

WORLD ENERGY OUTLOOK 2012

World Energy Outlook 2012

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■ Foundations of global energy system shifting

- *Resurgence in oil & gas production in some countries*
- *Retreat from nuclear in some others*
- *Signs of increasing policy focus on energy efficiency*

■ All-time high oil prices acting as brake on global economy

- *Divergence in natural gas prices affecting Europe (with prices 5-times US levels) and Asia (8-times)*

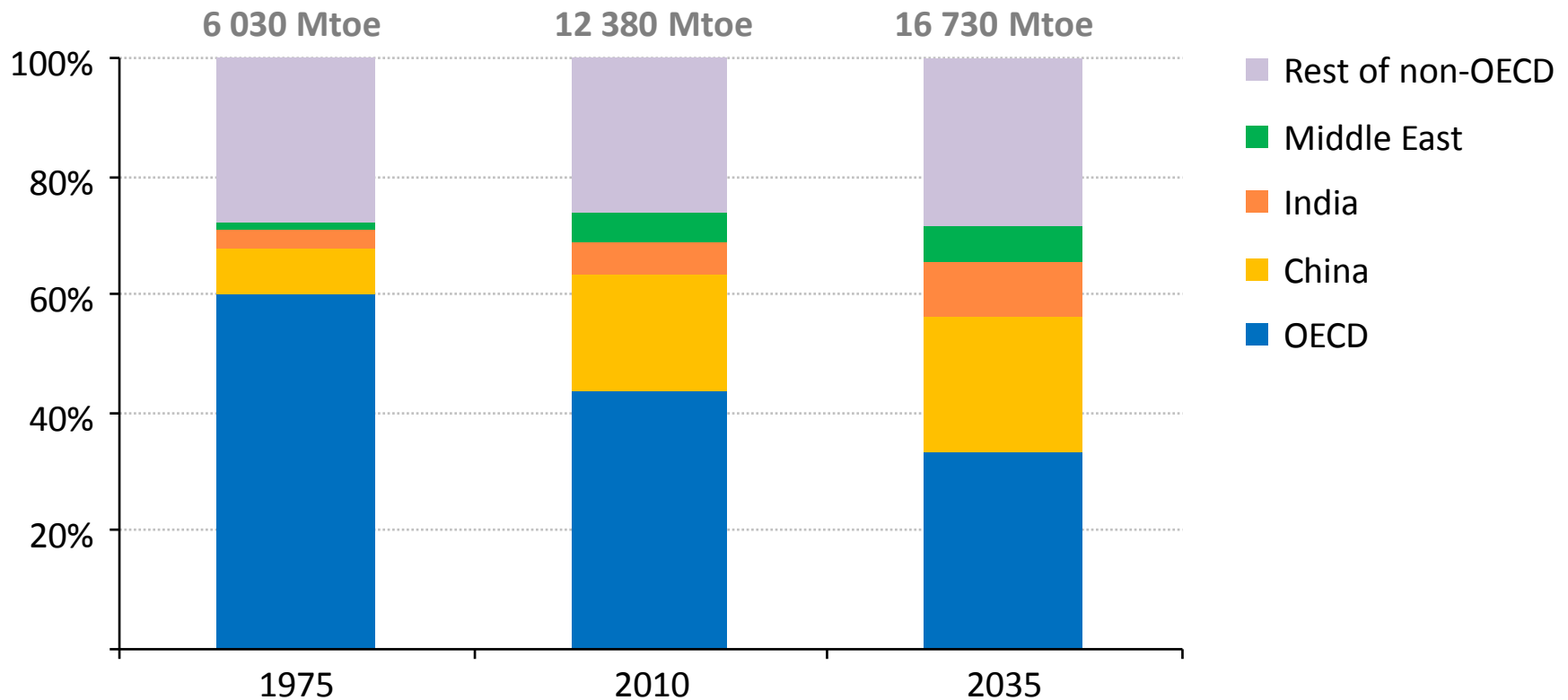
■ Symptoms of an unsustainable energy system persist

