

World Energy Outlook 2013

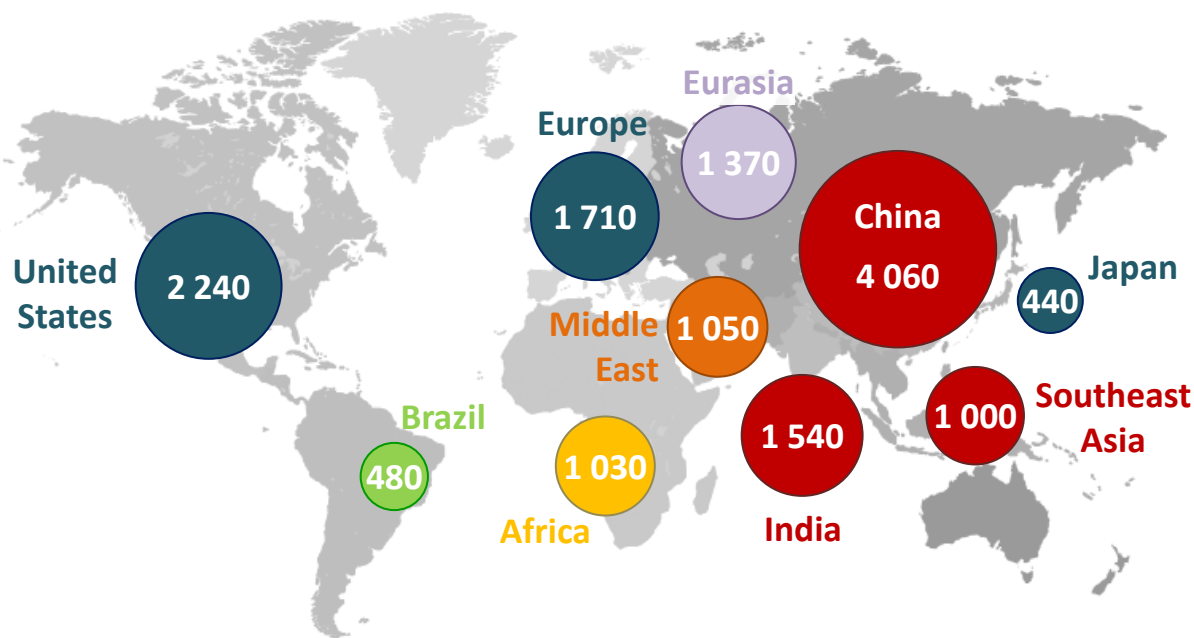
Dr. Timur Gül
Directorate of Global Energy Economics, IEA

Paris, 11 March 2014

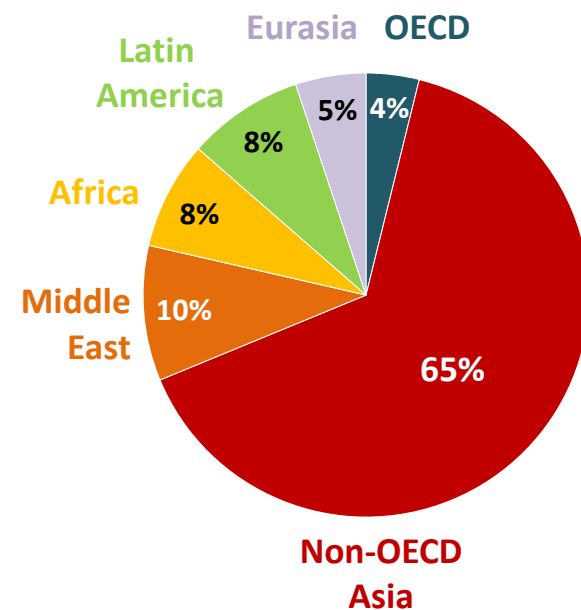
- **Some long-held tenets of the energy sector are being rewritten**
 - *Countries are switching roles: importers are becoming exporters...*
 - *... and exporters are among the major sources of growing demand*
 - *New supply options reshape ideas about distribution of resources*
- **But long-term solutions to global challenges remain scarce**
 - *Renewed focus on energy efficiency, but CO₂ emissions continue to rise*
 - *Fossil-fuel subsidies increased to \$544 billion in 2012*
 - *1.3 billion people lack electricity, 2.6 billion lack clean cooking facilities*
- **Energy prices add to the pressure on policymakers**
 - *Sustained period of high oil prices without parallel in market history*
 - *Large, persistent regional price differences for gas & electricity*

The engine of energy demand growth moves to South Asia

Primary energy demand, 2035 (Mtoe)



