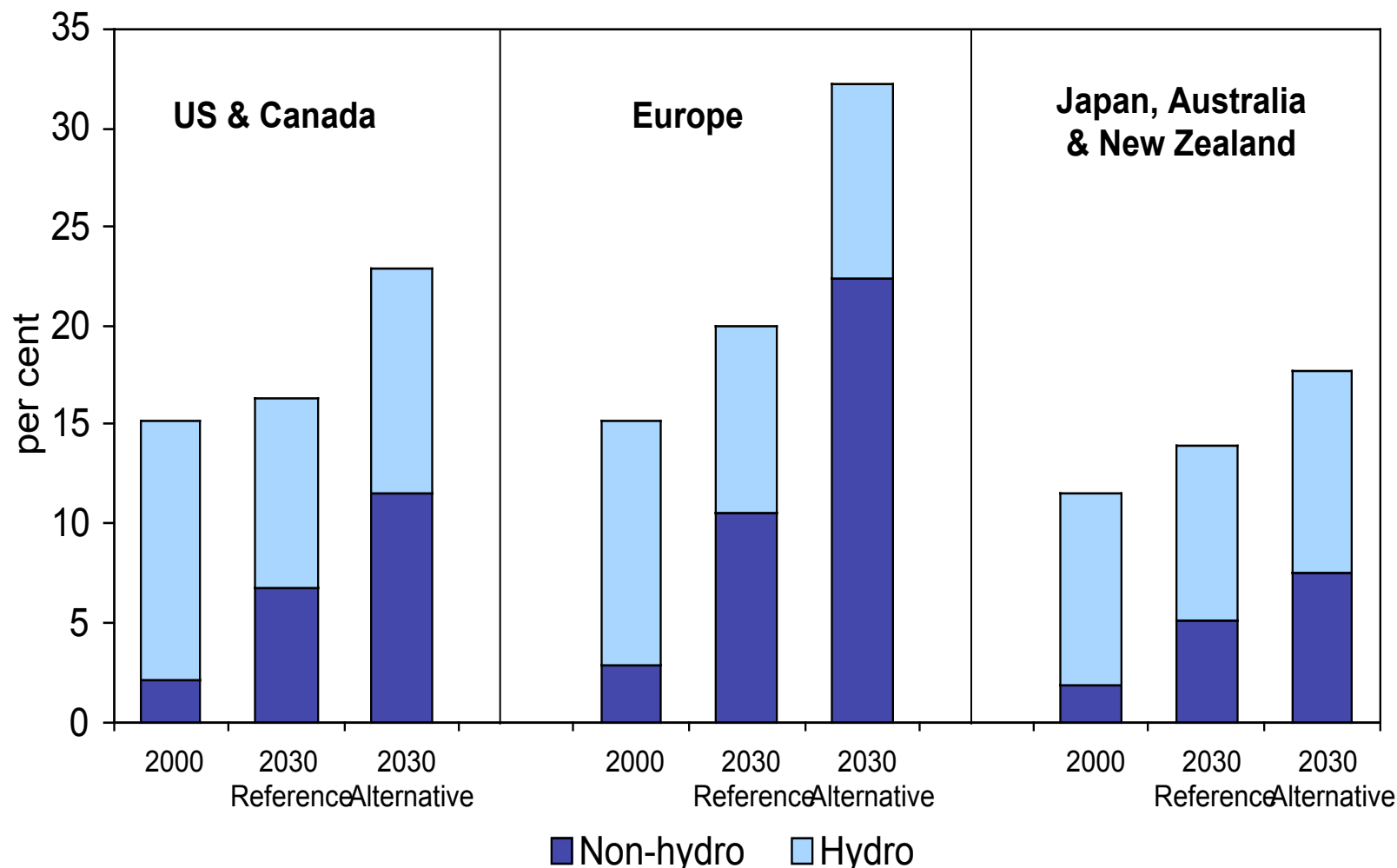


Example: Transport

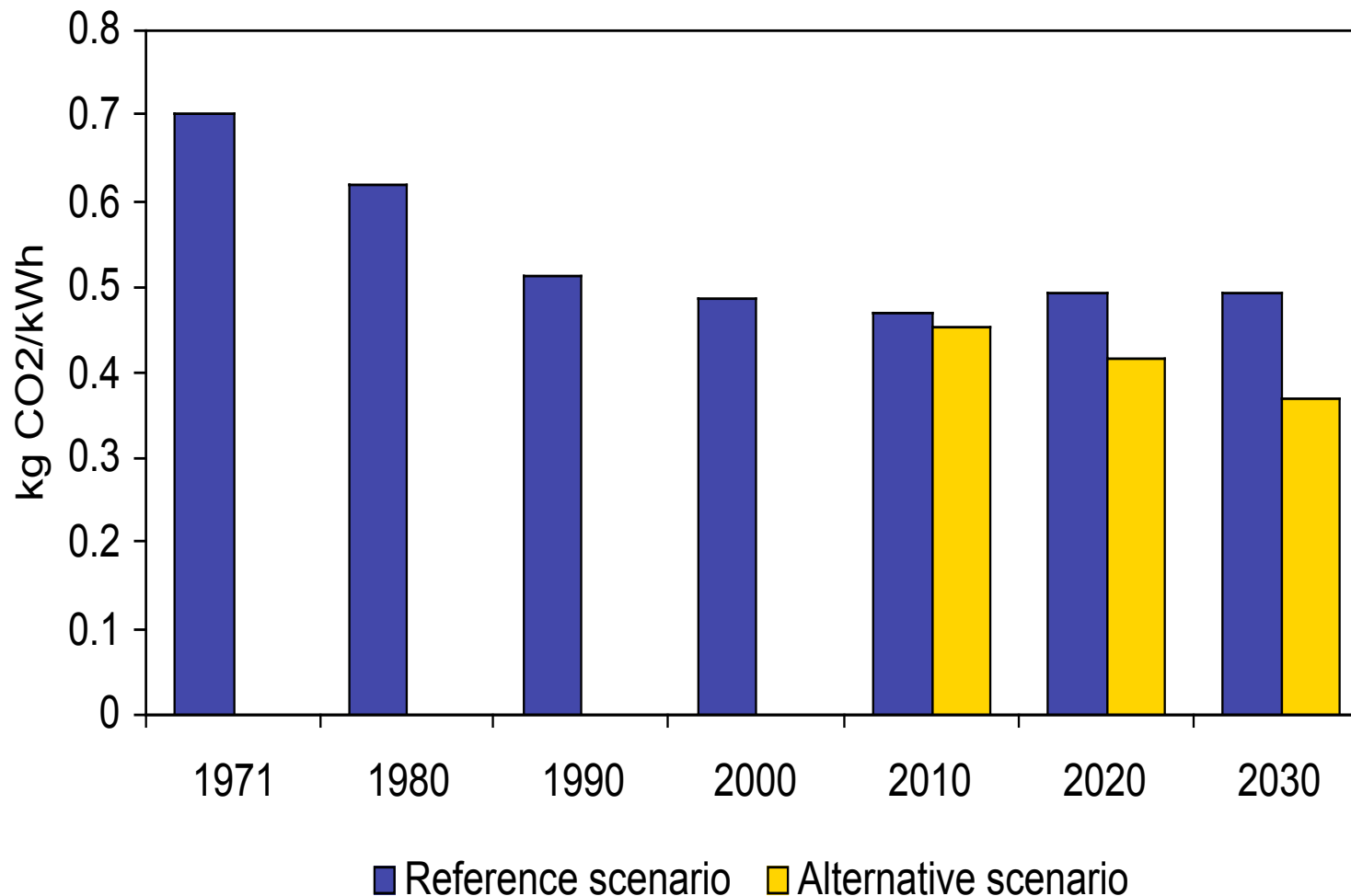
Policy groups considered

Policy aim	Impacts	Improved