International Energy Agency

WORLD ENERGY OUTLOOK 2011

World Energy Outlook 2011

Presentation to the press
London, 9 November 2011

© OECD/IEA 2011

The context: fresh challenges add to already worrying trends

WORLD ENERGY OUTLOOK 2011

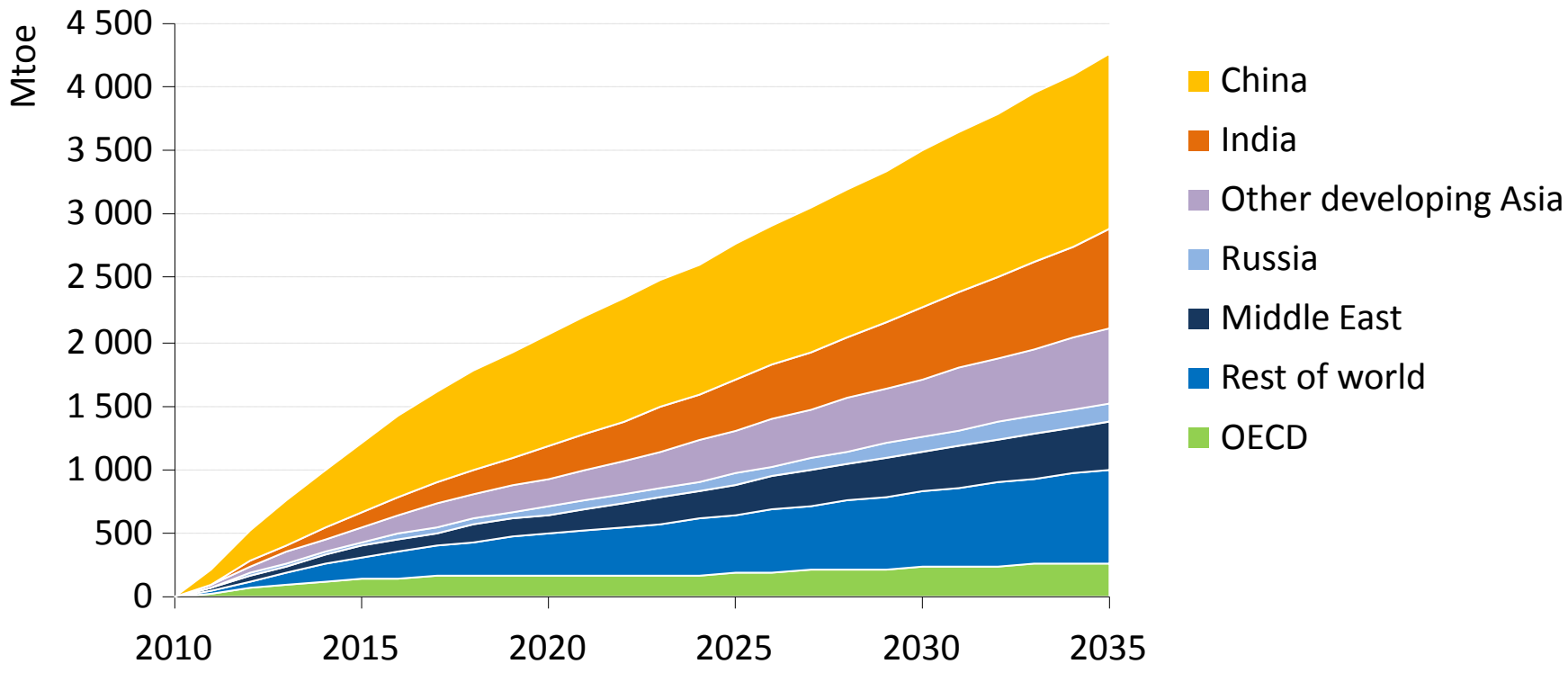
- **Economic concerns have diverted attention from energy policy and limited the means of intervention**
- **Post-Fukushima, nuclear is facing uncertainty**
- **MENA turmoil raised questions about region's investment plans**
- **Some key trends are pointing in worrying directions:**
  - *CO_2 emissions rebounded to a record high*
  - *energy efficiency of global economy worsened for 2nd straight year*
  - *spending on oil imports is near record highs*