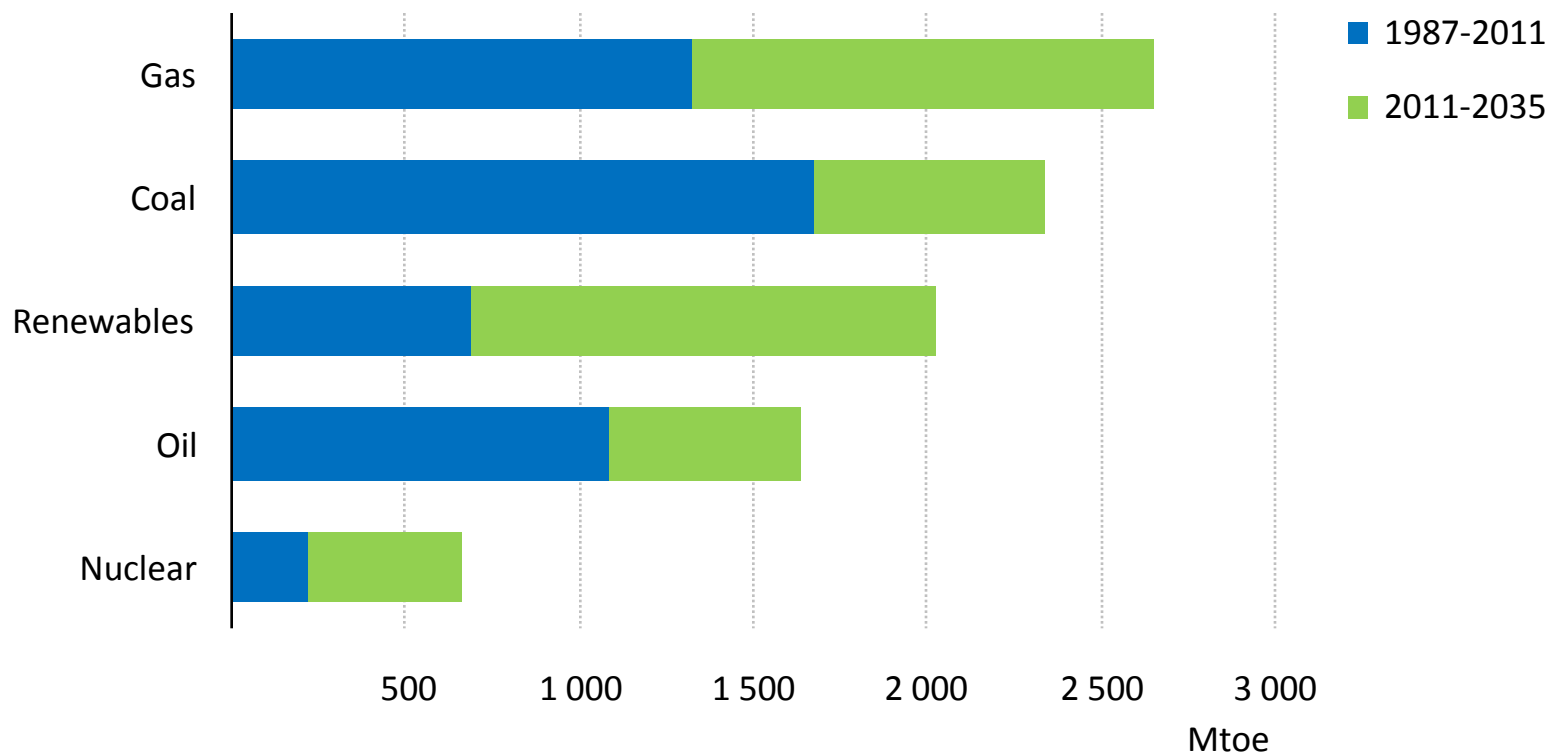
Share of global growth 2012-2035



China is the main driver of increasing energy demand in the current decade, but India takes over in the 2020s as the principal source of growth

A mix that is slow to change

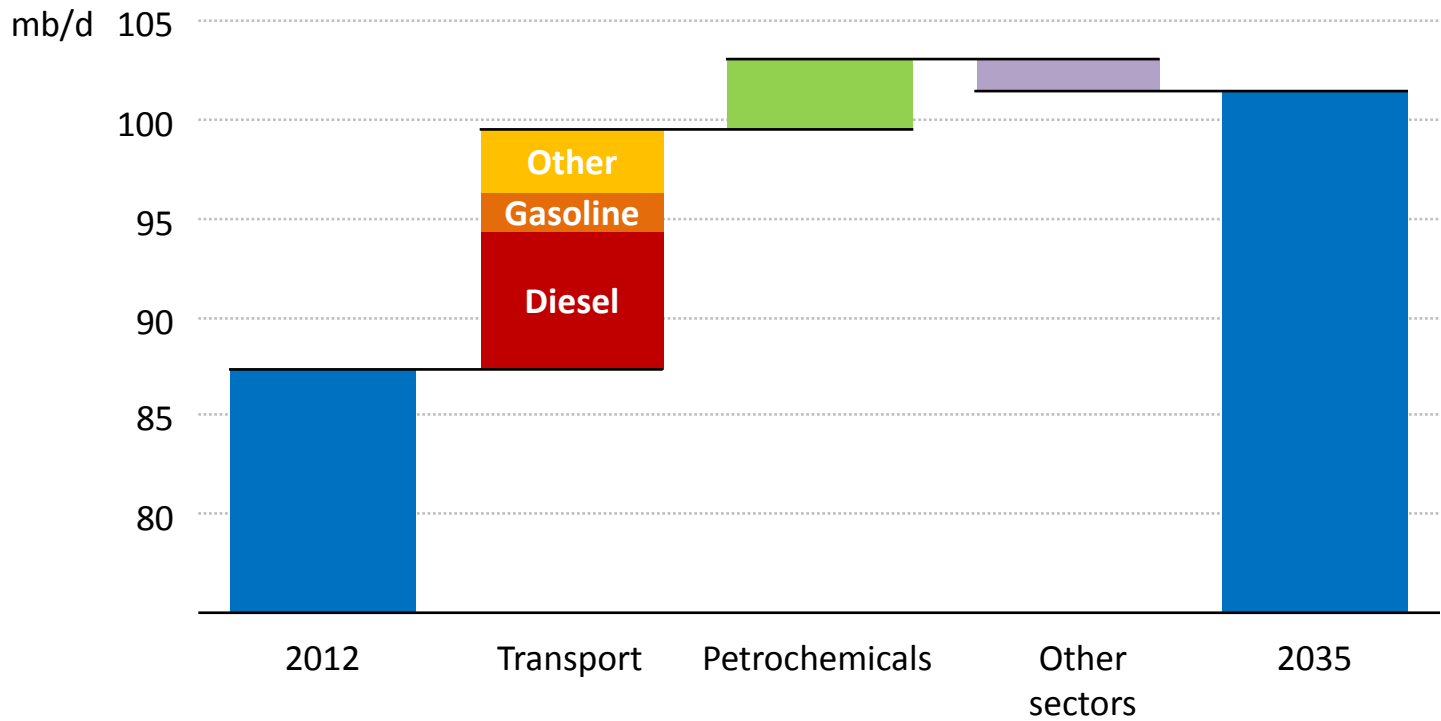
Growth in total primary energy demand



Today's share of fossil fuels in the global mix, at 82%, is the same as it was 25 years ago; the strong rise of renewables only reduces this to around 75% in 2035

