

A stylized globe in shades of blue and red, with several glowing yellow and orange curved lines representing energy or data paths around it.

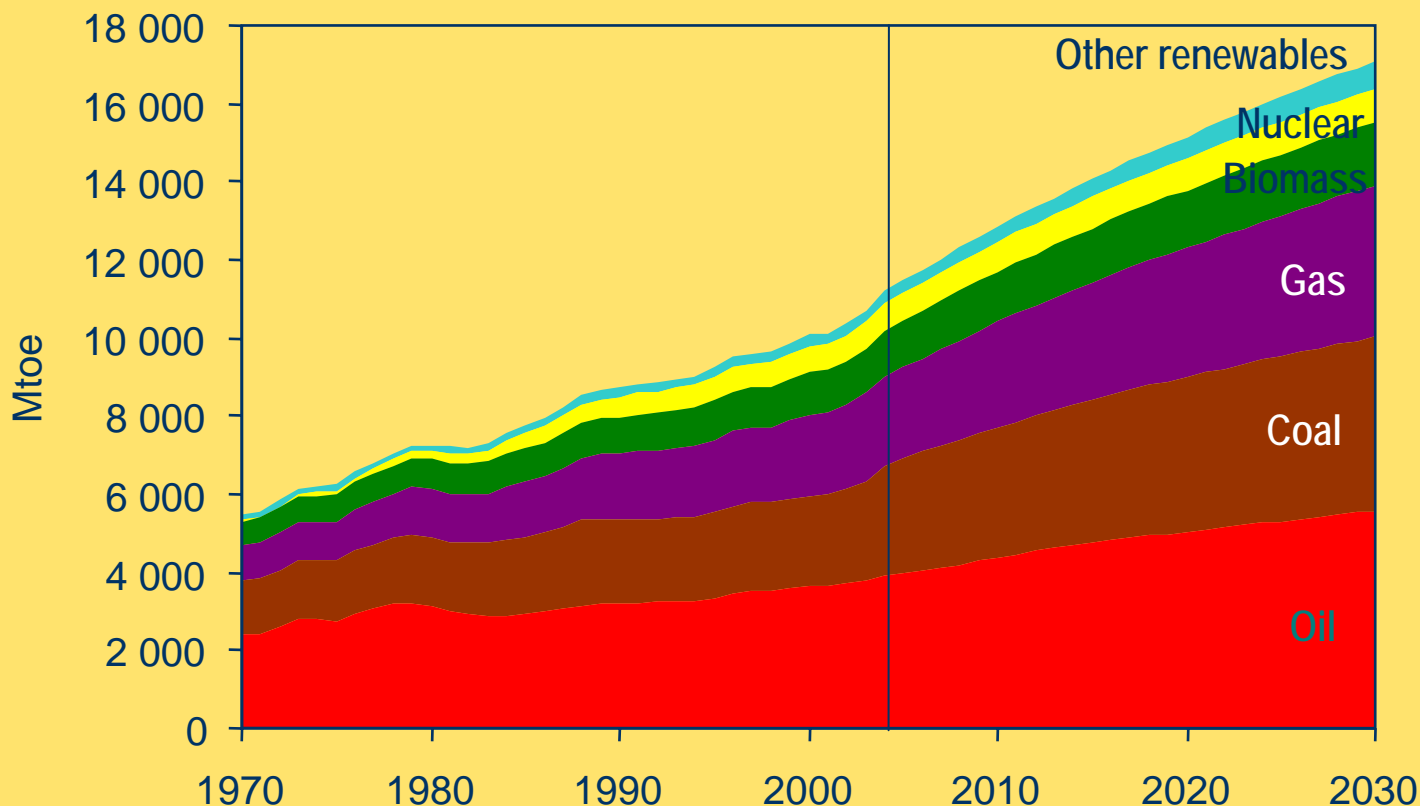
# World Energy Outlook 2006

## Focus on EU

*Laura Cozzi*  
*Principal Energy Analyst - IEA*

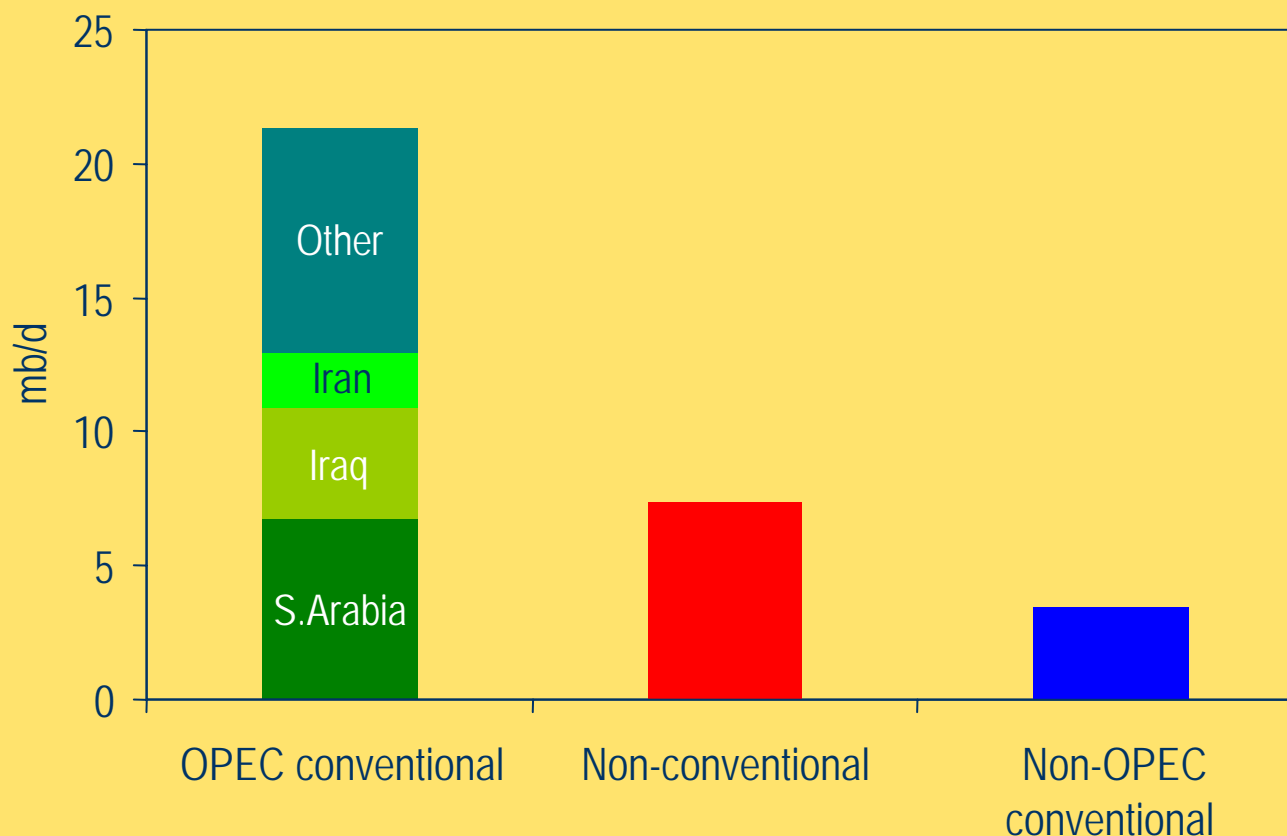
Concerto Conference  
European Union Sustainable Energy Week  
Bruxelles - 1 February 2007