vehicle fuel efficiency	New car and light truck effi

Share of Renewables in Electricity Generation

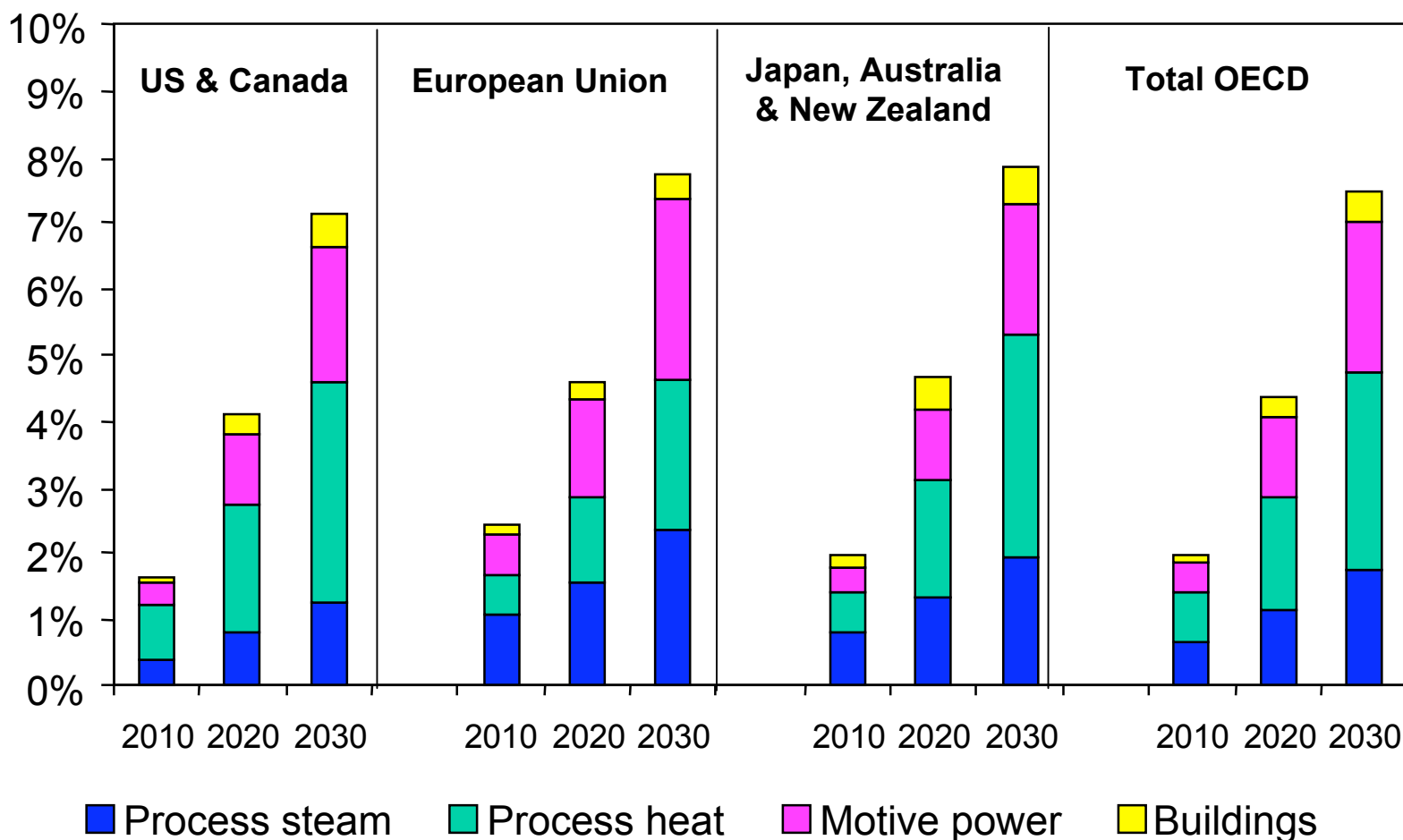