Oil use grows, but in a narrowing set of markets

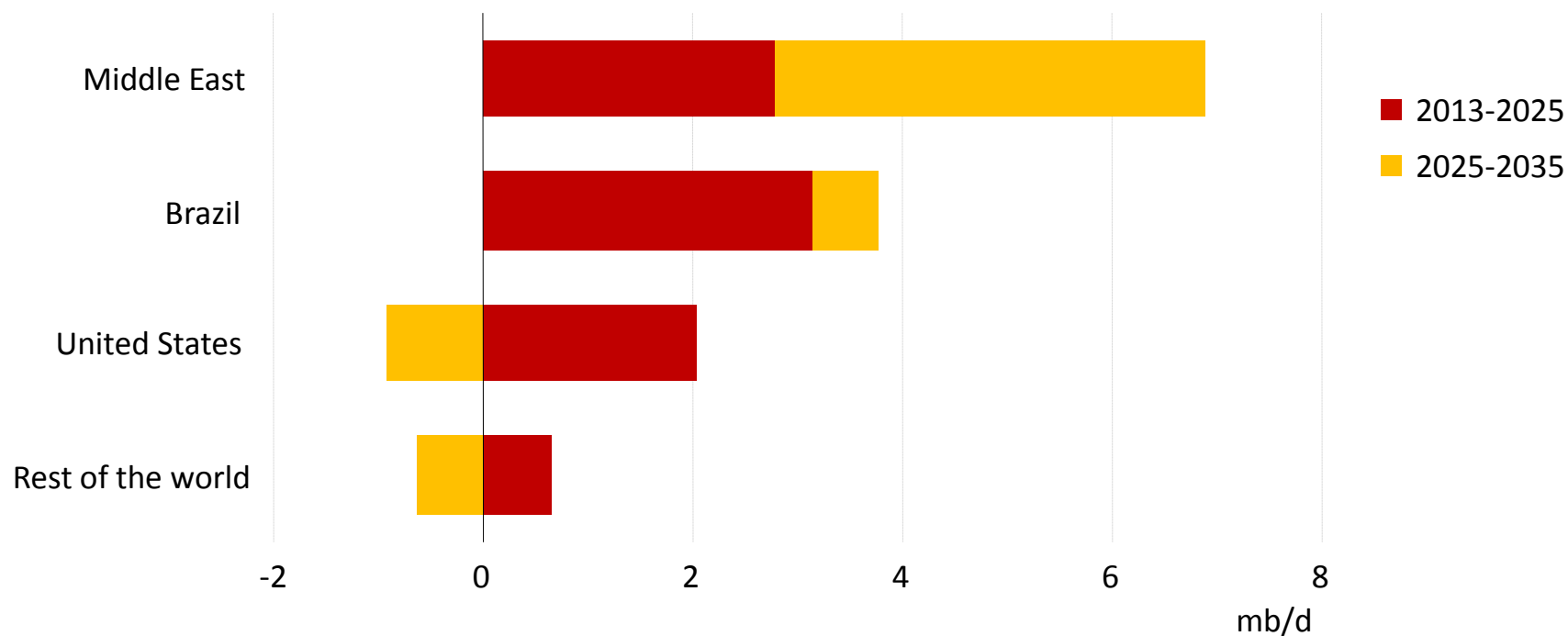
Oil demand by sector



China becomes the largest consumer of oil by 2030, as OECD oil use drops; demand is concentrated in transport, where diesel use surges by 5.5 mb/d, & petrochemicals

Two chapters to the oil production story

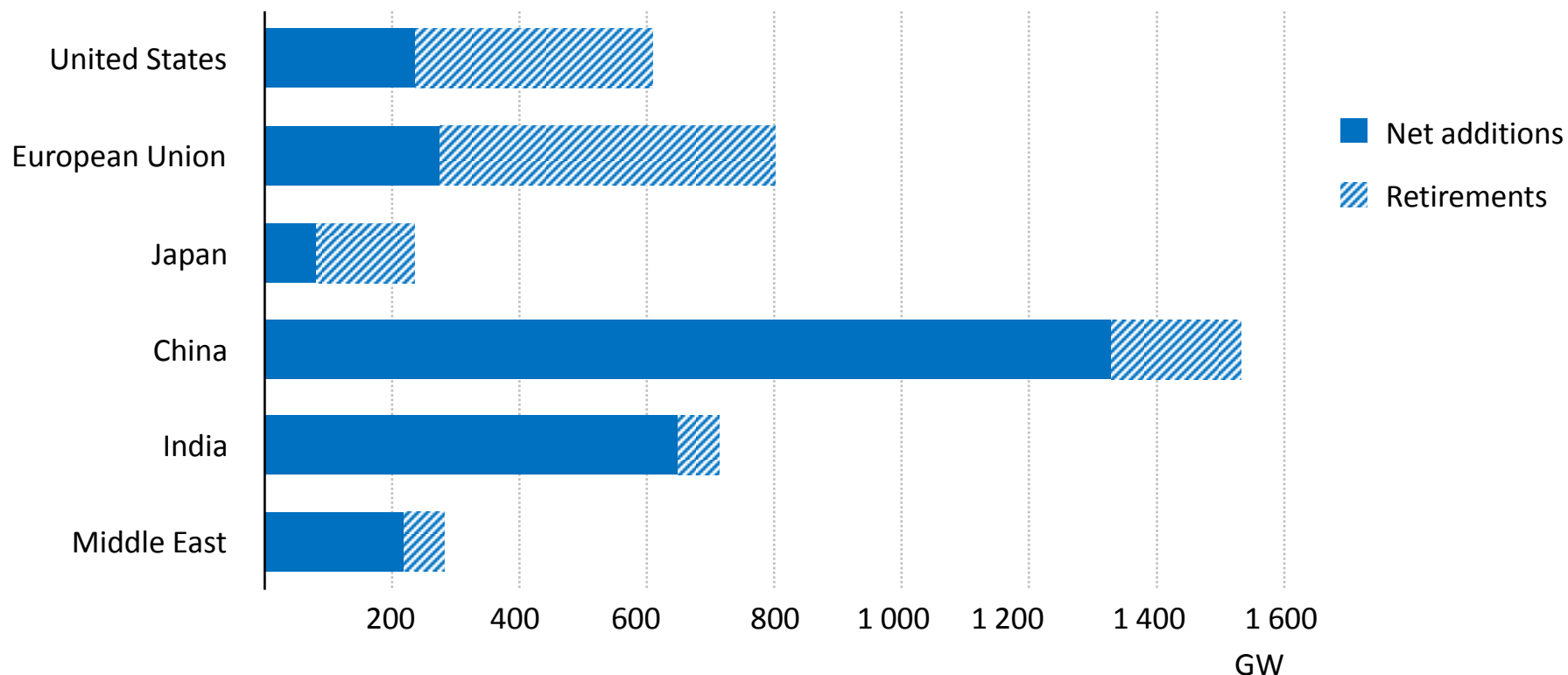
Contributions to global oil production growth



The United States (light tight oil) & Brazil (deepwater) step up until the mid-2020s, but the Middle East is critical to the longer-term oil outlook

Capacity to change?