© OECD/IEA 2011

Emerging economies continue to drive global energy demand

WORLD ENERGY OUTLOOK 2011

Growth in primary energy demand in the New Policies Scenario

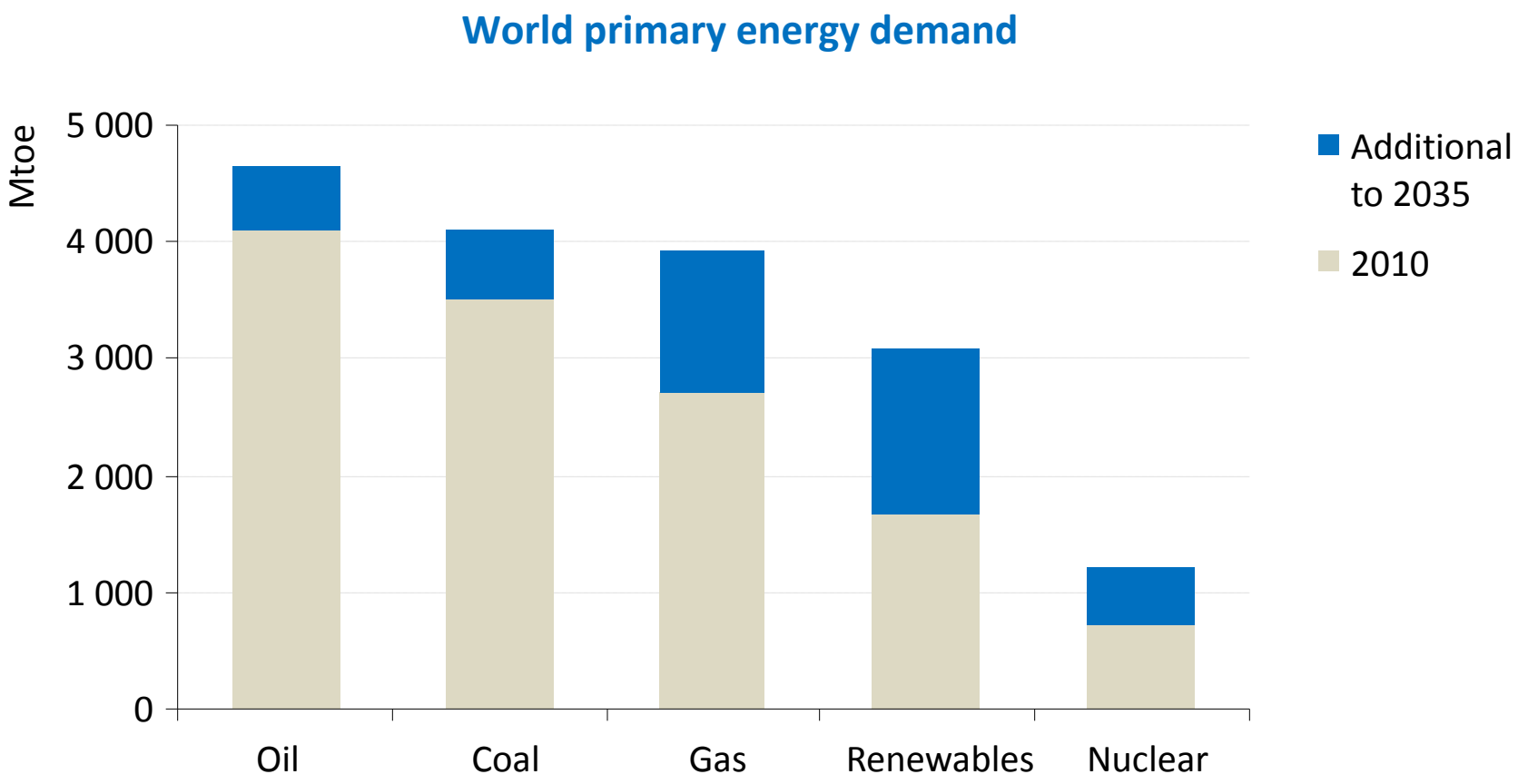


Global energy demand increases by one-third from 2010 to 2035, with China & India accounting for 50% of the growth

© OECD/IEA 2011

Natural gas & renewables become increasingly important

WORLD ENERGY OUTLOOK 2011

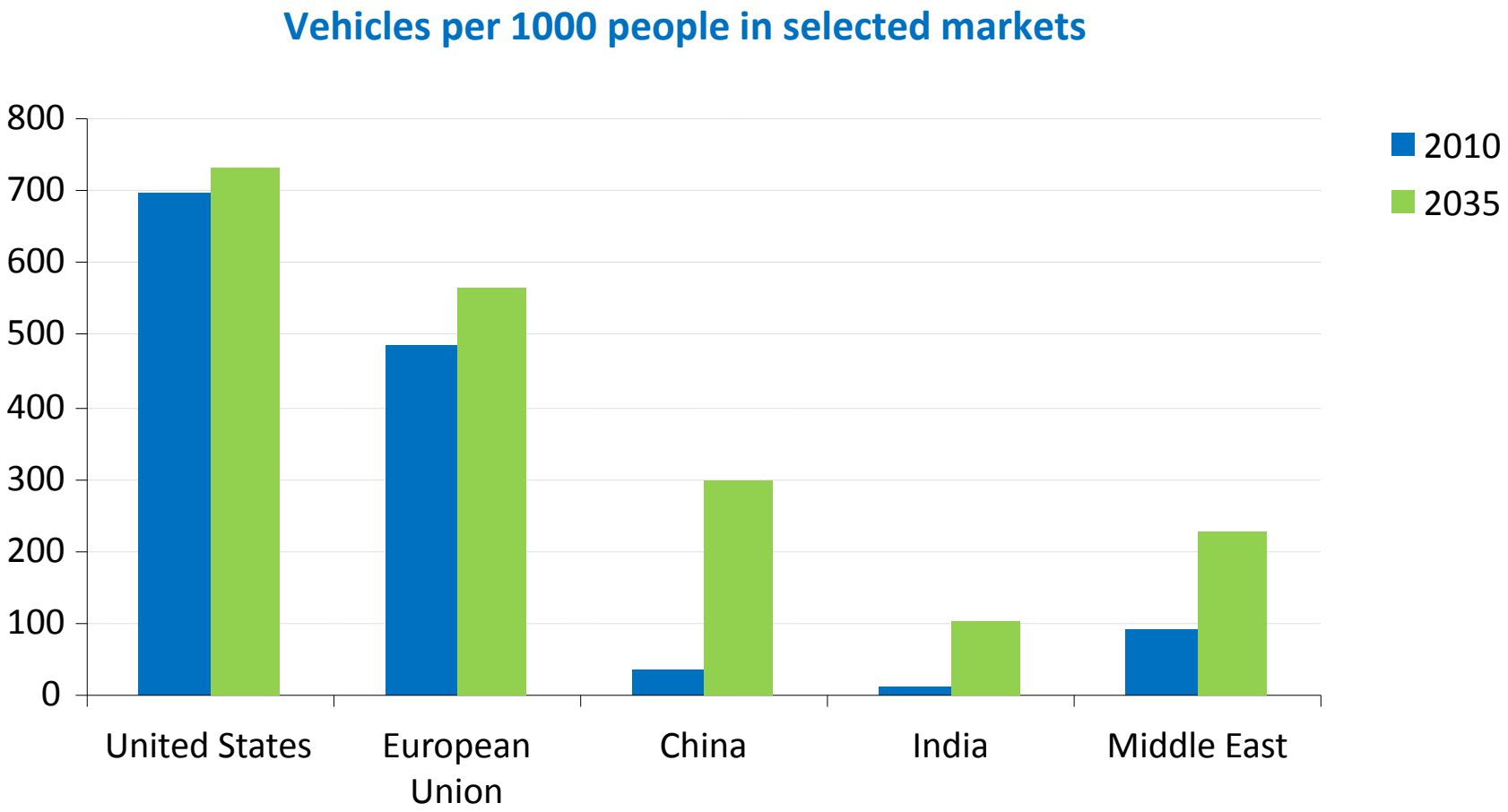


Renewables & natural gas collectively meet almost two-thirds of incremental energy demand in 2010-2035