OECD CO₂ Emissions per kWh of Electricity Generated



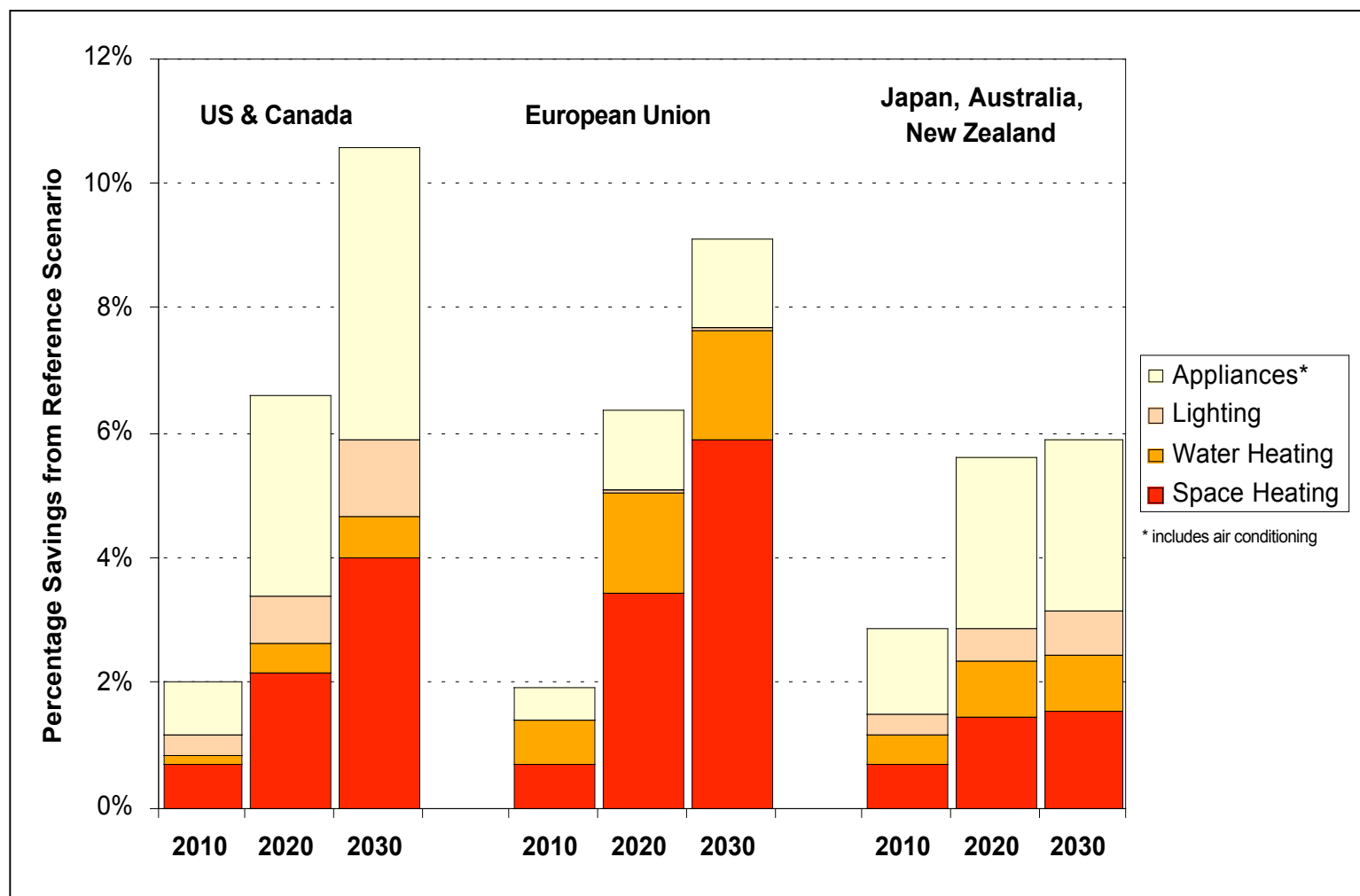
Industrial Energy Demand

Reduction Compared to Reference Scenario