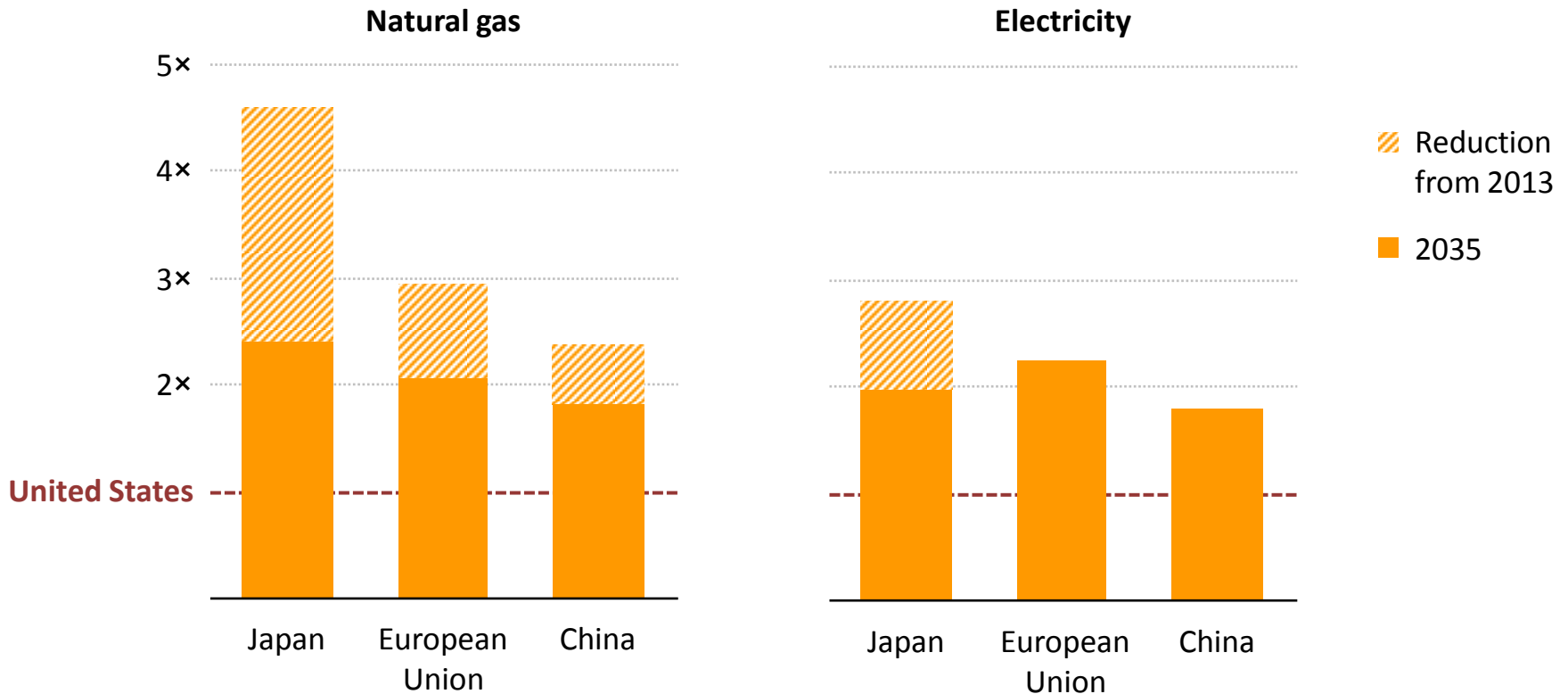
Power generation capacity additions and retirements, 2013-2035



***China & India together build almost 40% of the world's new capacity;
60% of capacity additions in the OECD replace retired plants***

Who has the energy to compete?

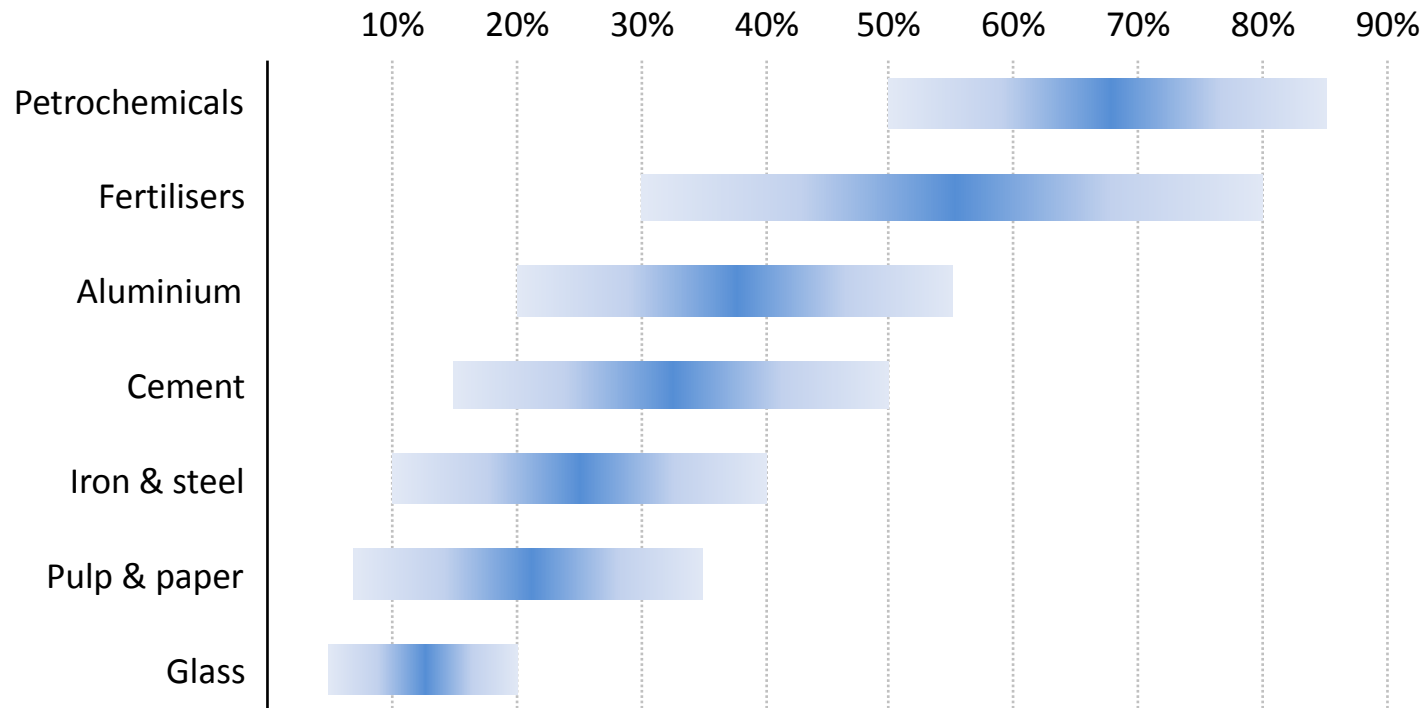
Ratio of industrial energy prices relative to the United States



Regional differences in natural gas prices narrow from today's very high levels but remain large through to 2035; electricity price differentials also persist