# The Reference Scenario: World Primary Energy Demand



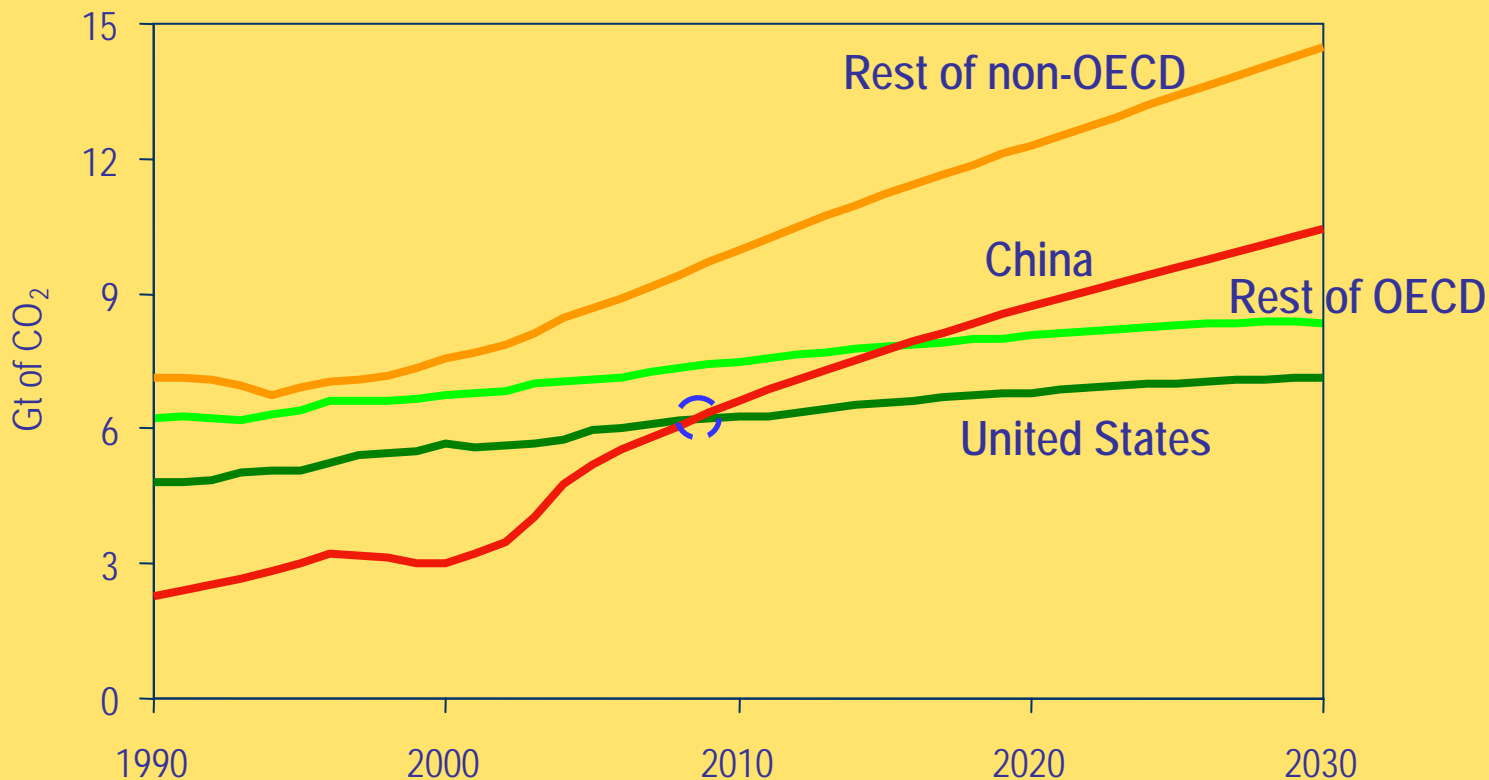
*Global demand grows by more than half over the next quarter of a century, with coal demand increasing most in absolute terms*

# Reference Scenario: Increase in World Oil Supply, 2004-2030



*As conventional non-OPEC production peaks towards the middle of next decade, the shares of OPEC & non-conventional oil increase sharply*

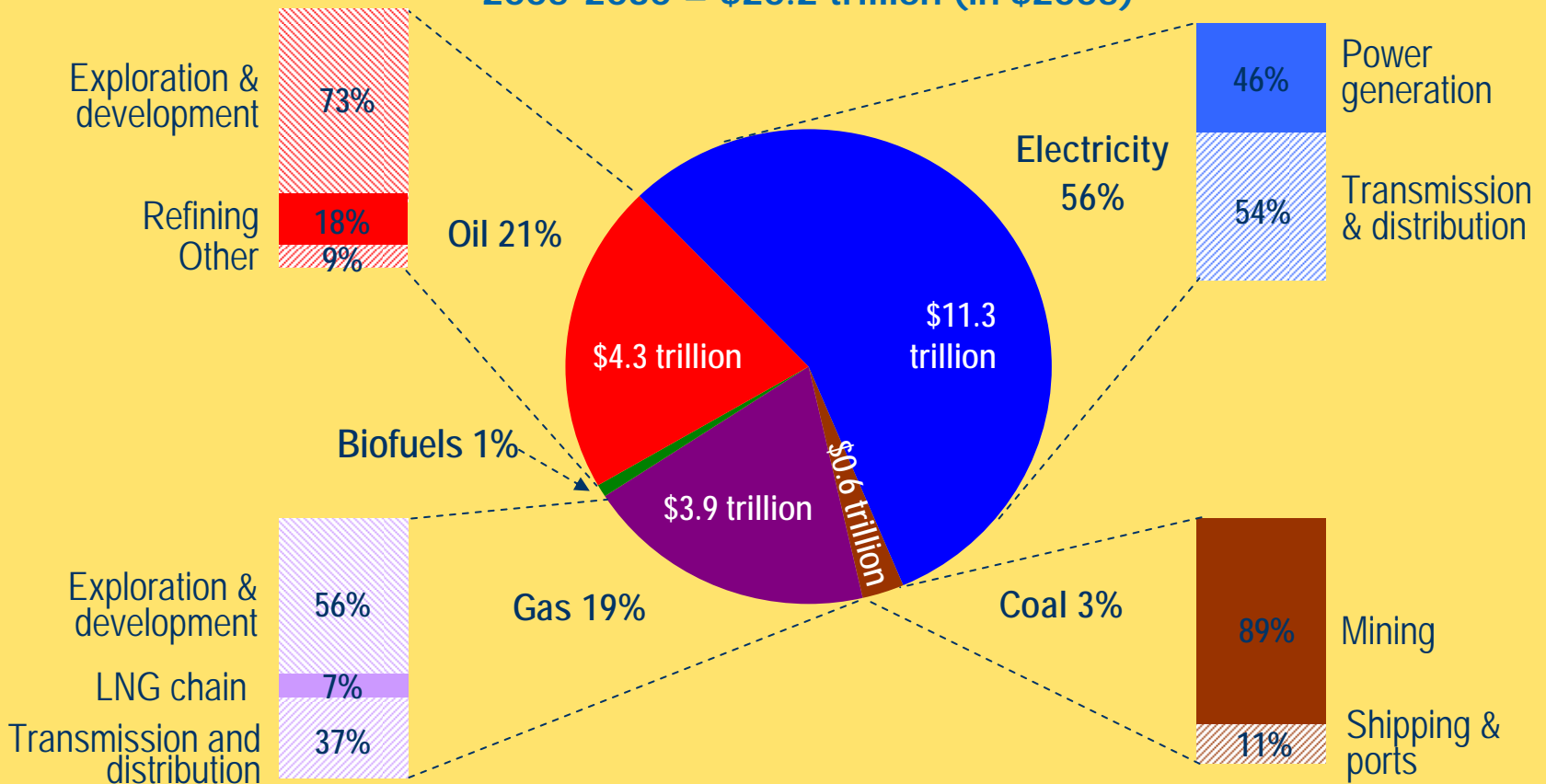
# Reference Scenario: CO<sub>2</sub> emissions by Region