- *Fossil fuel subsidies up almost 30% to \$523 billion in 2011, led by MENA*
- *CO₂ emissions at record high, while renewables industry under strain*
- *Despite new international efforts, 1.3 billion people still lack electricity*

Emerging economies steer energy markets

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Share of global energy demand

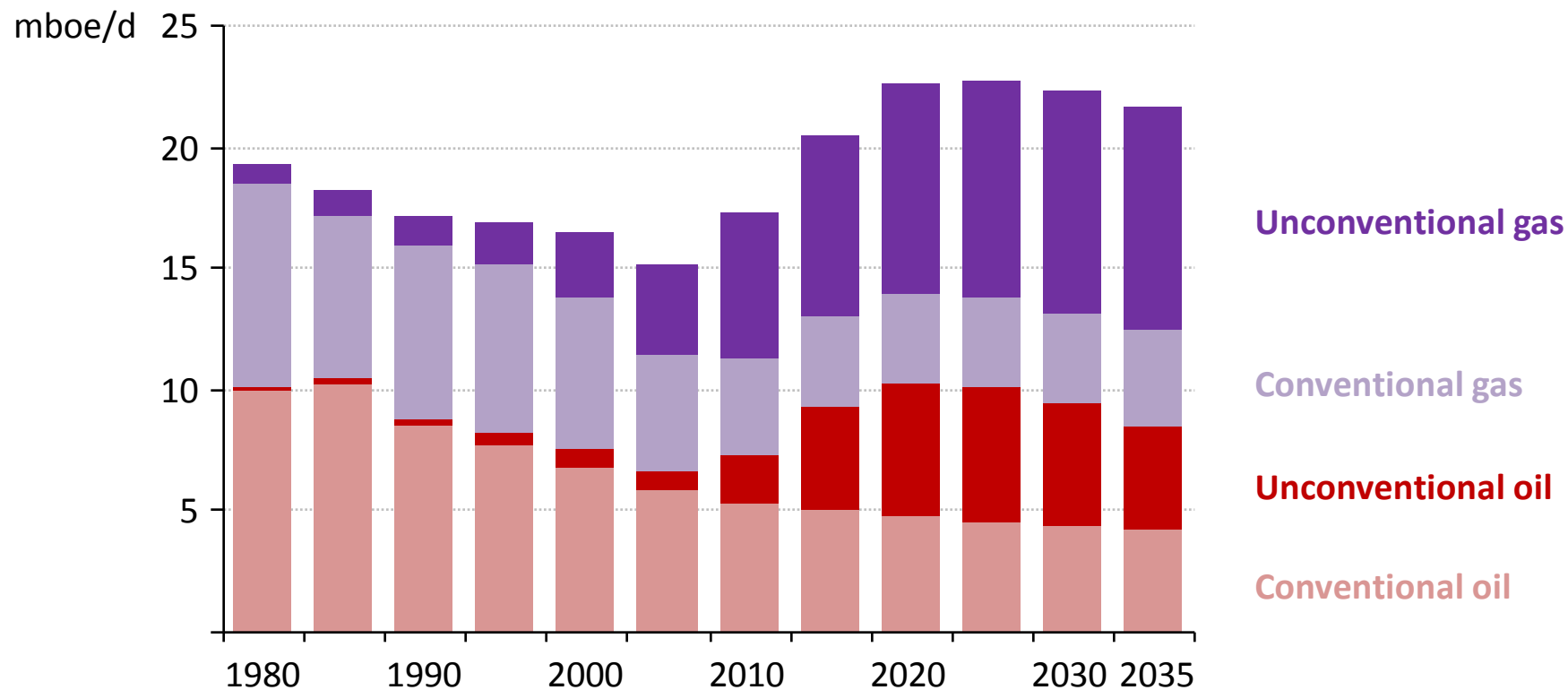


Global energy demand rises by over one-third in the period to 2035, underpinned by rising living standards in China, India & the Middle East