Energy-intensive industries need to count their costs

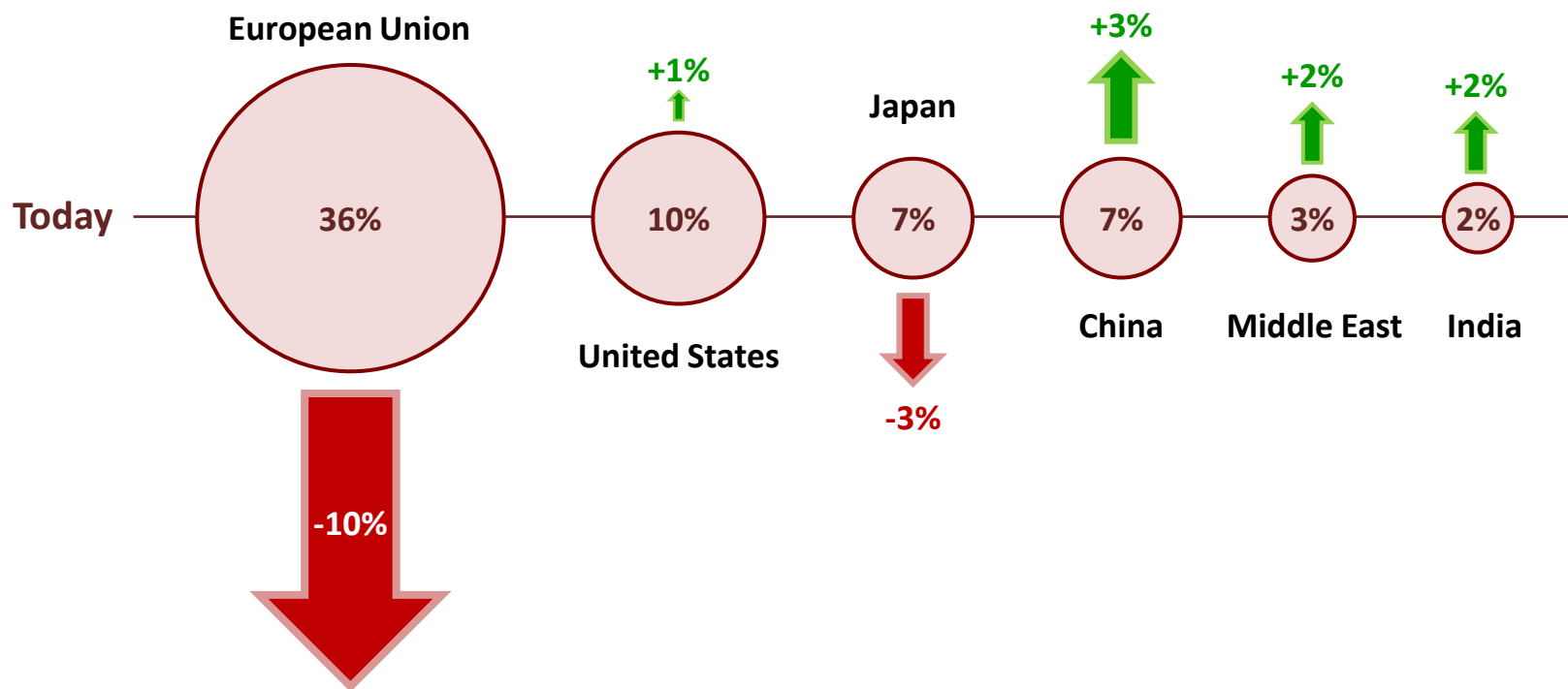
Share of energy in total production costs for selected industries



Energy-intensive sectors worldwide account for around one-fifth of industrial value added, one-quarter of industrial employment and 70% of industrial energy use.

An energy boost to the economy?

Share of global export market for energy-intensive goods

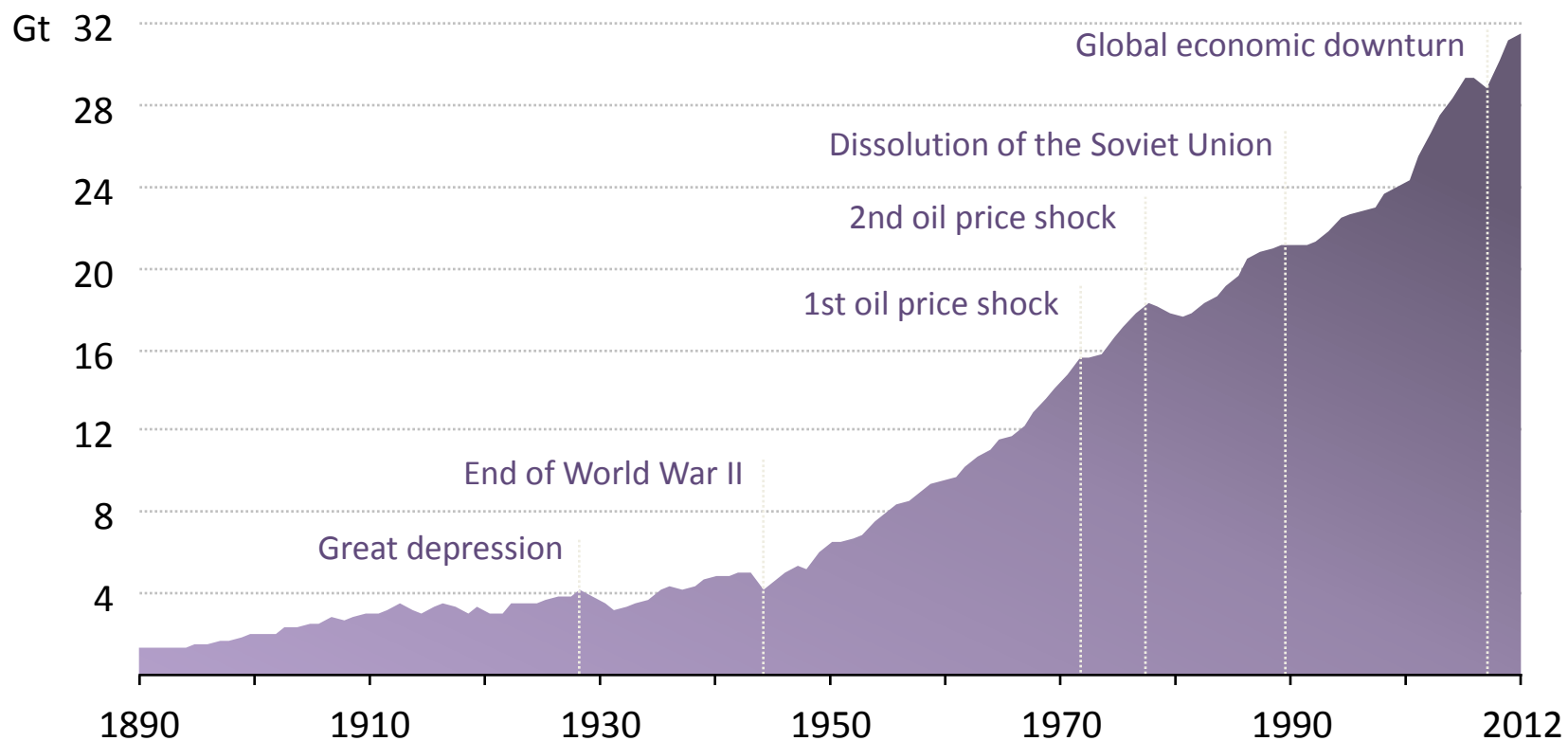


The US, together with key emerging economies, increases its export market share for energy-intensive goods, while the EU and Japan see a sharp decline

Emissions off track in the run-up to the 2015 climate summit in France

WORLD
ENERGY
OUTLOOK
2013

Global energy-related CO₂ emissions



In the New Policies Scenario, CO₂ emissions trends point to a long-term temperature increase of 3.6 °C