***CO<sub>2</sub> emissions increase by 14.3 Gt, or 55% China overtakes the United States as the world's biggest emitter before 2010***

# The Reference Scenario: Investment

**Cumulative Investment in Energy-Supply Infrastructure,  
2005-2030 = \$20.2 trillion (in \$2005)**



***Just over half of all investment needs to 2030 are in developing countries, 18% in China alone***



- Security of oil supply is threatened
  - *Oil production in non-OPEC countries is set to peak*
  - *Production will be increasingly concentrated in a small number of countries*
- Gas security is also a growing concern
  - *US gas production will plateau by 2015*
  - *Europe's has peaked already*
  - *Import dependence in both regions & other key regions will grow absent new policies*
- Investment over the next decade will lock in technology that will remain in use for up to 60 years, even longer in the building sector

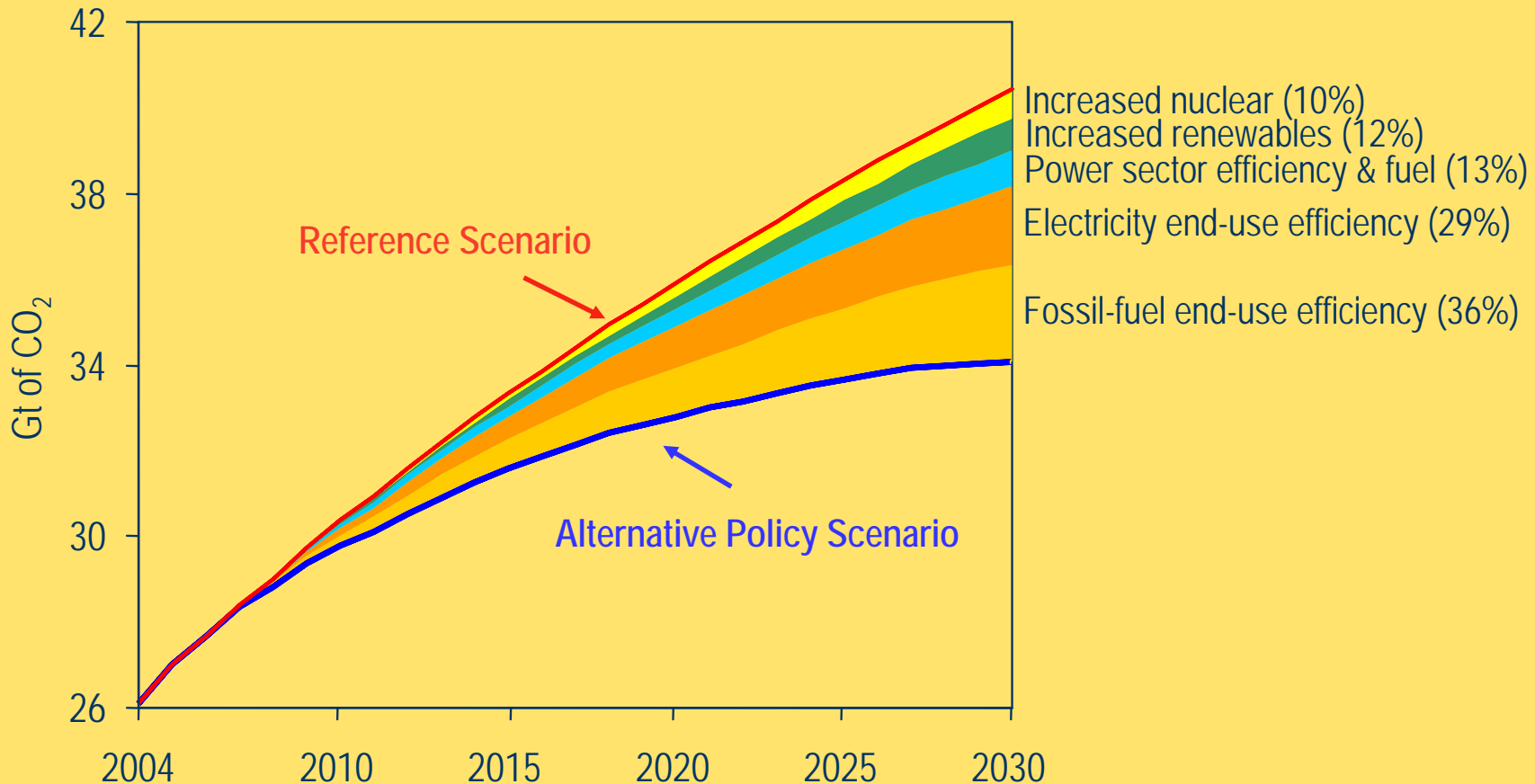


# Mapping a New Energy Future

## Energy Security and CO<sub>2</sub> Emissions

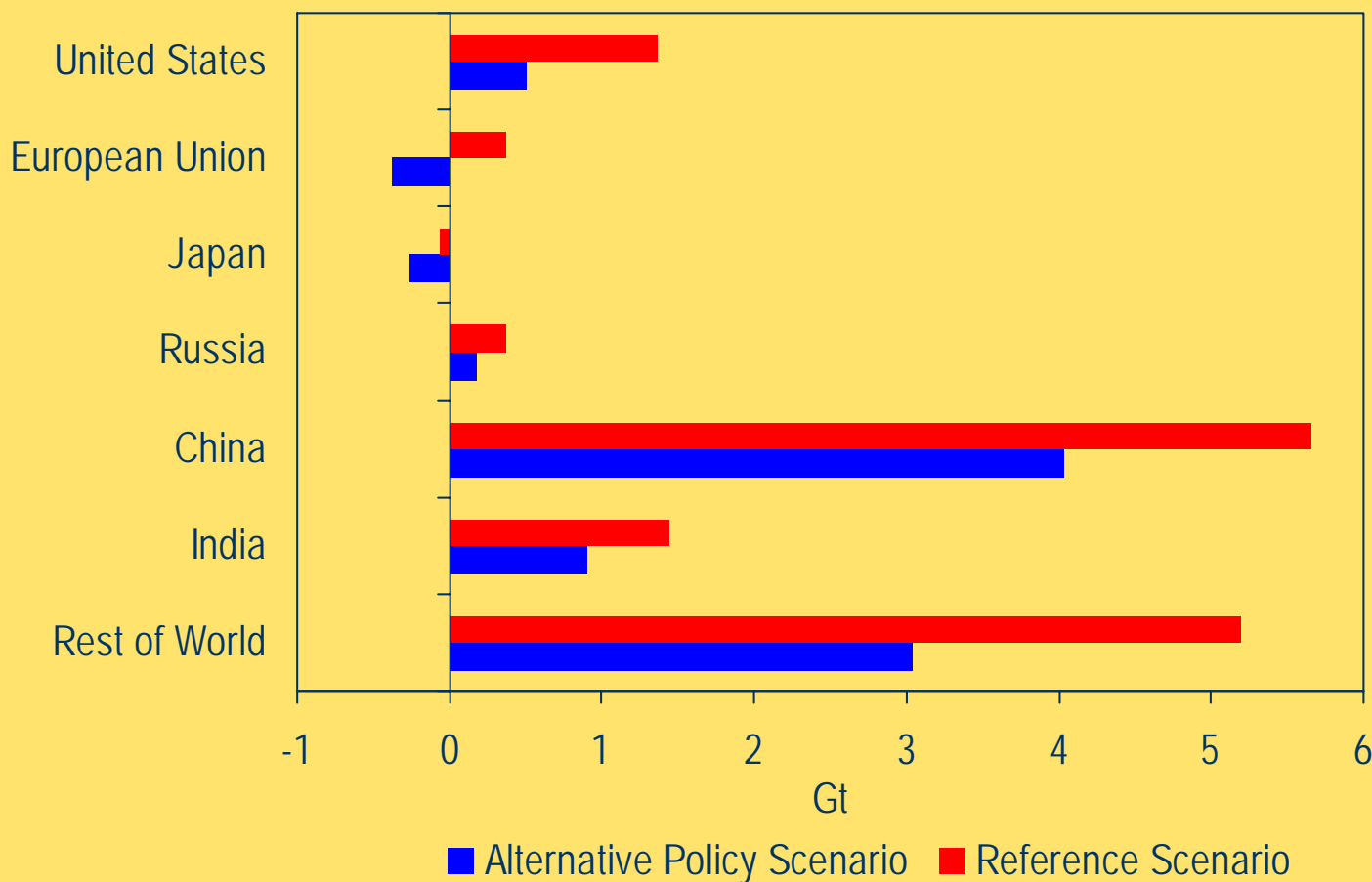
- The **Alternative Policy Scenario** analyses impact of government policies under consideration