© OECD/IEA 2011

Oil demand is driven higher by soaring car ownership

WORLD ENERGY OUTLOOK 2011

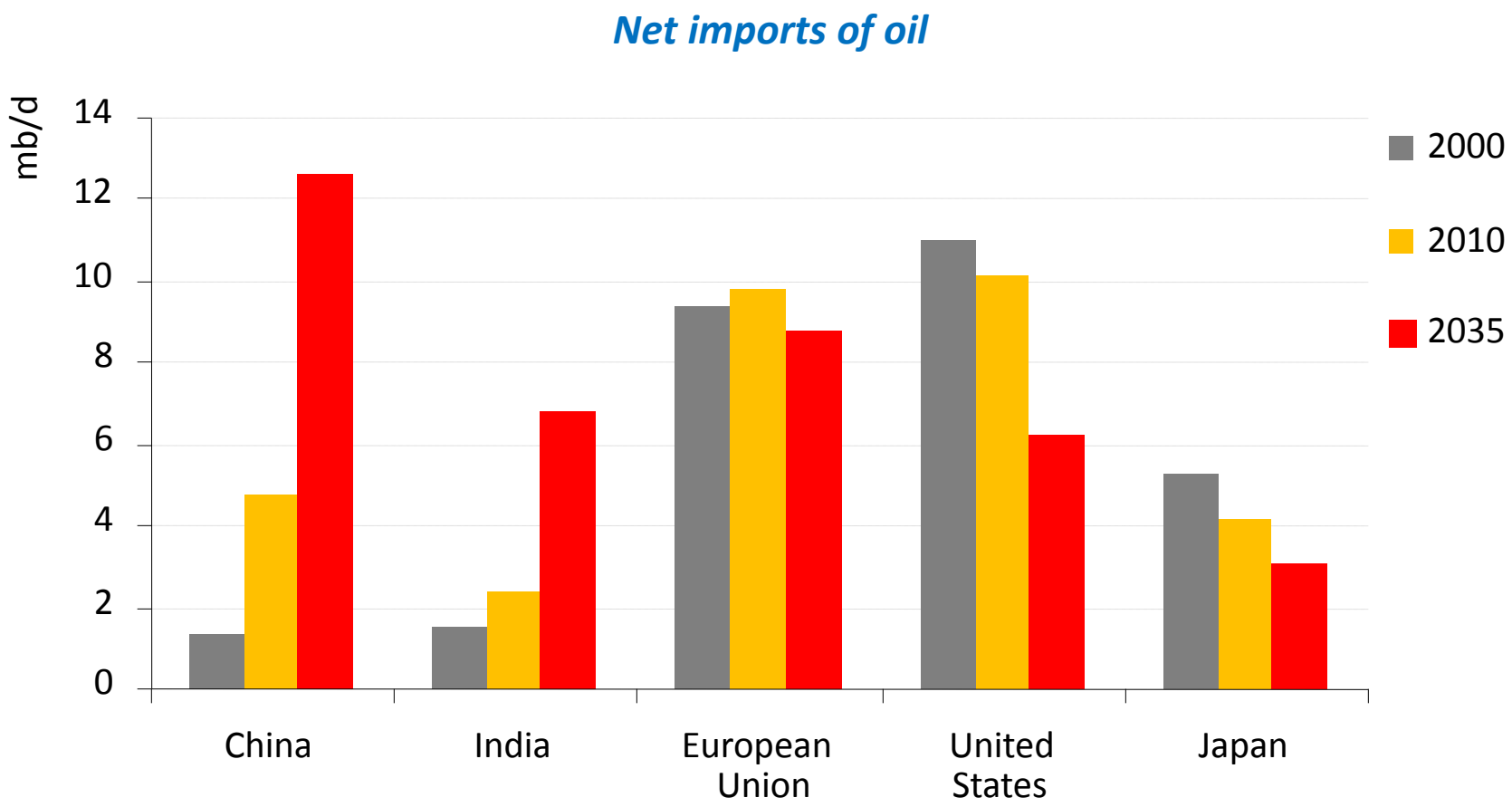


The passenger vehicle fleet doubles to 1.7 billion in 2035; most cars are sold outside the OECD by 2020, making non-OECD policies key to global oil demand

© OECD/IEA 2011

Changing oil import needs are set to shift concerns about oil security

WORLD ENERGY OUTLOOK 2011



US oil imports drop due to rising domestic output & improved transport efficiency: EU imports overtake those of the US around 2015; China becomes the largest importer around 2020

© OECD/IEA 2011

What impact would deferred investment in MENA have on markets?

WORLD ENERGY OUTLOOK 2011

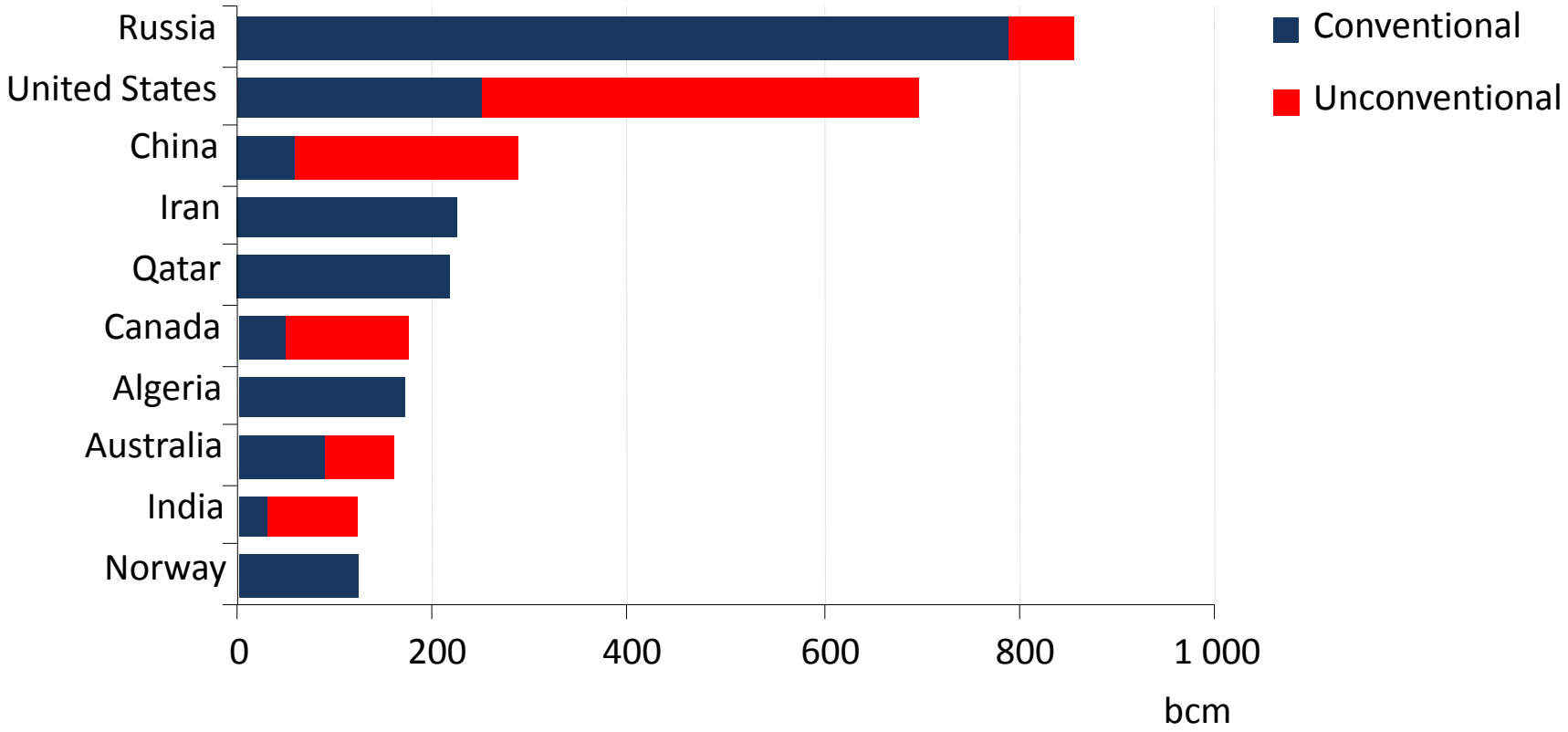
- **MENA is set to supply the bulk of the growth in oil output to 2035, requiring investment of over $100 billion/annum**
- **'Deferred Investment Case' looks at near-term investment falling short by one-third**
  - ***possible drivers include new spending priorities, higher perceived risks, etc***
- **MENA output falls 3.4 mb/d by 2015 and 6.2 mb/d by 2020**
- **Consumers face a near-term rise in oil prices to $150/barrel**
- **MENA earns more initially, but then less as market share is lost**