A United States oil & gas transformation

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US oil and gas production

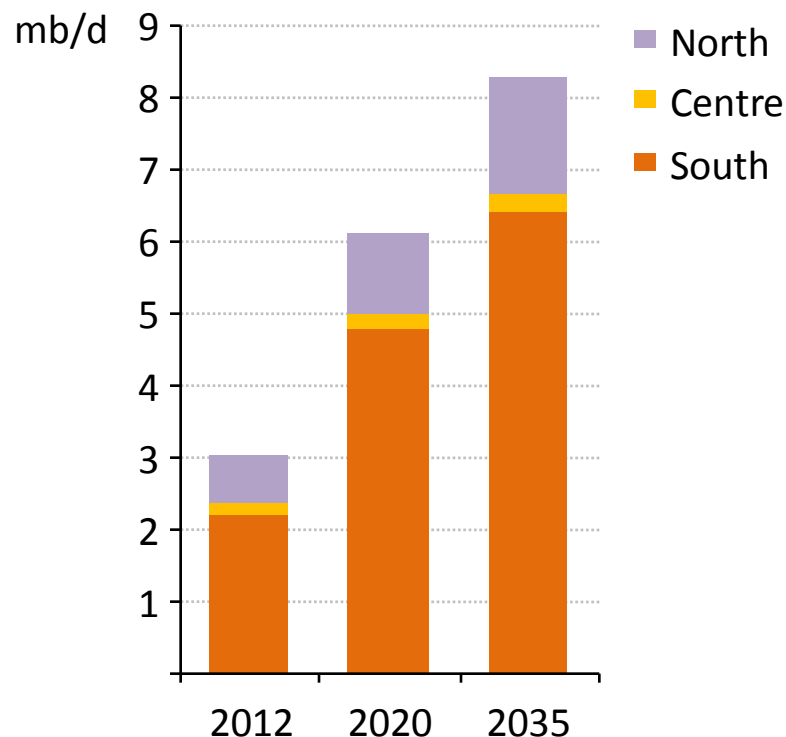


The surge in unconventional oil & gas production has implications well beyond the United States