- Responds to call to IEA from G8 & IEA ministers
  - ❑ *To “advise on alternative energy scenarios and strategies aimed at a clean, clever and competitive energy future”*
- 1 400+ different policies worldwide analysed to
  - ❑ *Improve efficiency in energy production & use*
  - ❑ *Increase reliance on non-fossil fuels*
  - ❑ *Bolster output of oil & gas in net importing countries*
- By 2030 energy demand is reduced by 10% - equivalent China's current consumption – and in 2015 savings are close to Japan's consumption
- By 2030, CO<sub>2</sub> emissions are 6.3 Gt lower

# The Alternative Policy Scenario: Global CO<sub>2</sub> Emissions Reduction



***Improved end-use efficiency accounts for two-thirds of avoided emissions in 2030 in APS***

# The Alternative Policy Scenario: Growth in CO<sub>2</sub> emissions by Region, 2004-2030



***Emissions in OECD countries peak by 2015 and then decline – to below current levels by 2030 in the EU & Japan***

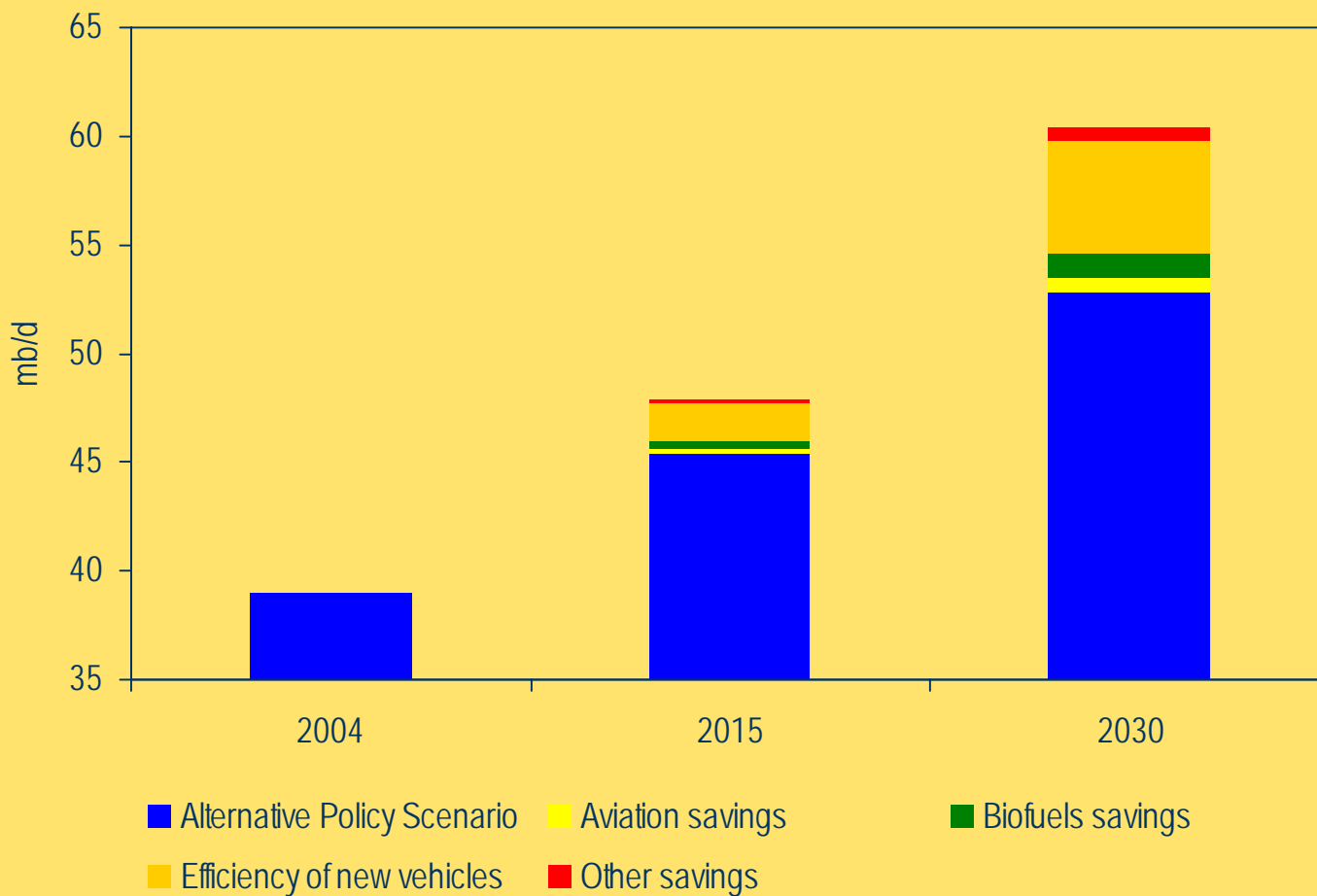
# The Alternative Policy Scenario : Key policies that Make a Global Difference