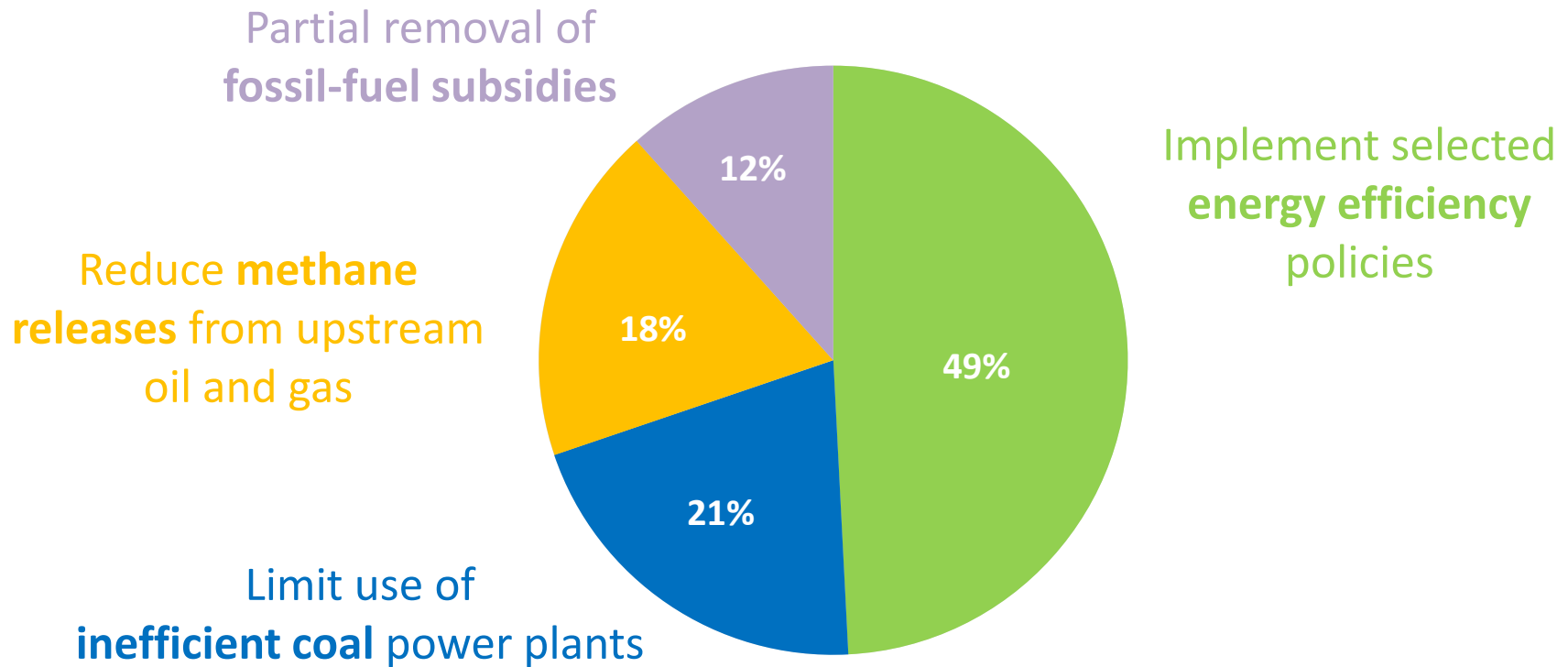
Source: Redrawing the energy-climate map; WEO Special Report 2013

Four measures to keep the 2 °C target alive

- **National efforts in this decade need to buy time for an international agreement, expected to come into force in 2020**
- **Measures to 2020 should meet key criteria:**
 - *No harm to countries' economic growth*
 - *Significant near-term emissions reductions*
 - *Reliance only on existing technologies and proven policies*
 - *Significant national benefits other than climate change mitigation*
- **Our 4-for-2 °C Scenario proposes four measures that meet these criteria**

Four measures can stop emissions growth by 2020

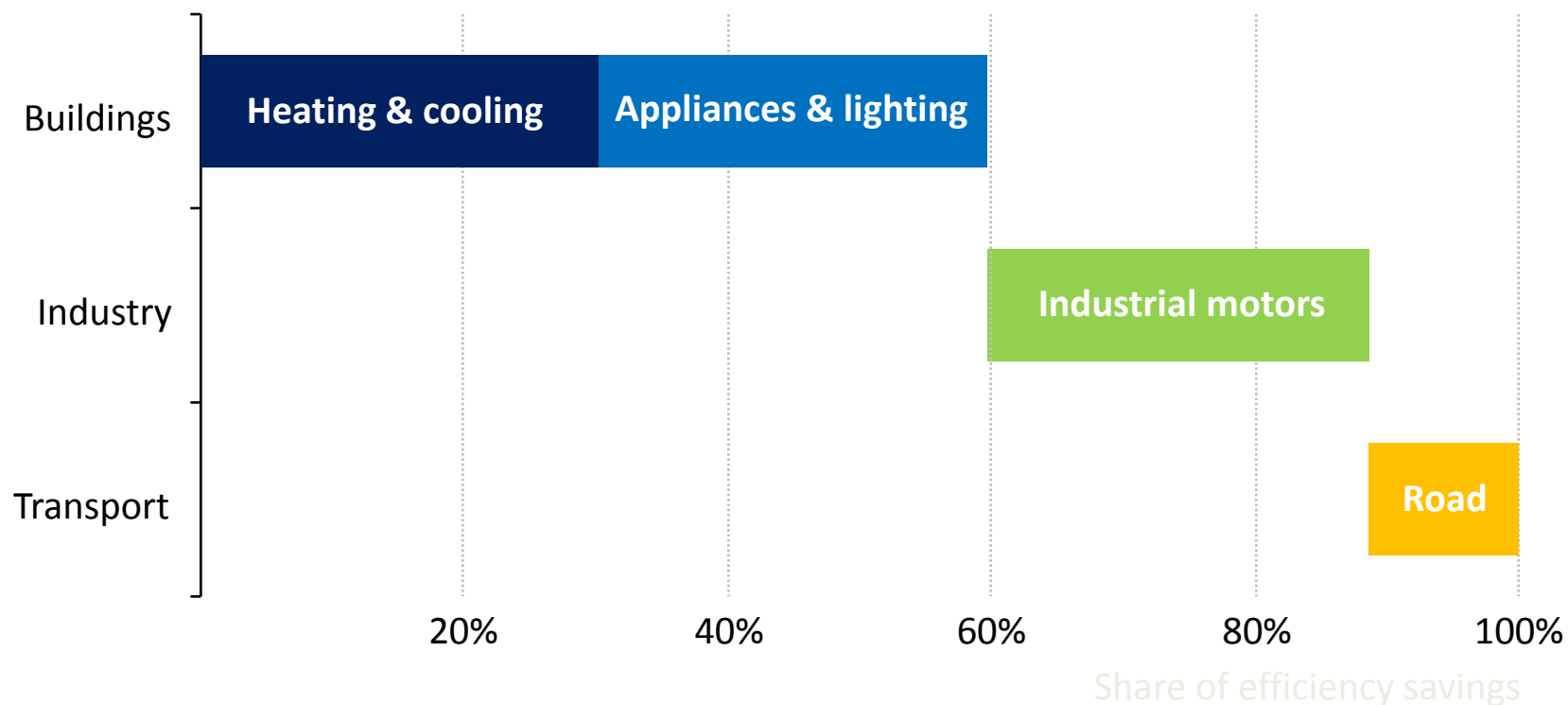
Emissions savings in the 4-for-2 °C Scenario, 2020