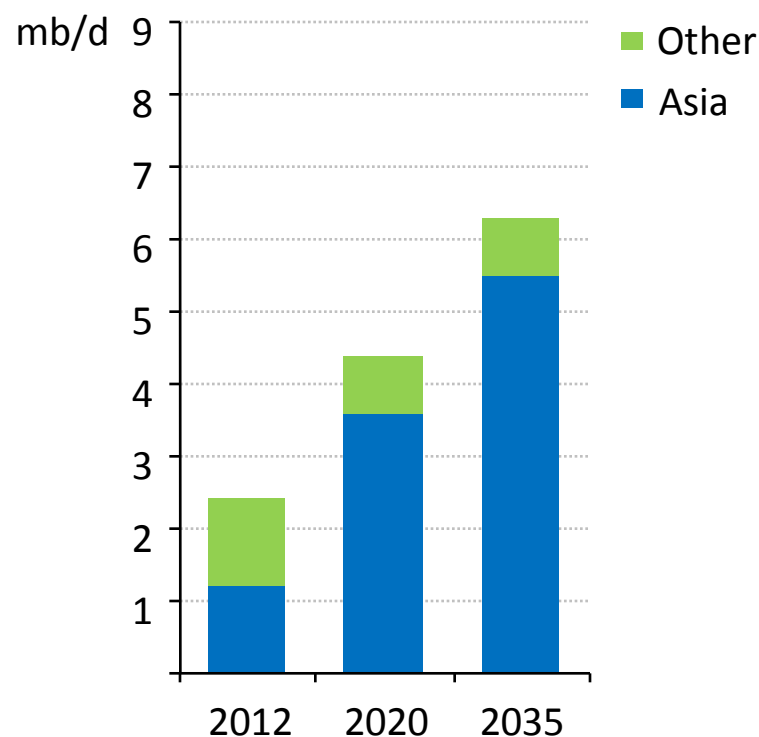
Iraq oil poised for a major expansion

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Iraq oil production



Iraq oil exports

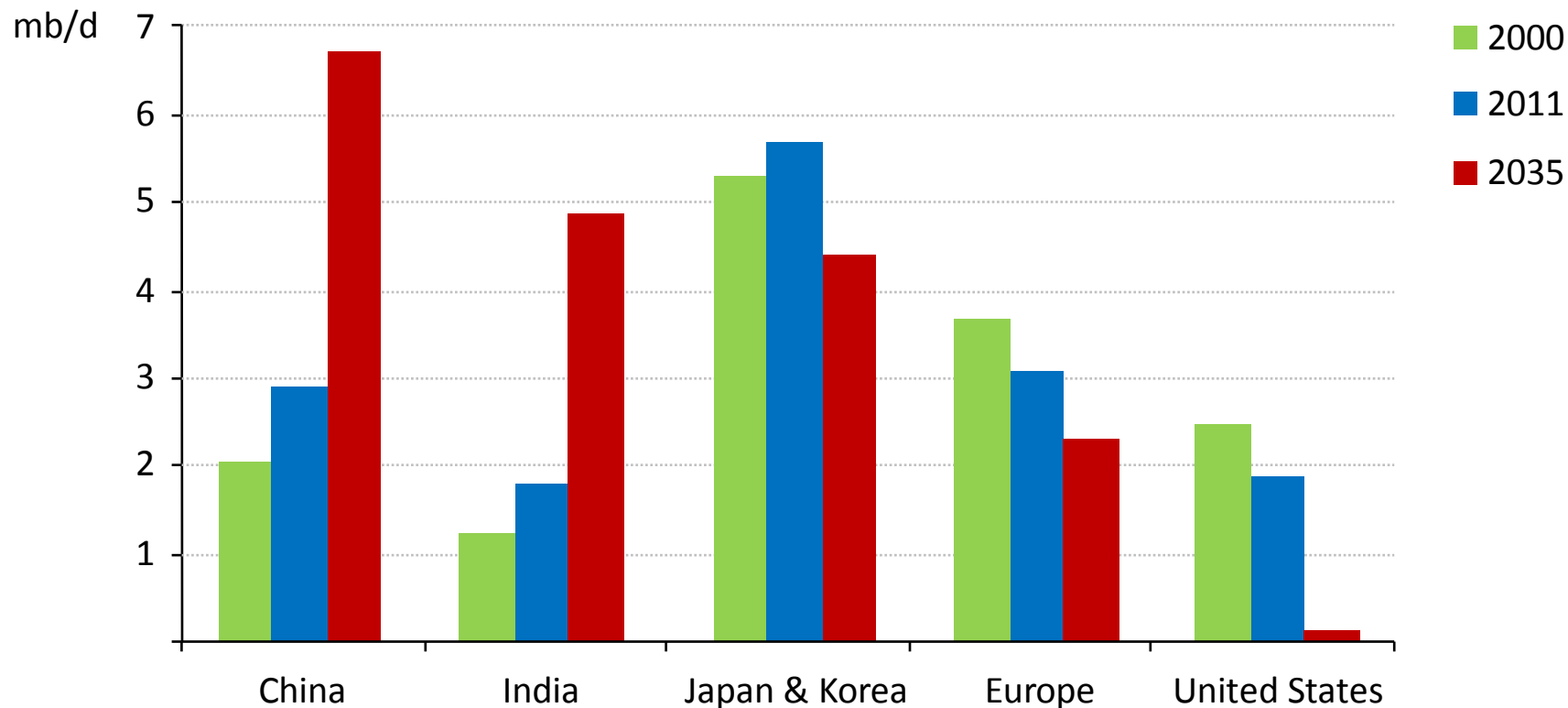


***Iraq accounts for 45% of the growth in global production to 2035;
by the 2030s it becomes the second-largest global oil exporter, overtaking Russia***