	<i>Energy efficiency</i>	<i>Power generation</i>
<b>US</b>	<ul style="list-style-type: none"> <li>● Tighter CAFE standards</li> <li>● Improved efficiency in residential &amp; commercial sectors</li> </ul>	<ul style="list-style-type: none"> <li>● Increased use of renewables</li> </ul>
<b>EU</b>	<ul style="list-style-type: none"> <li>● Increased vehicle fuel economy</li> <li>● Improved efficiency in electricity use in the residential &amp; commercial sector</li> </ul>	<ul style="list-style-type: none"> <li>● Increased use of renewables</li> <li>● Nuclear plant lifetime extensions</li> </ul>
<b>China</b>	<ul style="list-style-type: none"> <li>● Improved efficiency in electricity use in the industrial &amp; residential sectors</li> </ul>	<ul style="list-style-type: none"> <li>● Increased efficiency of coal-fired plants</li> <li>● Increased use of renewables</li> <li>● Increased reliance on nuclear</li> </ul>

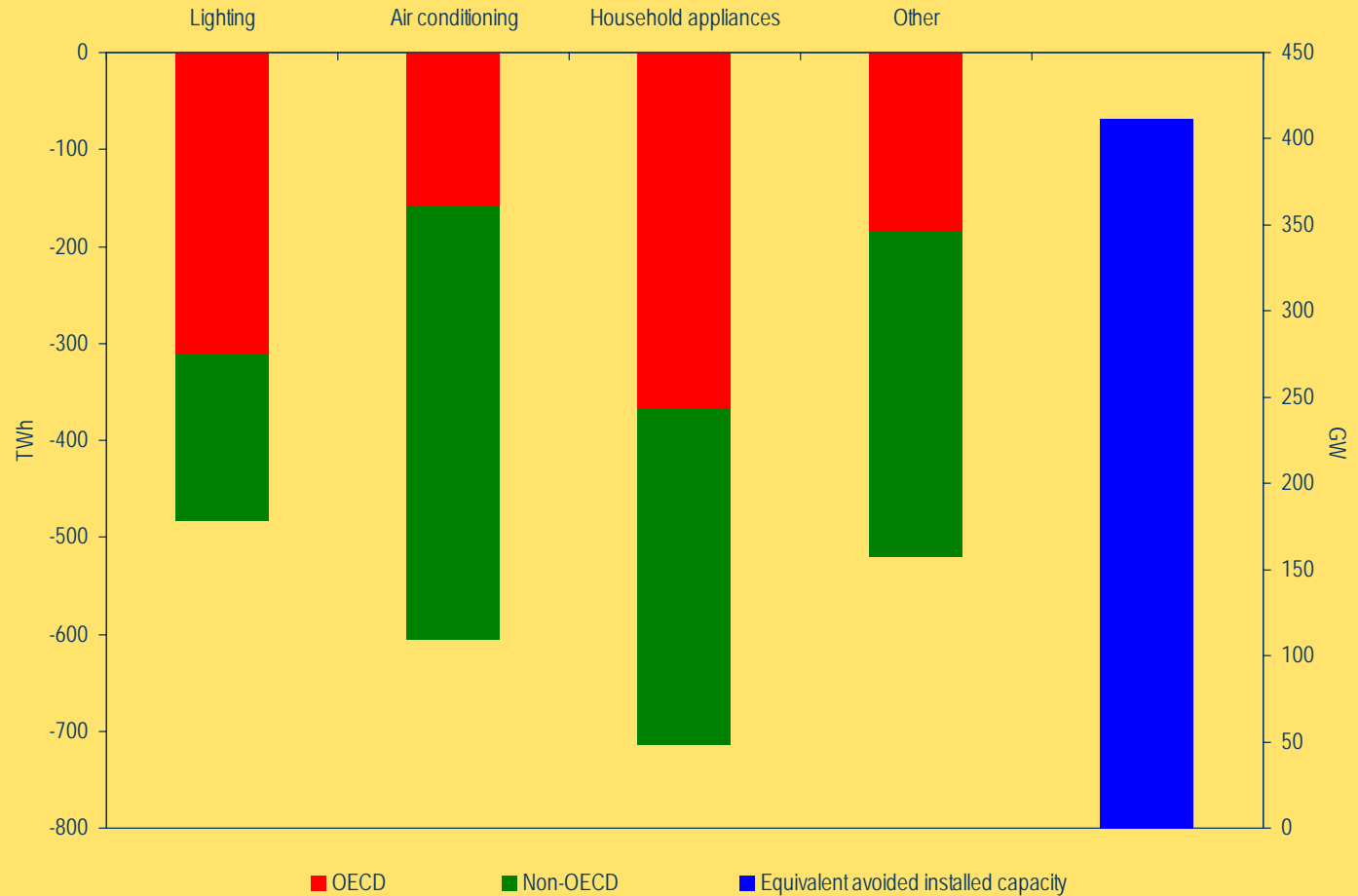
***A dozen policies in the US, EU & China account for around 40% of the global emissions reduction in 2030 in the Alternative Policy Scenario***

# The Alternative Policy Scenario: Transport Sector Oil Savings



***Improved new vehicle fuel efficiency produce more than two-thirds of the oil savings in the Alternative Policy Scenario***

# The Alternative Policy Scenario: Electricity Demand Savings in Residential and Services Sectors in 2030



*Electricity savings correspond to the total installed power capacity in China in 2004*



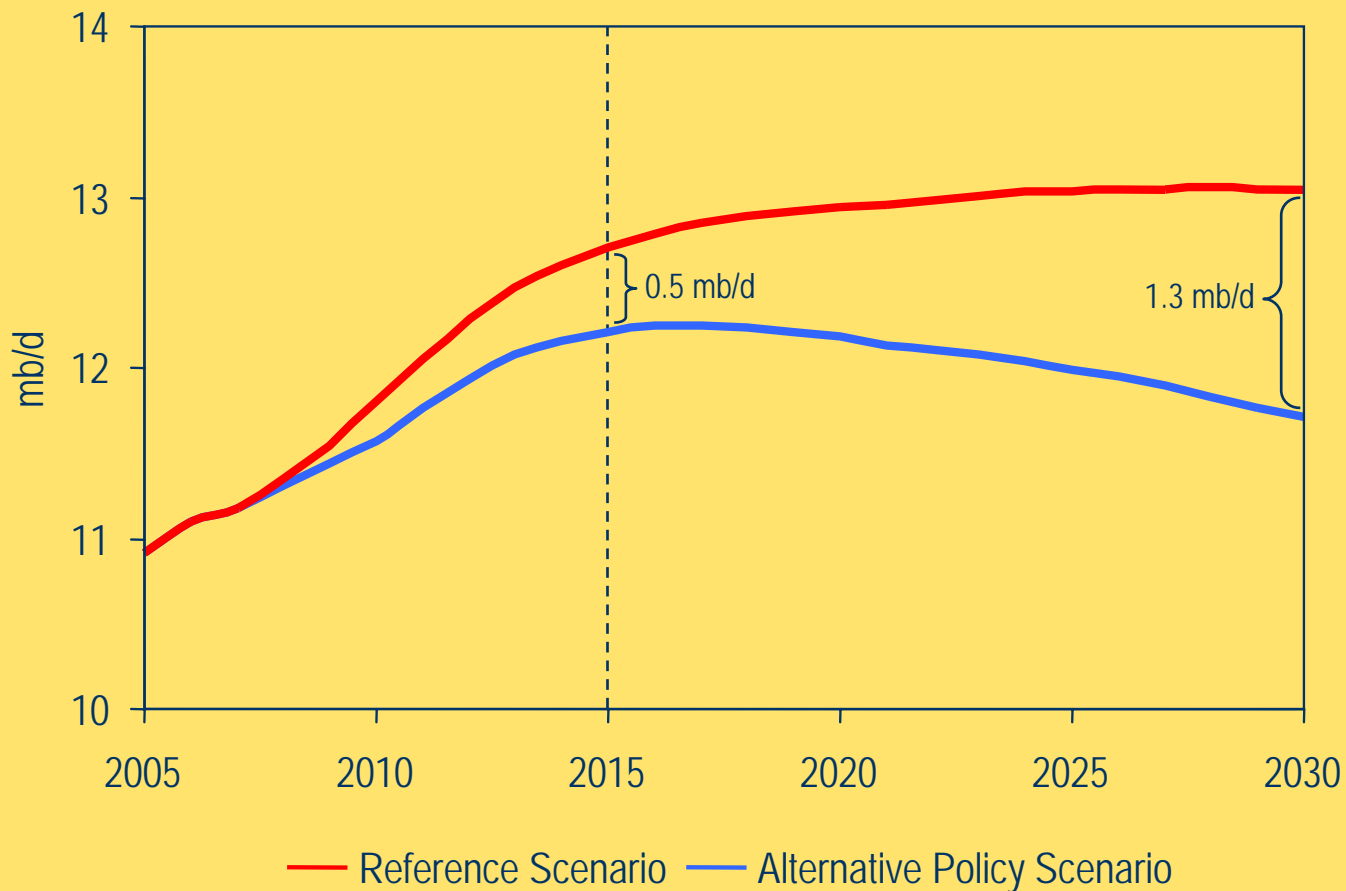
# Mapping a New Energy Future For the European Union