© OECD/IEA 2011

Golden prospects for natural gas

WORLD ENERGY OUTLOOK 2011

Largest natural gas producers in 2035

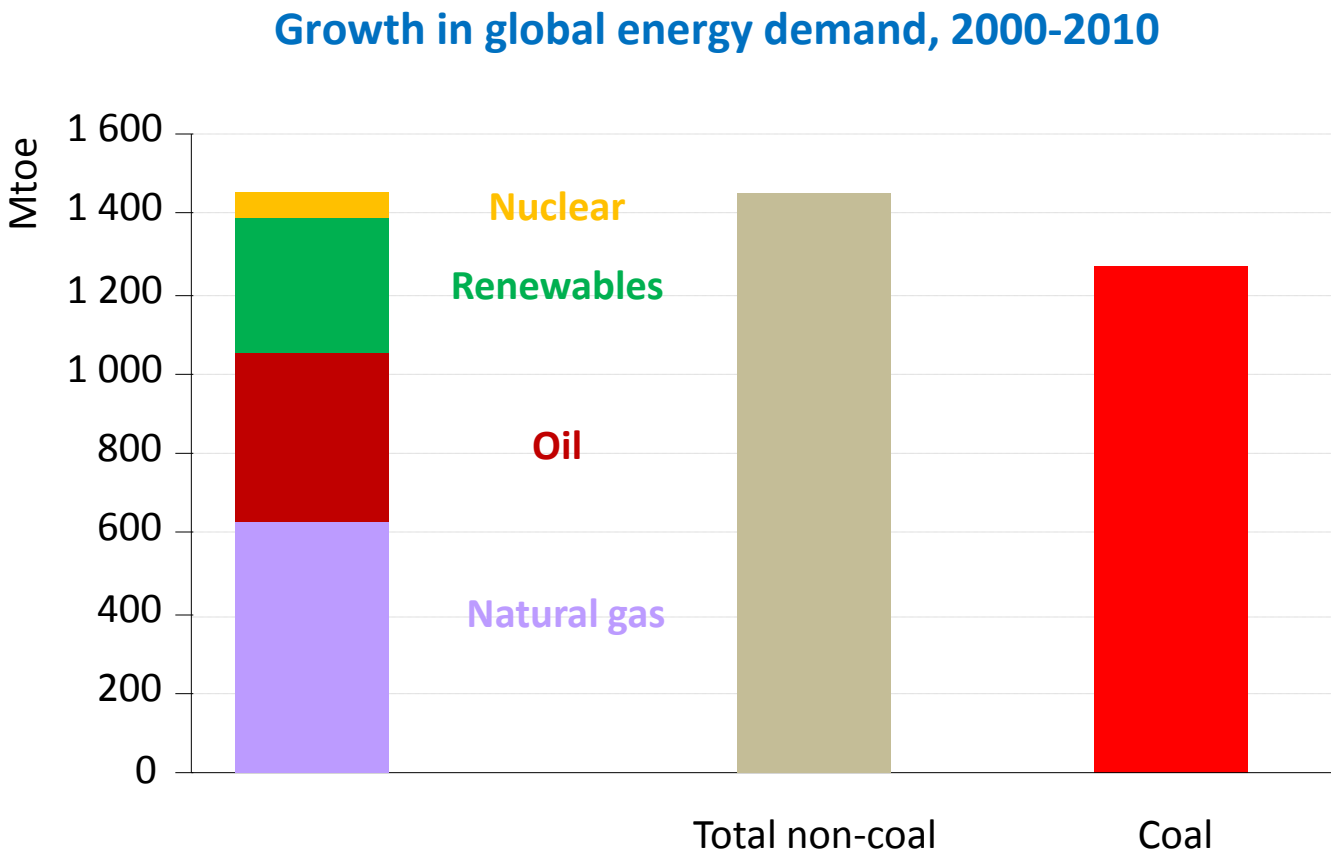


Unconventional natural gas supplies 40% of the 1.7 tcm increase in global supply, but best practices are essential to successfully address environmental challenges