Four measures can stop the growth in emissions by 2020 at no net economic cost, reducing emissions by 3.1 Gt, 80% of the savings required for a 2 °C path

Measure 1: Improve energy efficiency

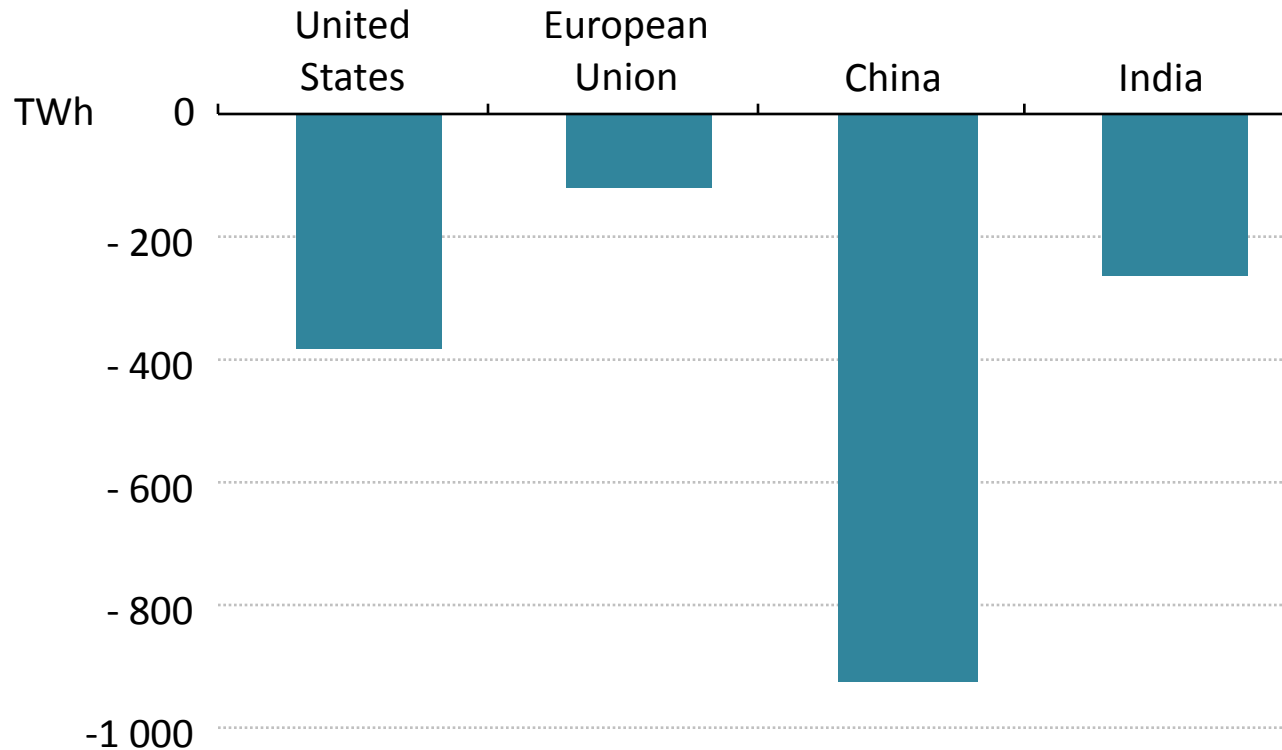
Emissions savings in the 4-for-2 °C Scenario, 2020



Energy efficiency reduces emissions by 1.5 Gt, led by minimum energy performance standards – additional investment is more than offset by fuel bill savings

Measure 2: Limit the use of inefficient coal power plants

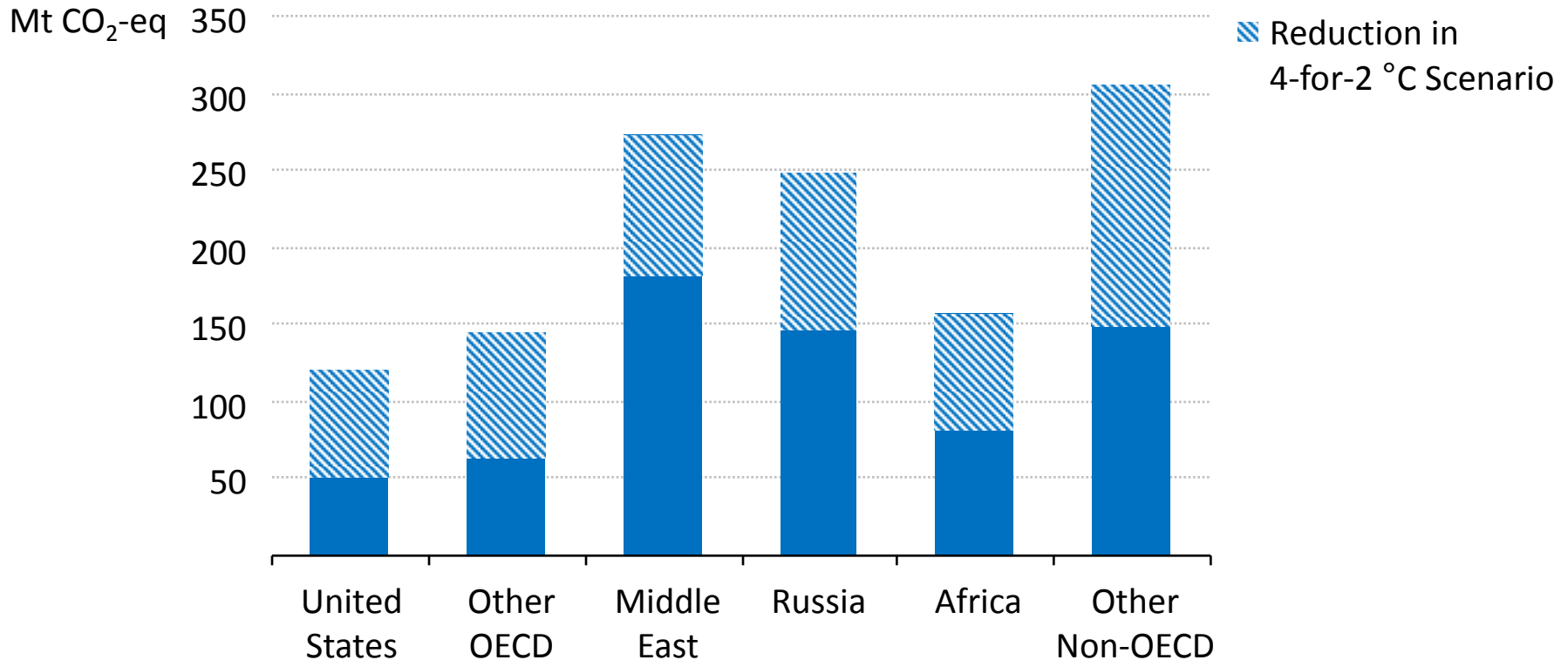
Reduction in coal-fired electricity generation from the least-efficient plants, 2020