Middle East oil to Asia: a new silk road

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Middle East oil export, by destination

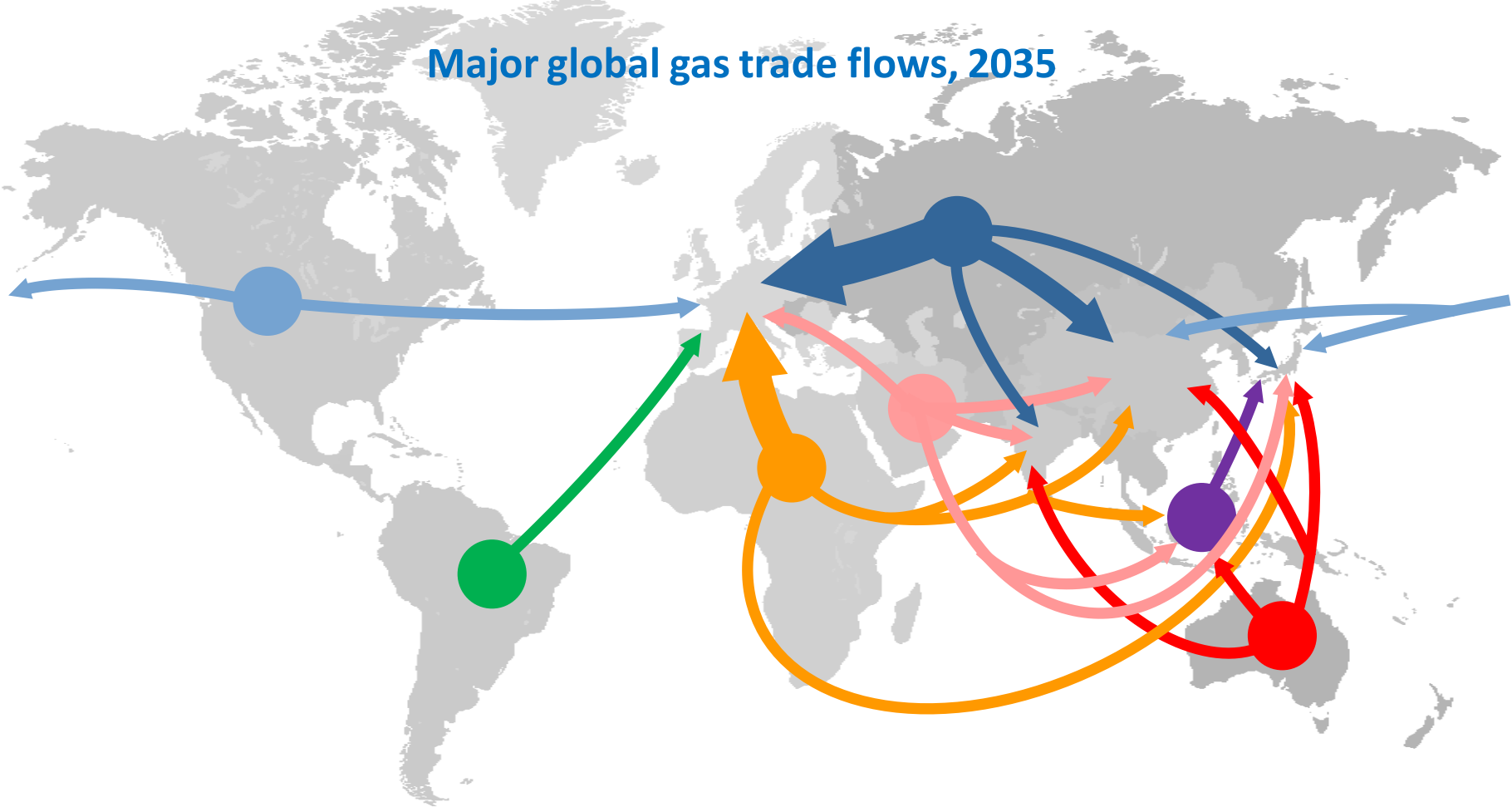


By 2035, almost 90% of Middle Eastern oil exports go to Asia; North America's emergence as a net exporter accelerates the eastward shift in trade