© OECD/IEA 2011

Coal won the energy race in the first decade of the 21st century

WORLD ENERGY OUTLOOK 2011

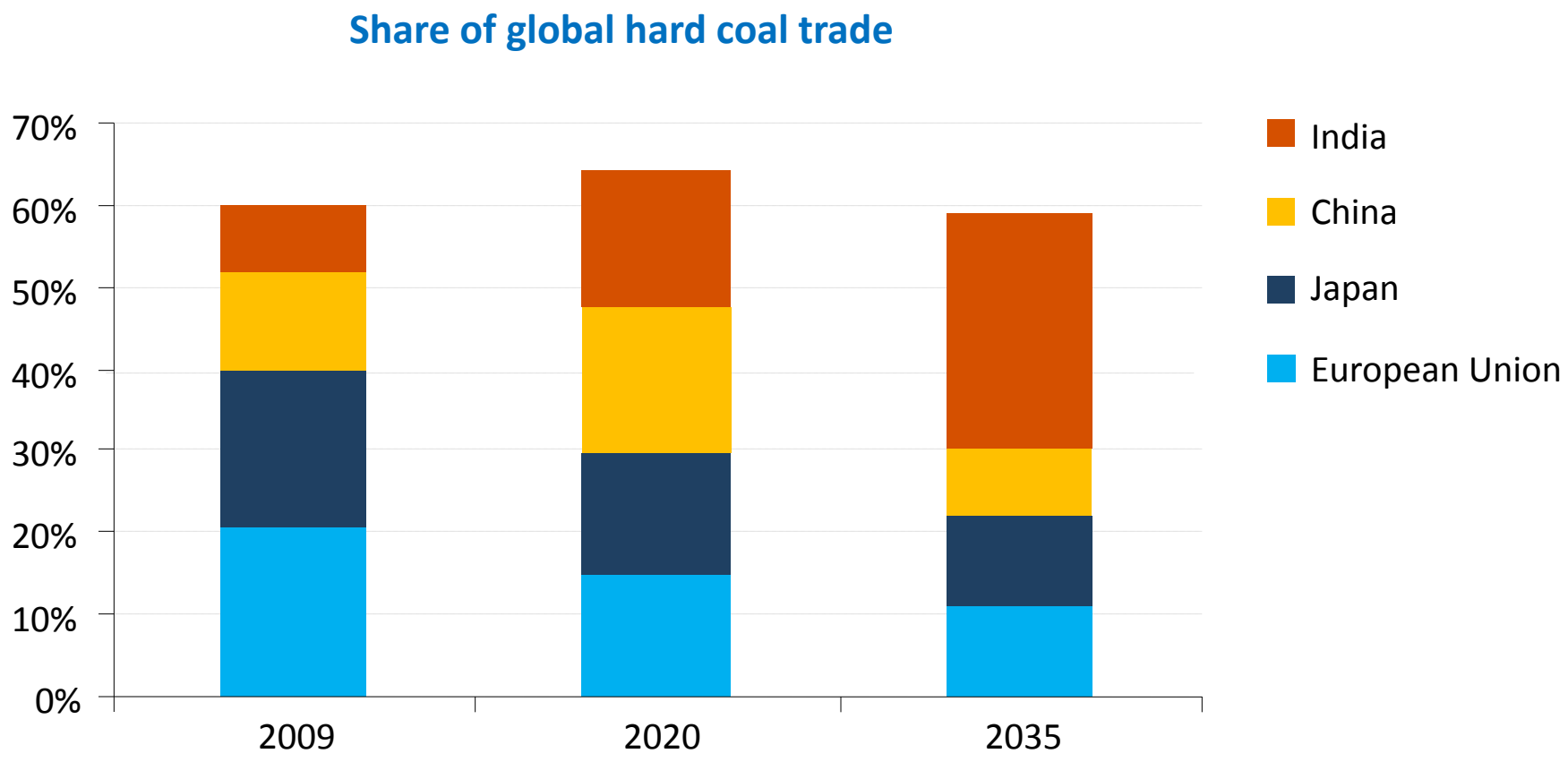


Coal accounted for nearly half of the increase in global energy use over the past decade, with the bulk of the growth coming from the power sector in emerging economies

© OECD/IEA 2011

Asia: the arena of future coal trade

WORLD ENERGY OUTLOOK 2011



International coal markets & prices become increasingly sensitive to developments in Asia; India surpasses China as the biggest coal importer soon after 2020

© OECD/IEA 2011

Second thoughts on nuclear would have far-reaching consequences

WORLD ENERGY OUTLOOK 2011

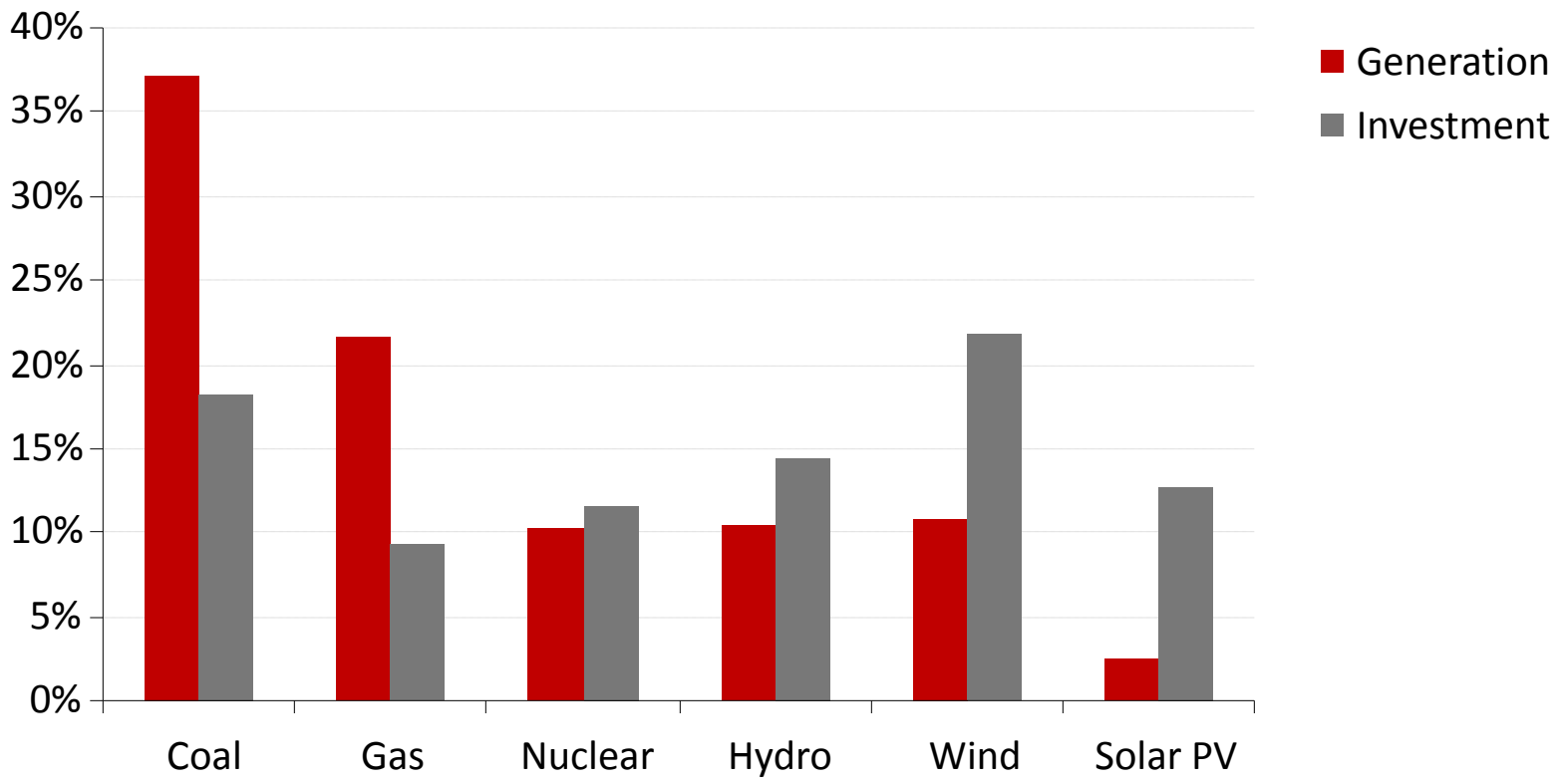
- **"Low Nuclear Case" examines impact of nuclear component of future energy supply being cut in half**
- **Gives a boost to renewables, but increases import bills, reduces diversity & makes it harder to combat climate change**
- **By 2035, compared with the New Policies Scenario:**
  - *coal demand increases by twice Australia's steam coal exports*
  - *natural gas demand increases by two-thirds Russia's natural gas net exports*
  - *power- sector CO_2 emissions increase by 6.2%*
- **Biggest implications are for countries with limited energy resources that planned to rely on nuclear power**