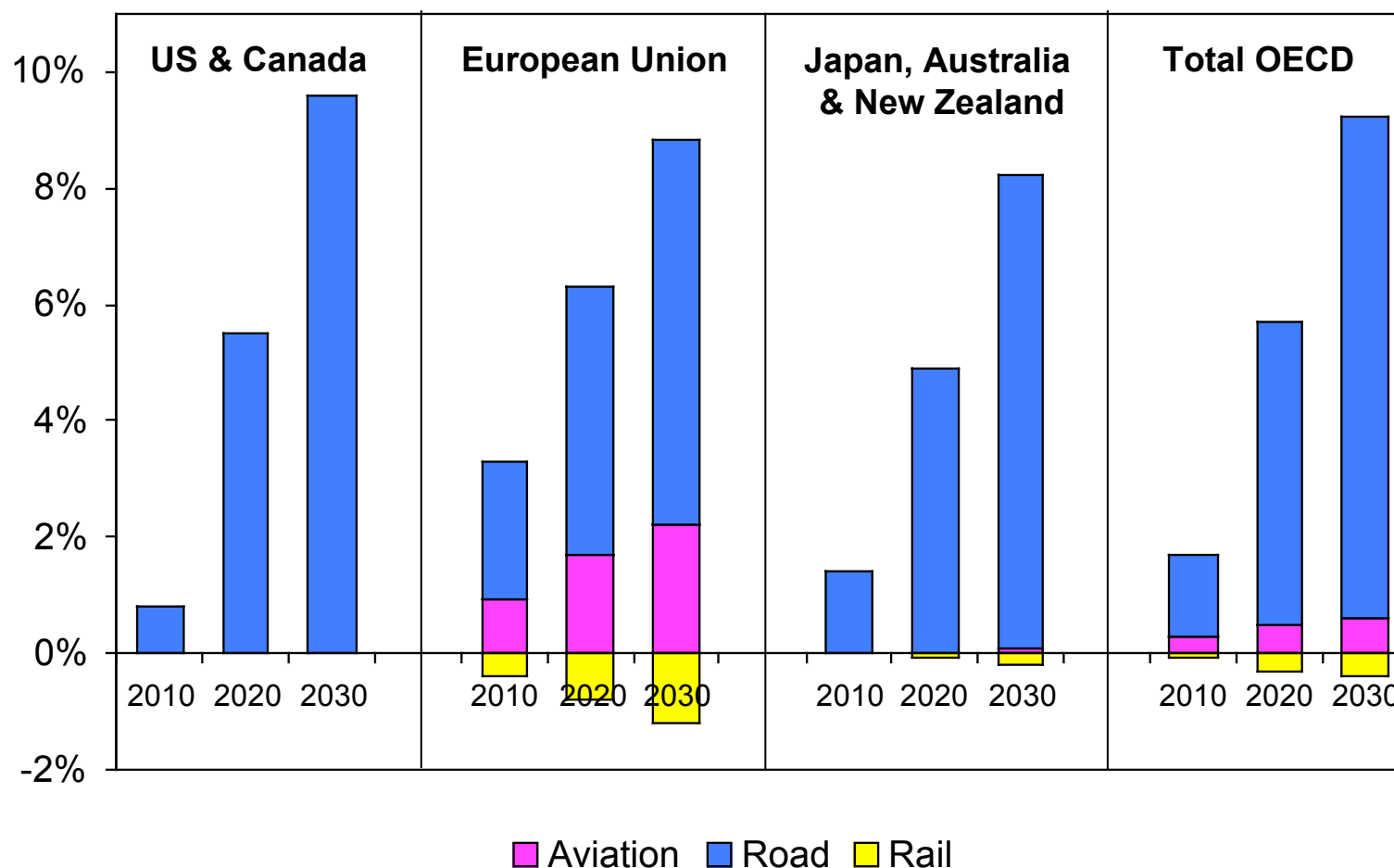
Alternative Scenario Results

Residential Savings by End Use



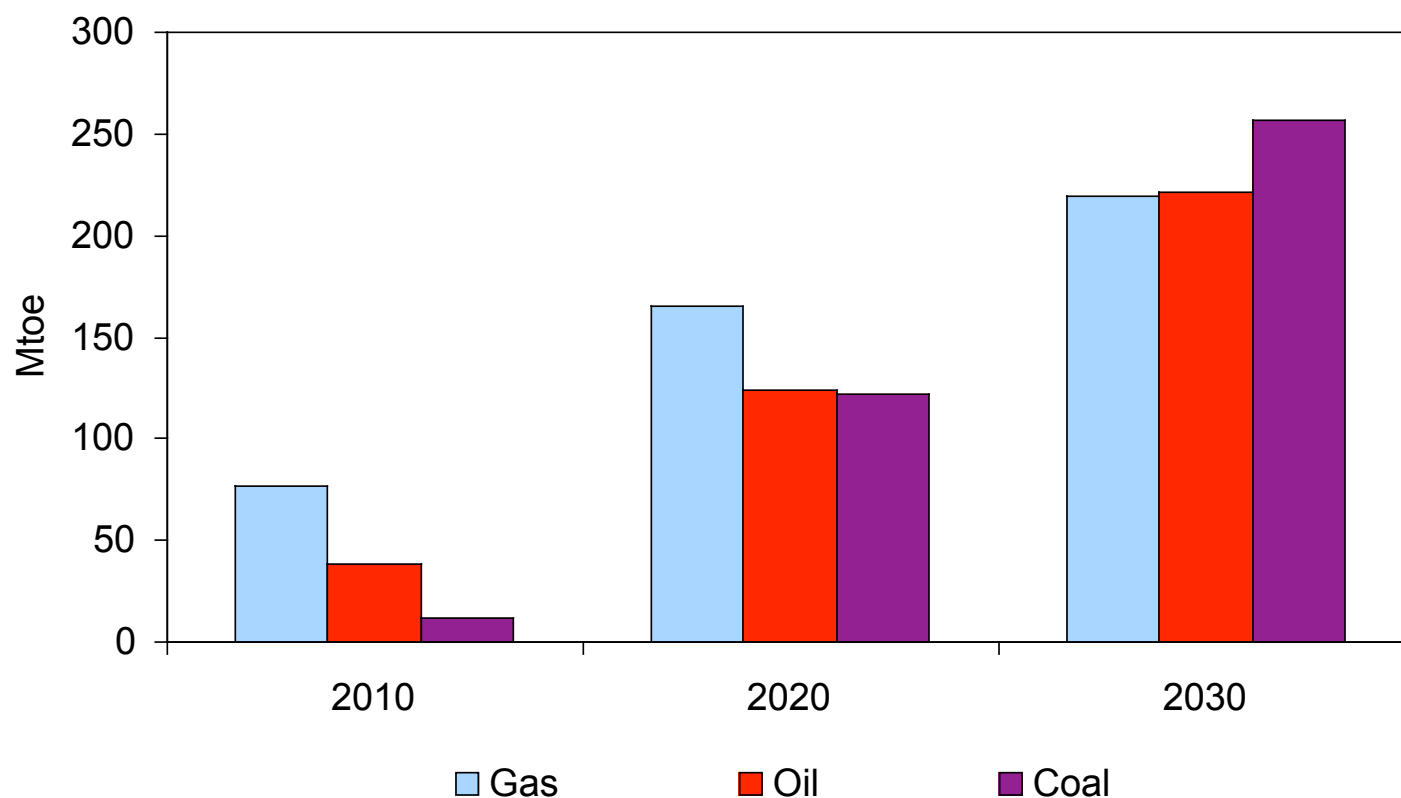
Transport-Energy Demand in the Alternative Scenario

Reduction in Emissions Compared to Reference Scenario



Fossil-Fuel Savings in the Alternative Scenario

Reduction in Primary Energy Use Compared to Reference Scenario



*Energy savings would be 9% of projected demand
in the Reference Scenario in 2030*

OECD CO₂ Emissions