# European Union: Main Energy Related Policies



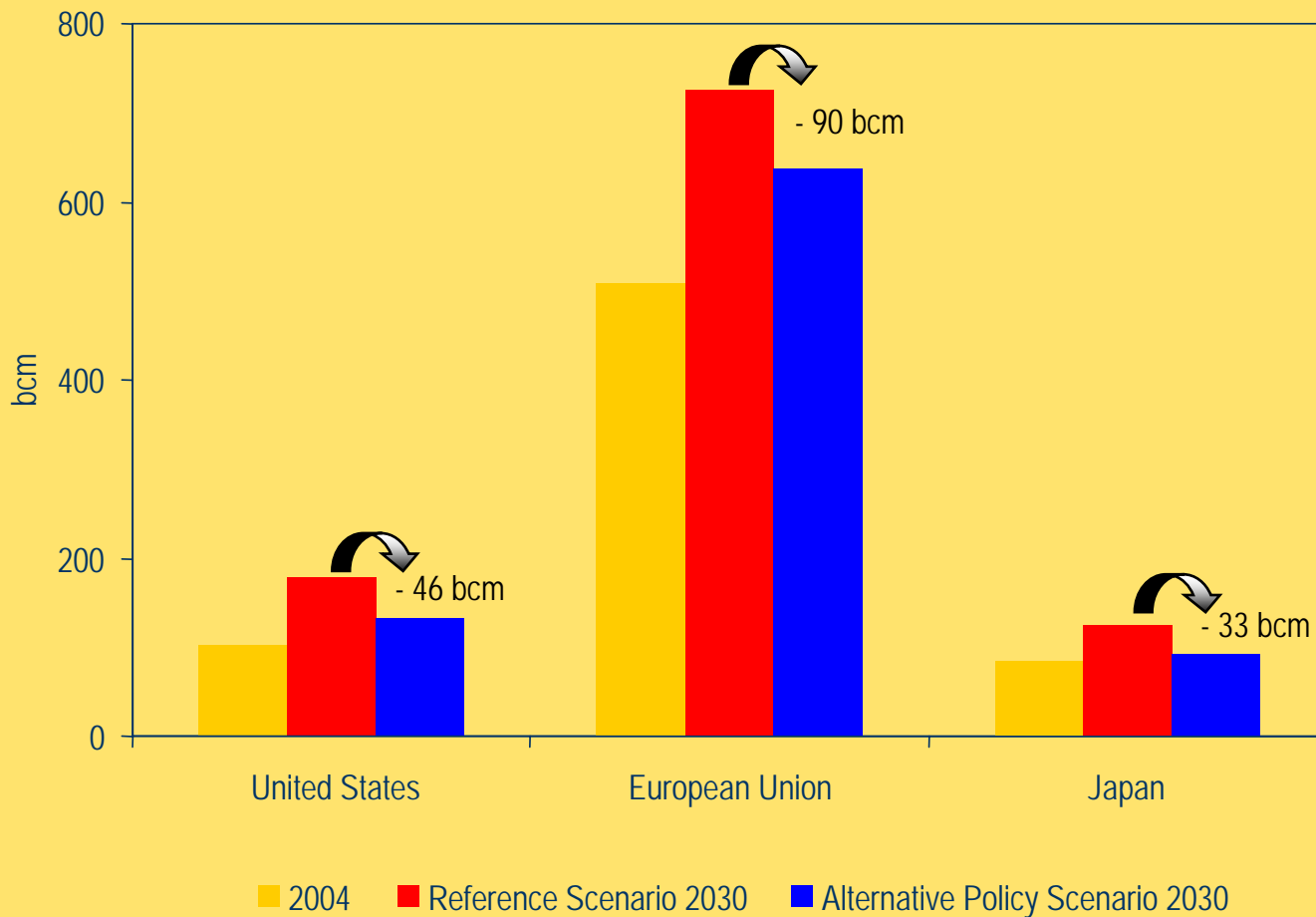
- Power Generation:
  - European Emissions Trading Scheme and linkage to Kyoto Protocol Project Mechanisms
  - Electricity Market Directive
  - Directive on Renewable Energy in Power Generation
  - Directive for the Promotion of Combined Heat and Power
- Transport:
  - Voluntary agreement with car manufacturer's associations to reduce CO<sub>2</sub> emissions from passenger cars
  - Biofuels Directive
  - Extension of Emissions Trading to aviation
- Other:
  - Green Paper on Energy Security
  - Directive on the Promotion of end-use efficiency and energy services
  - Directive on the Energy Performance of Buildings
  - Directive on the Eco-Design of Energy-using Products
  - Biomass Action Plan