© OECD/IEA 2011

Power investment focuses on low-carbon technologies

WORLD ENERGY OUTLOOK 2011

Share of new power generation and investment, 2011-2035

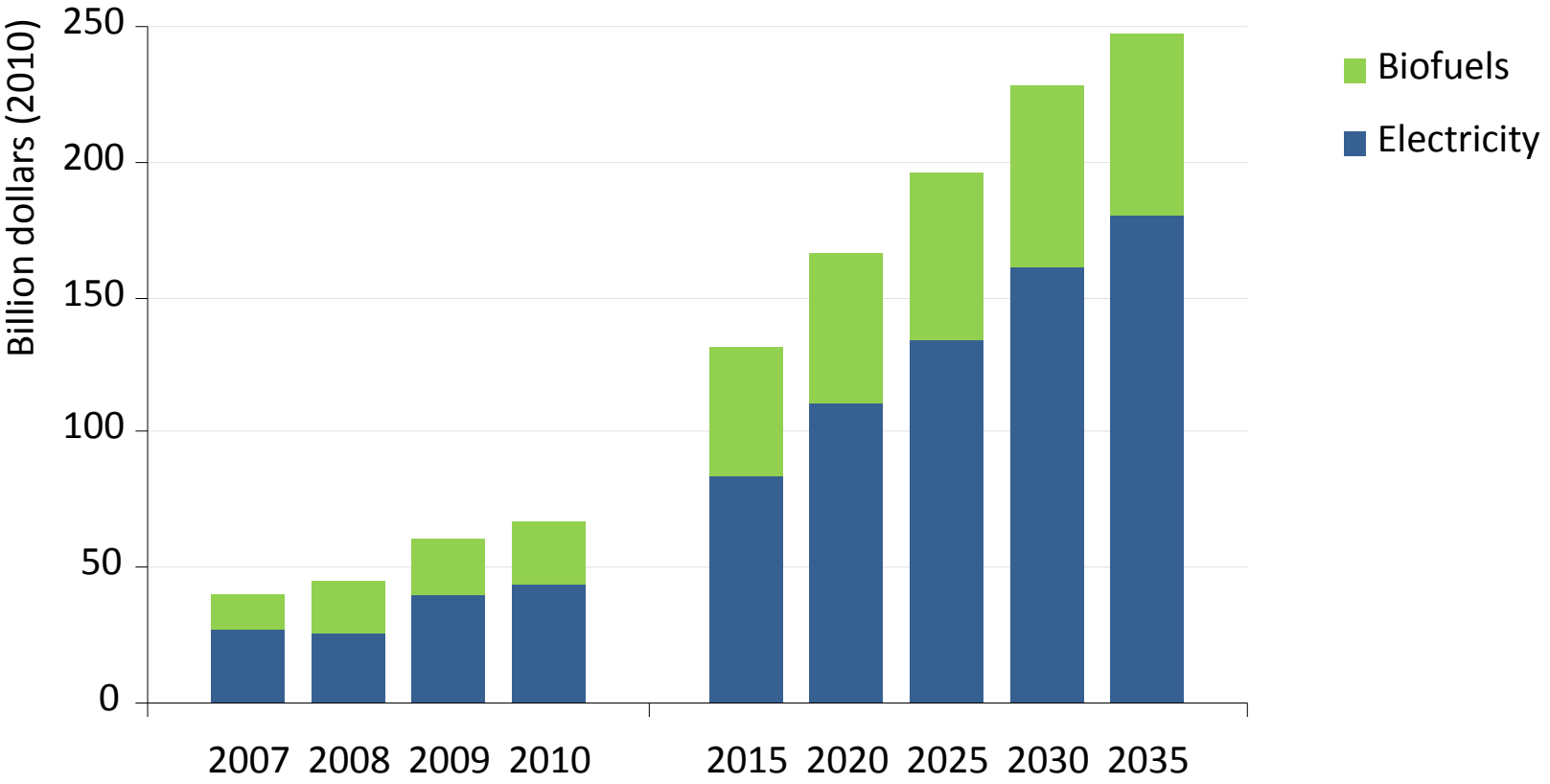


Renewables are often capital-intensive, representing 60% of investment for 30% of additional generation, but bring environmental benefits & have minimal fuel costs