Natural gas: towards a globalised market

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Major global gas trade flows, 2035

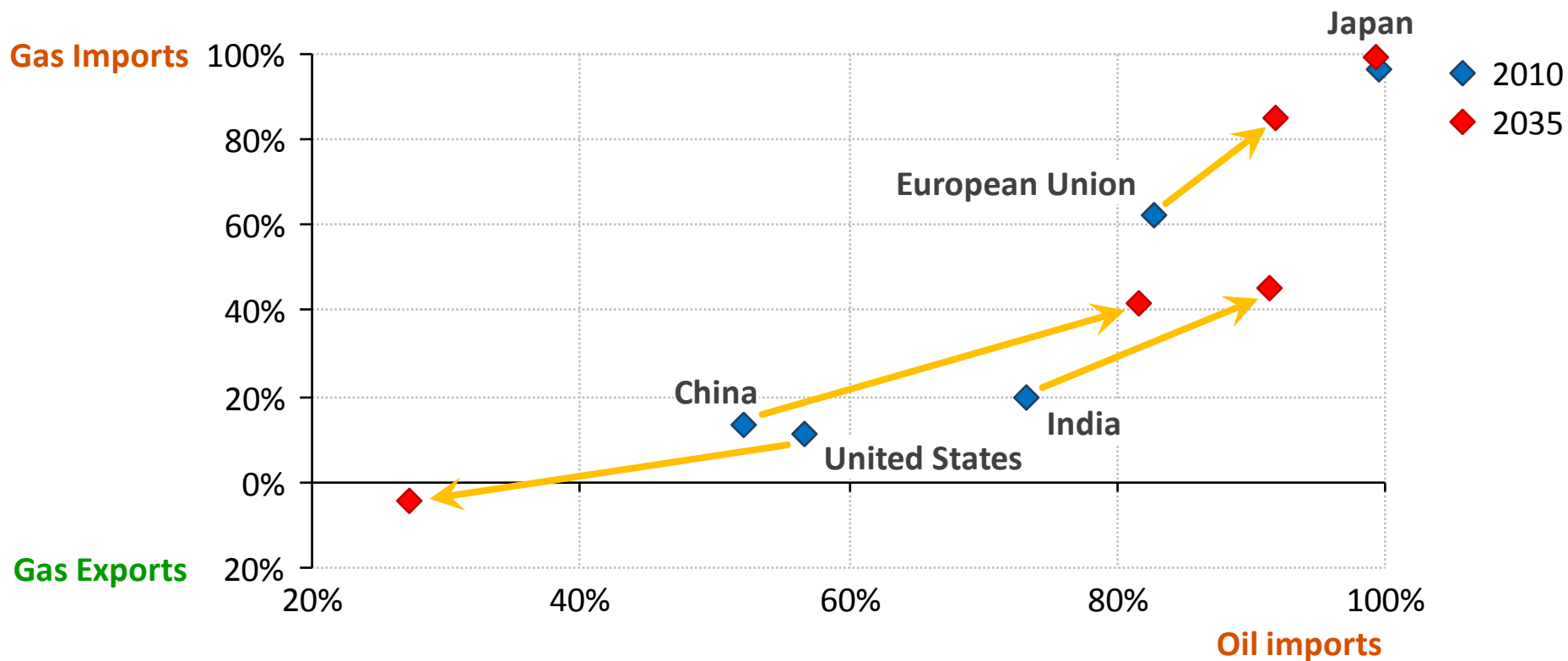


Rising supplies of unconventional gas & LNG help to diversify trade flows, putting pressure on conventional gas suppliers & oil-linked pricing mechanisms

Different trends in oil & gas import dependency

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Net oil & gas import dependency in selected countries