# The Alternative Policy Scenario: Oil Imports in European Union



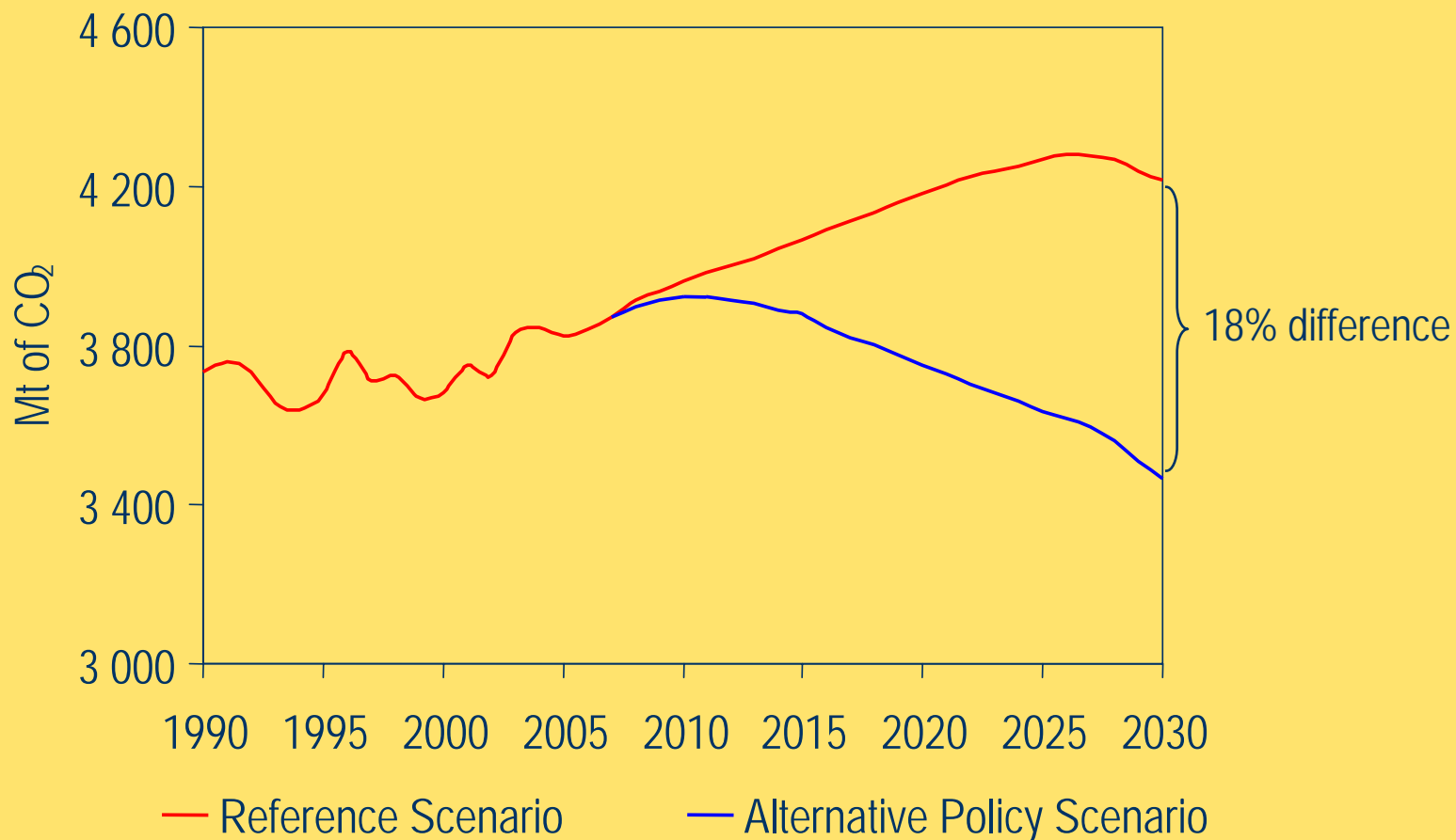
***EU oil imports plateau by 2015 and start to decline, thanks to improved car efficiency and increased use of biofuels***