© OECD/IEA 2011

The overall value of subsidies to renewables is set to rise

WORLD ENERGY OUTLOOK 2011

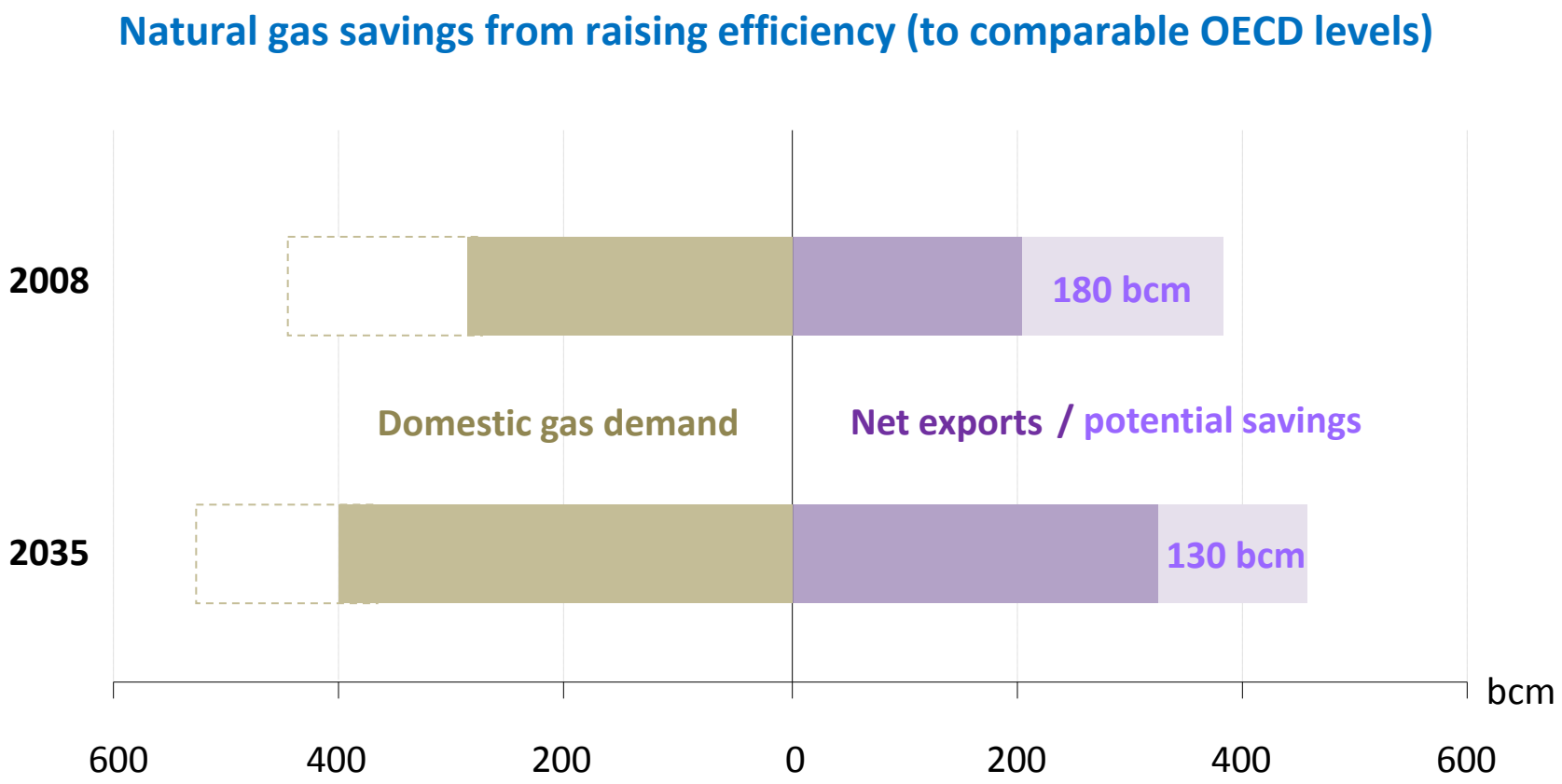


Renewable subsidies of $66 billion in 2010 (compared with $409 billion for fossil fuels), need to climb to $250 billion in 2035 as rising deployment outweighs improved competitiveness

© OECD/IEA 2011

Realising Russia's potential for energy savings would have a big impact

WORLD ENERGY OUTLOOK 2011



Russia's total energy savings potential is close to the primary energy used in a year by the UK; new efficiency policies bring results, but the savings potential remains large even in 2035