Energy efficiency and reducing the use of the least-efficient coal power plants have co-benefits for local air pollution

Measure 3: Reduce methane releases into the atmosphere

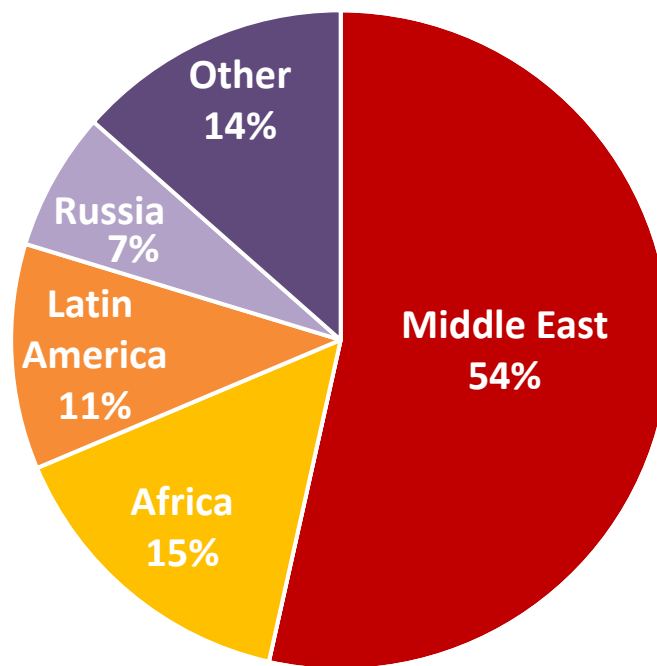
Methane emissions from the upstream oil and gas industry, 2020



In 2010, global methane releases were 1.1 Gt CO₂-eq; halving the level in 2020 adds around 0.5% to cumulative upstream investment

Measure 4: Partial removal of fossil-fuel subsidies

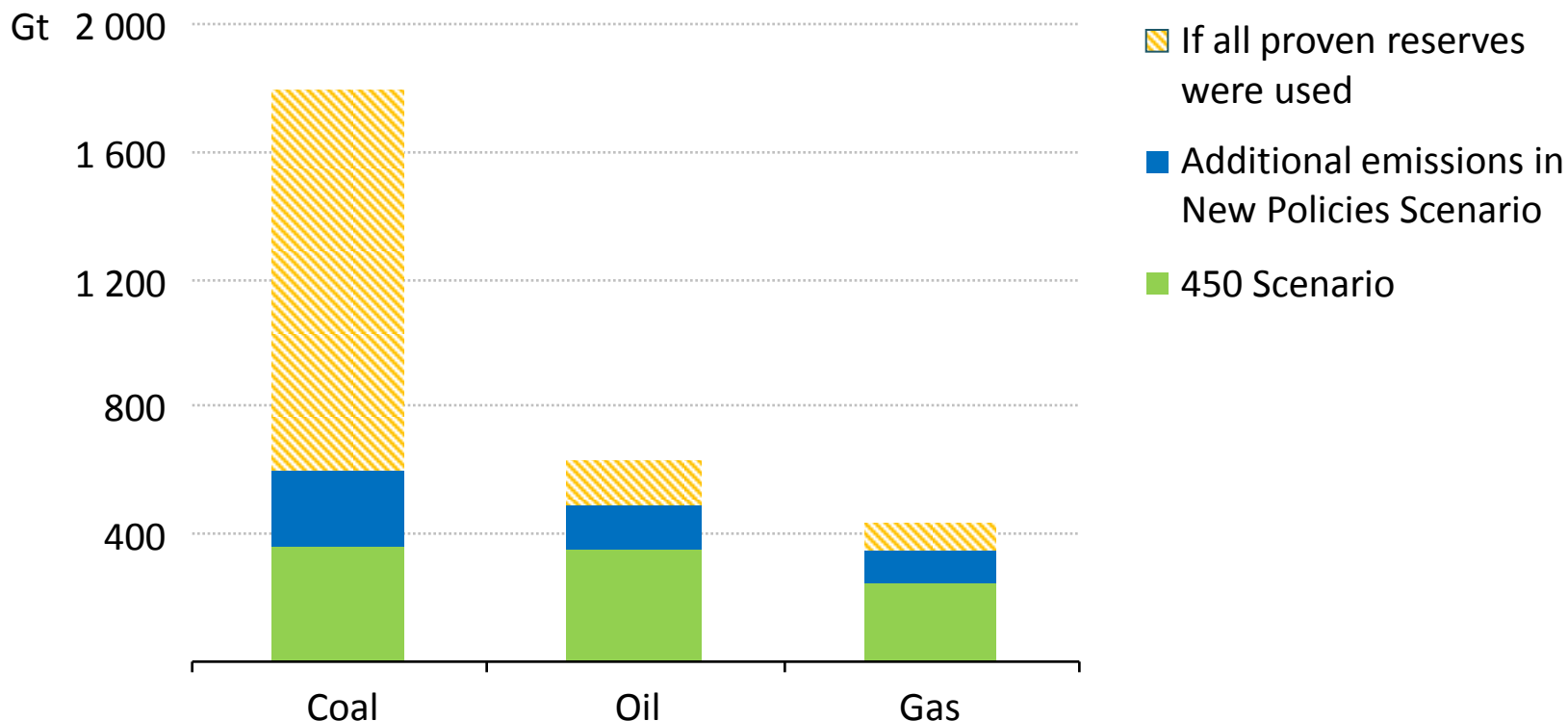
Savings in the 4-for-2 °C Scenario: 360 Mt



Fossil-fuel subsidies in 2011 were equivalent to an incentive of \$110 per tonne of CO₂

Some fossil-fuel reserves may remain underground

Potential CO₂ emissions from proven fossil-fuel reserves to 2050



On today's trends, half of the proven fossil-fuel reserves would be left undeveloped to 2050 – stronger climate action would increase the share

- **Abundance & low prices in some regions, scarcity & high prices in others – what do fossil fuel trends imply for climate goals?**
 - *Reconciling economic, climate and energy security goals is a key challenge for energy policy*

- **Four measures can keep the door to 2 °C open in the short-term, but more low-carbon technologies are required for the transition**
 - *What are the investment needs for mitigating climate change?*
 - *Can we attract enough capital to facilitate the energy transition?*
 - *What financing vehicles do we have?*
 - *What role for policy, what role for markets?*
 - *What are the economic-wide implications of an energy transition?*