# The Alternative Policy Scenario: Gas Imports, 2004-2030



***Gas imports are significantly lower in the Alternative Policy Scenario compared with the Reference Scenario***

# Focus on European Union : Energy-Related CO<sub>2</sub> emissions

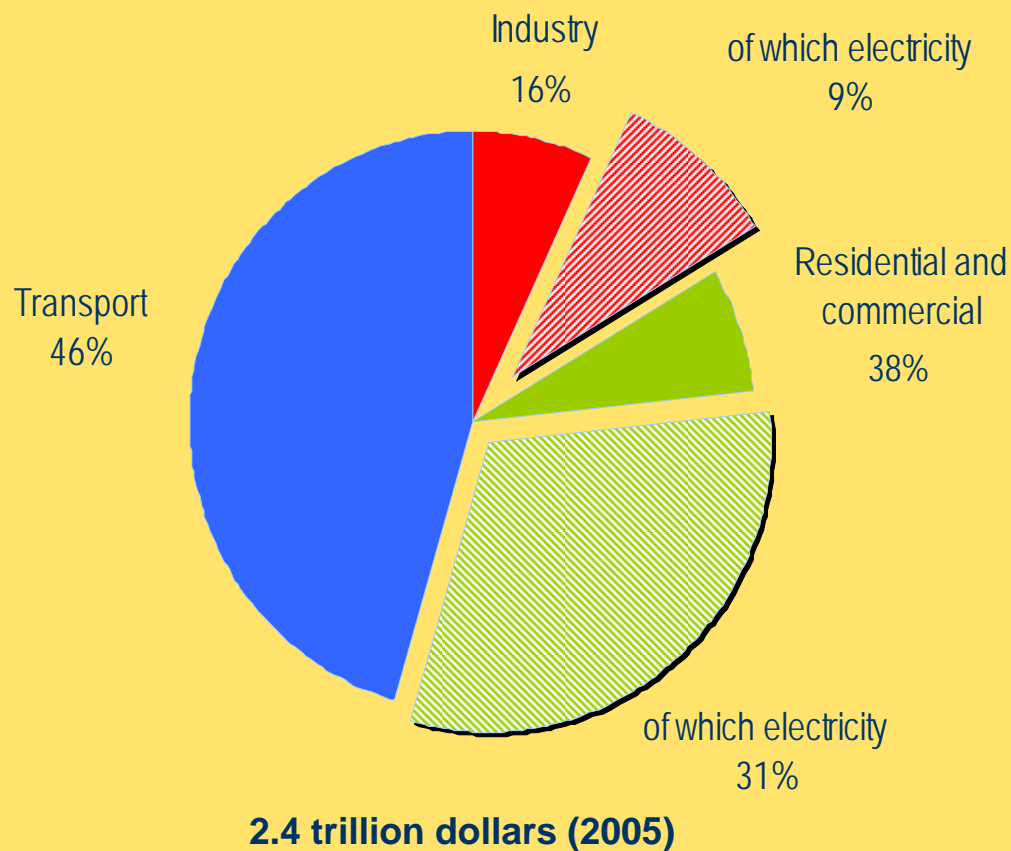


***In the Alternative Policy Scenario CO<sub>2</sub> emissions are  
are 7% below 1990 levels***



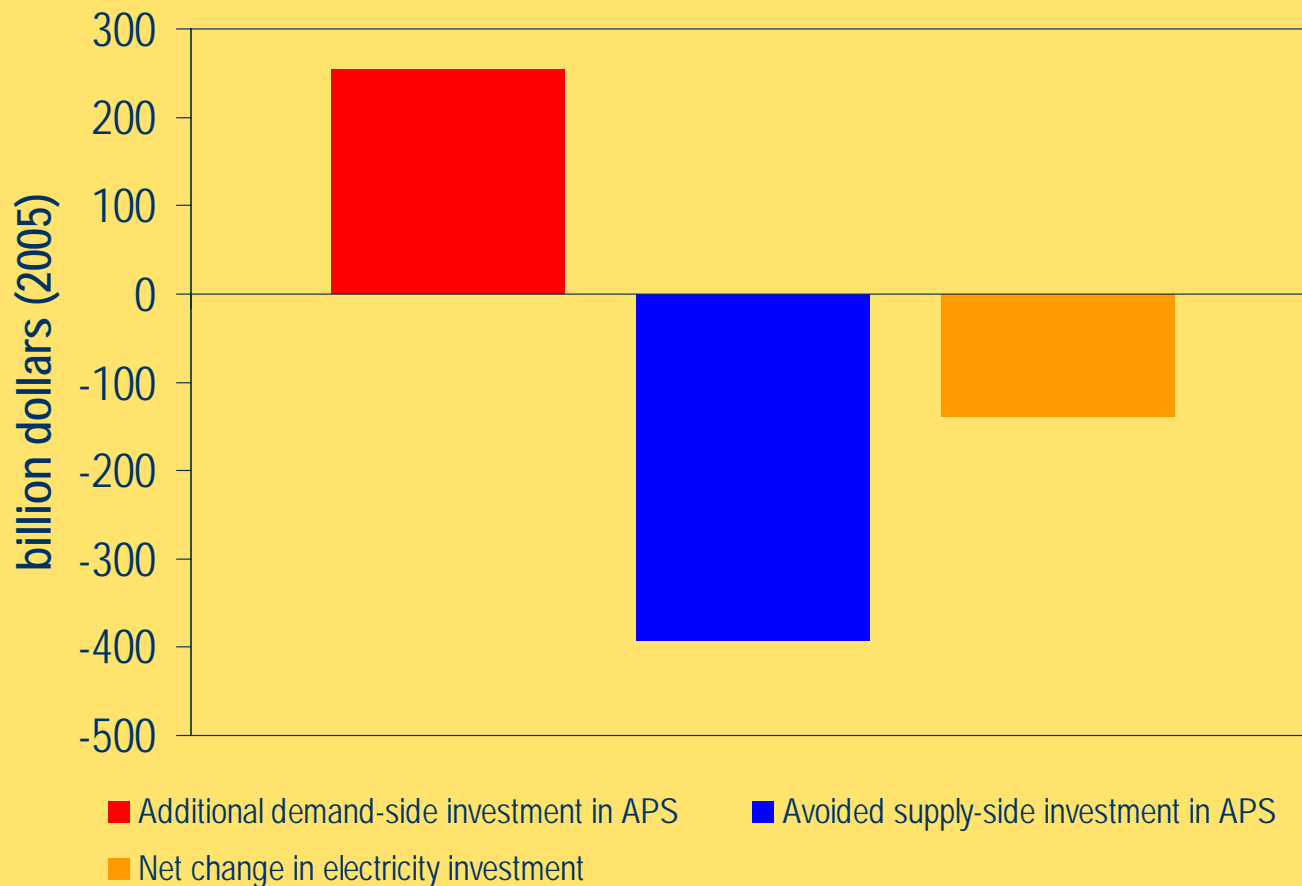
# Cost Effectiveness of Policies

# Alternative Policy Scenario: Change in End-Use Investment by Sector, 2005-2030



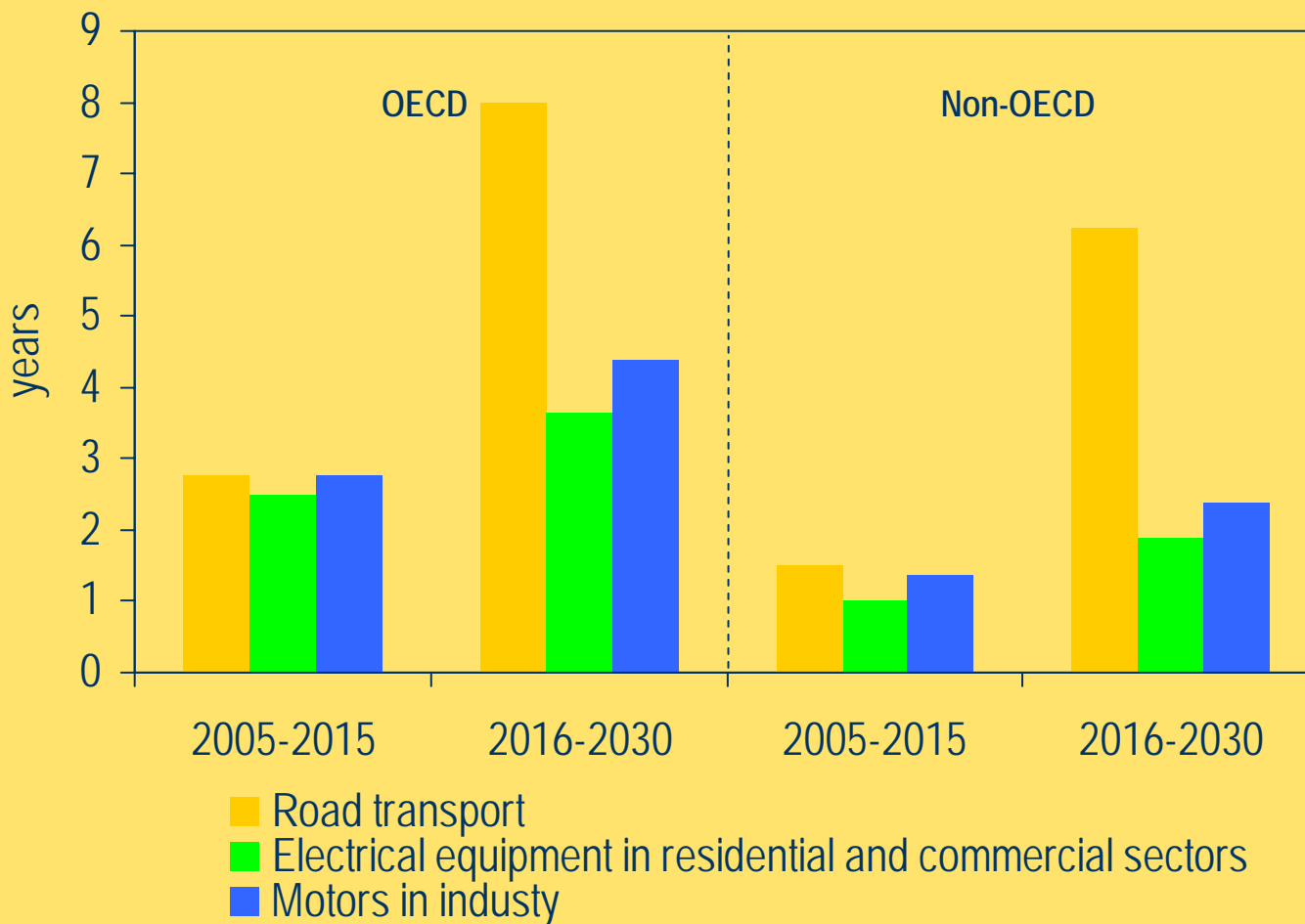
***Transport and electricity equipment account for 86% of the increase in end-use investment***

# European Union Alternative Policy Scenario Change in Electricity Investment, 2005-2030



***Overall electricity investment needs – from demand to supply side – are \$140 billion lower in the APS over the projection period***

# Alternative Policy Scenario: Payback Period of Selected Policies



***Additional investment by consumers is quickly paid back thanks to fuel savings from more efficient equipment – especially in non-OECD countries***

- On current trends, the global energy system will remain vulnerable, dirty & expensive
- Policies to promote energy efficiency in end uses, renewables & nuclear can make a significant difference
- Economic cost of these policies would be more than outweighed by the economic benefits
- Urgent government action is needed to incentivise investment in cleaner & more secure energy