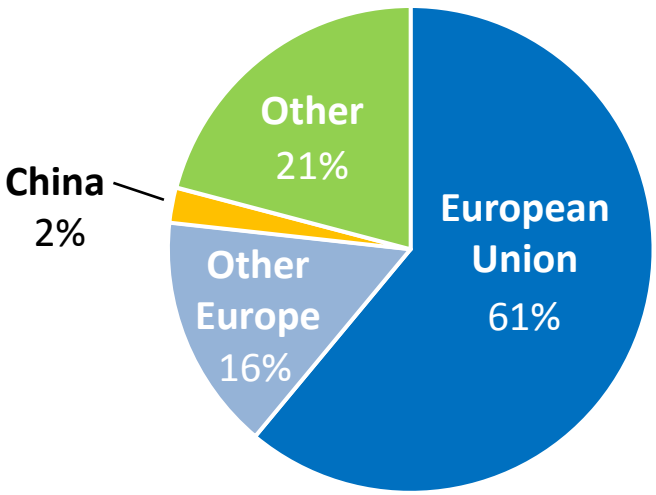
© OECD/IEA 2011

Russia remains a cornerstone of the global energy economy

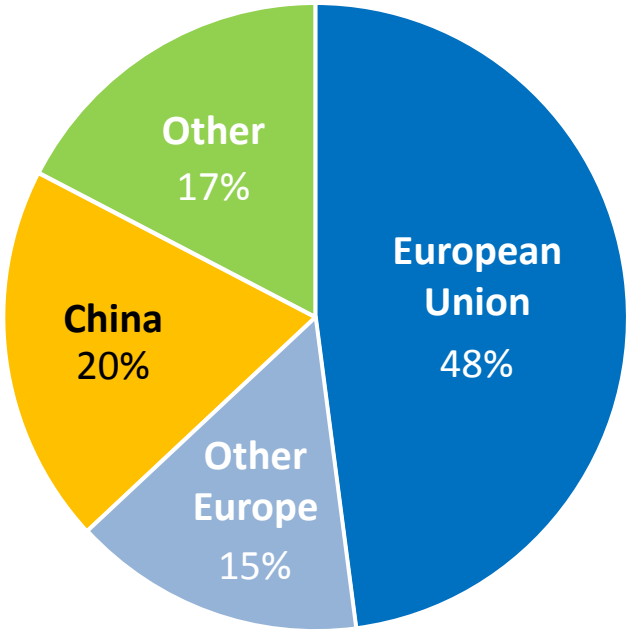
WORLD ENERGY OUTLOOK 2011

Russian revenue from fossil fuel exports

2010
$255 billion



2035
$420 billion

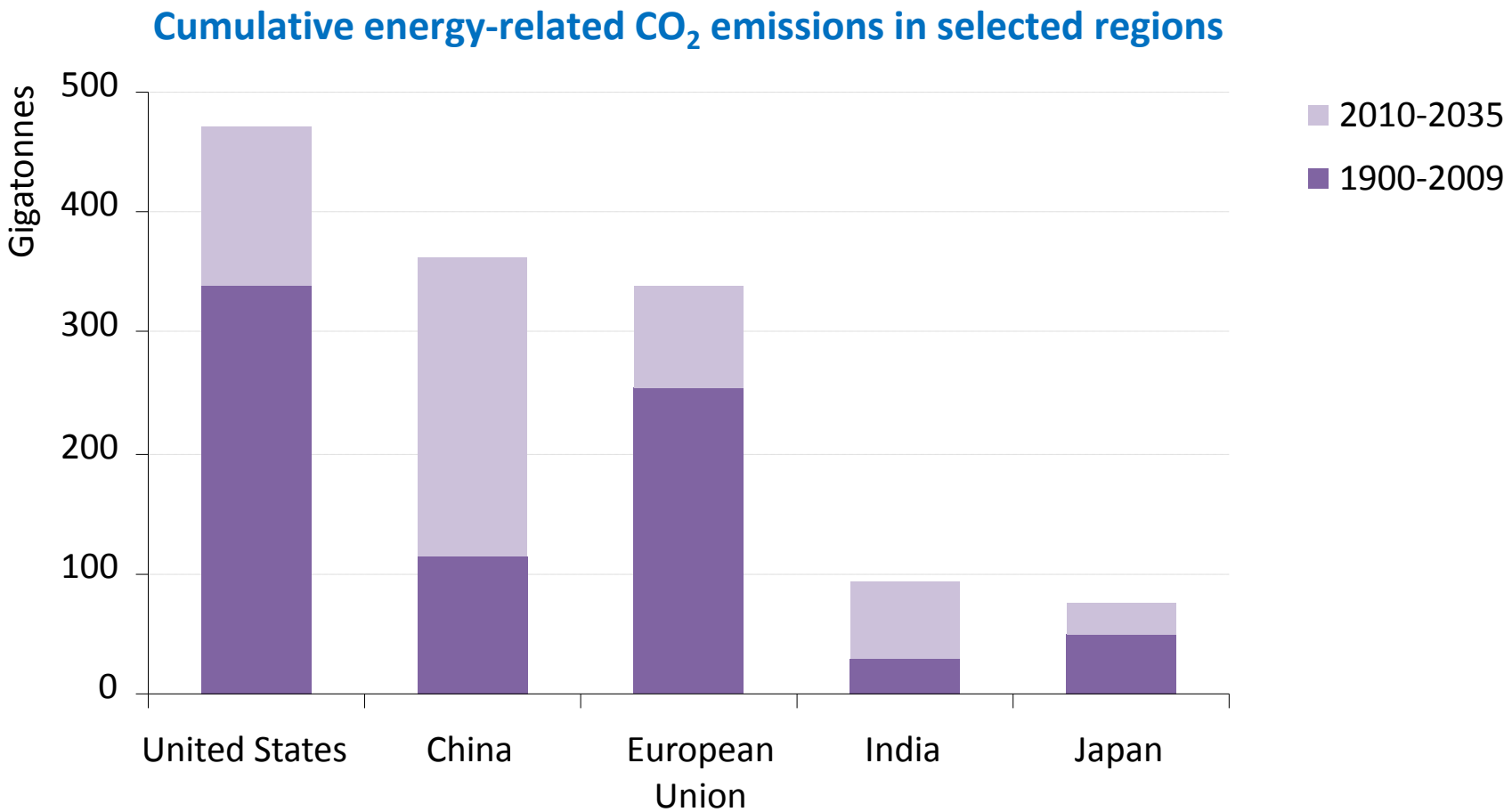


An increasing share of Russian exports go eastwards to Asia, providing Russia with diversity of markets and revenues

© OECD/IEA 2011

Energy is at the heart of the climate challenge

WORLD ENERGY OUTLOOK 2011

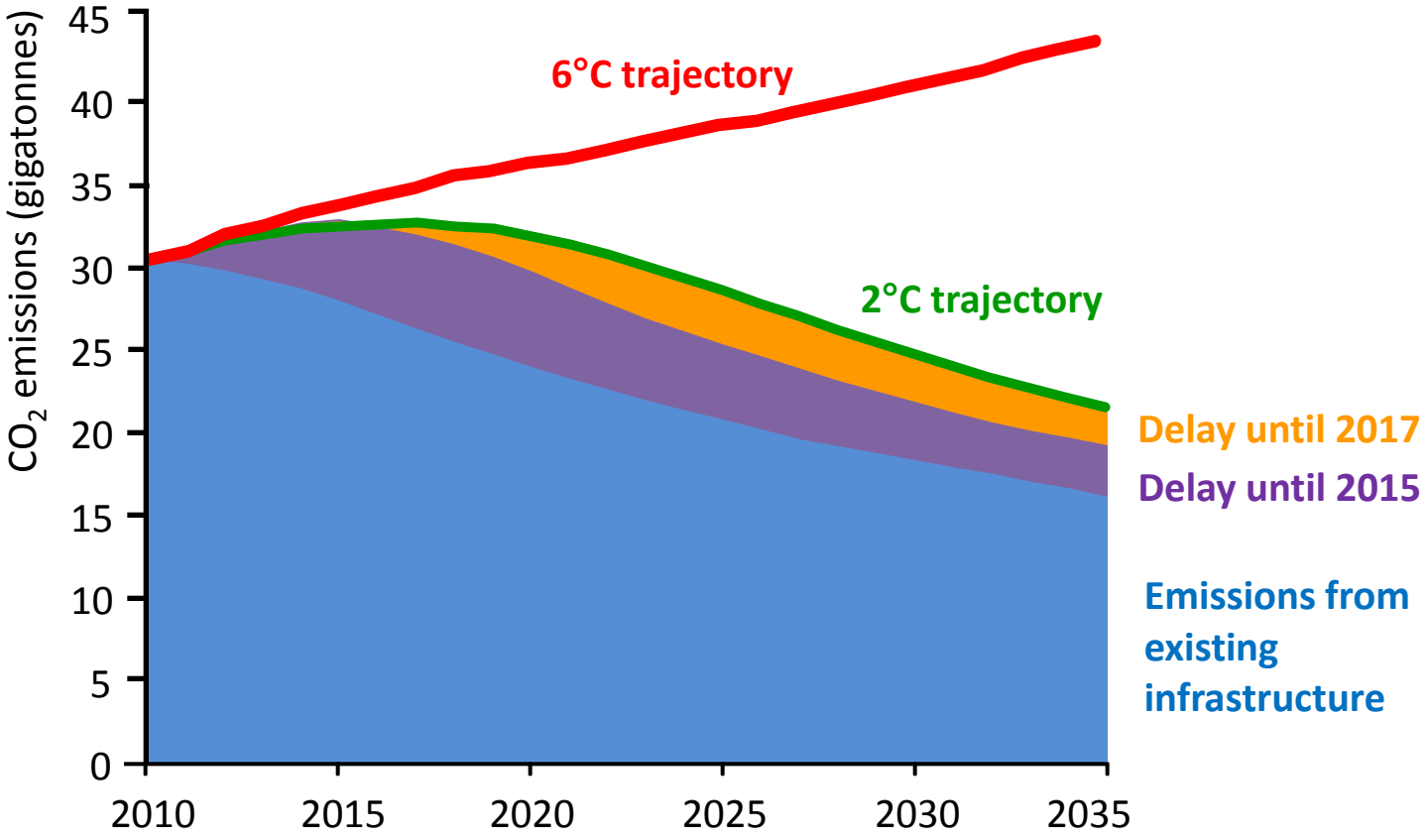


By 2035, cumulative CO_2 emissions from today exceed three-quarters of the total since 1900, and China's per-capita emissions match the OECD average

© OECD/IEA 2011

The door to 2°C is closing, but will we be "locked-in" ?

WORLD ENERGY OUTLOOK 2011



Without further action, <u>by 2017</u> all CO_2 emissions permitted in the 450 Scenario will be "locked-in" by existing power plants, factories, buildings, etc

© OECD/IEA 2011

If we don't change direction soon, we'll end up where we're heading

WORLD ENERGY OUTLOOK 2011

- In a world full of uncertainty, one thing is sure: rising incomes & population will push energy needs higher
- Oil supply diversity is diminishing, while new options are opening up for natural gas
- Coal – the "forgotten fuel" – has underpinned growth, but its future will be shaped by uptake of efficient power plants & CCS
- Power sector investment will become increasingly capital intensive with the rising share of renewables
- The world needs Russian energy, while Russia needs to use less
- Despite steps in the right direction, the door to 2°C is closing

© OECD/IEA 2011