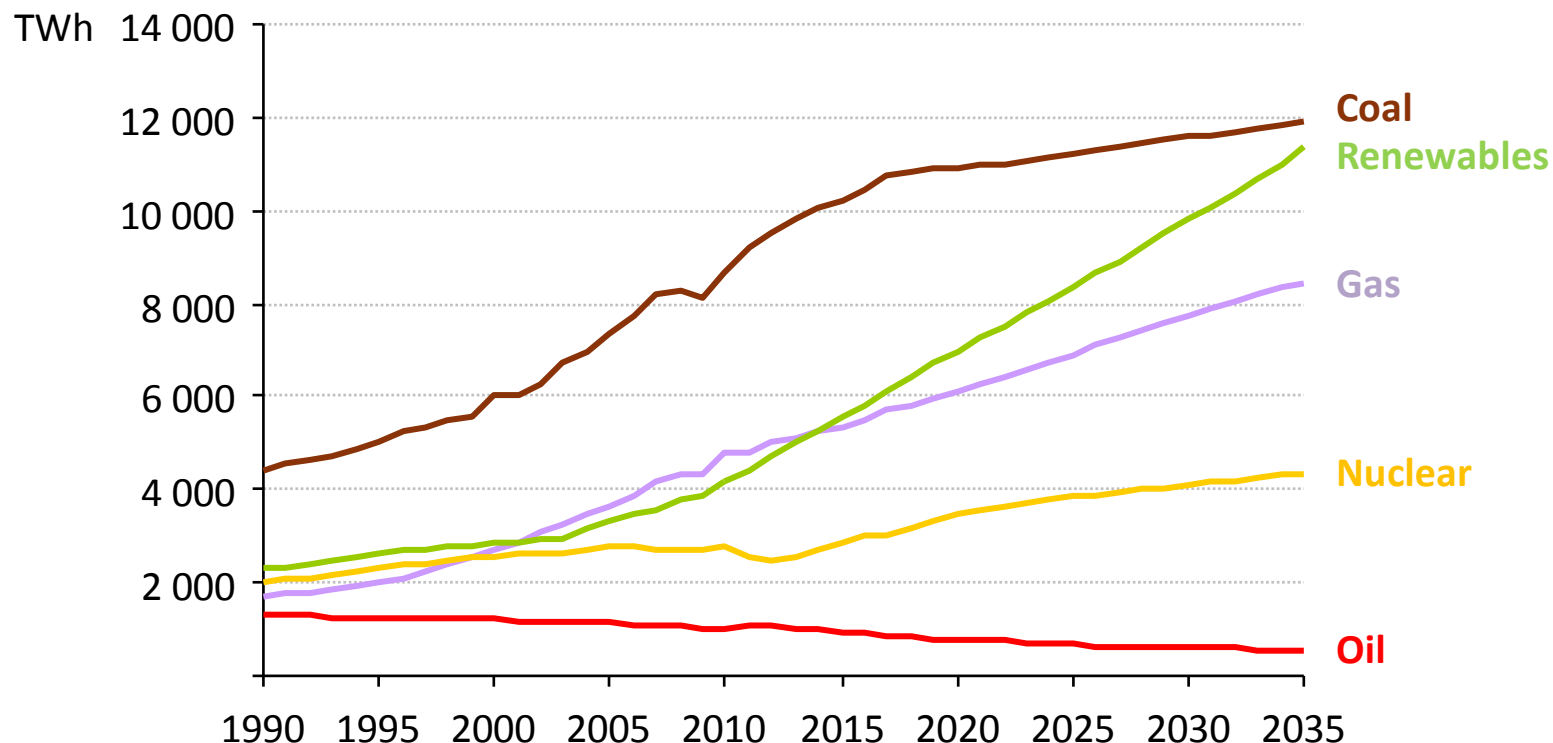


While dependence on imported oil & gas rises in many countries, the United States swims against the tide

The power generation mix is set to change

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Global electricity generation by source, 2010-2035

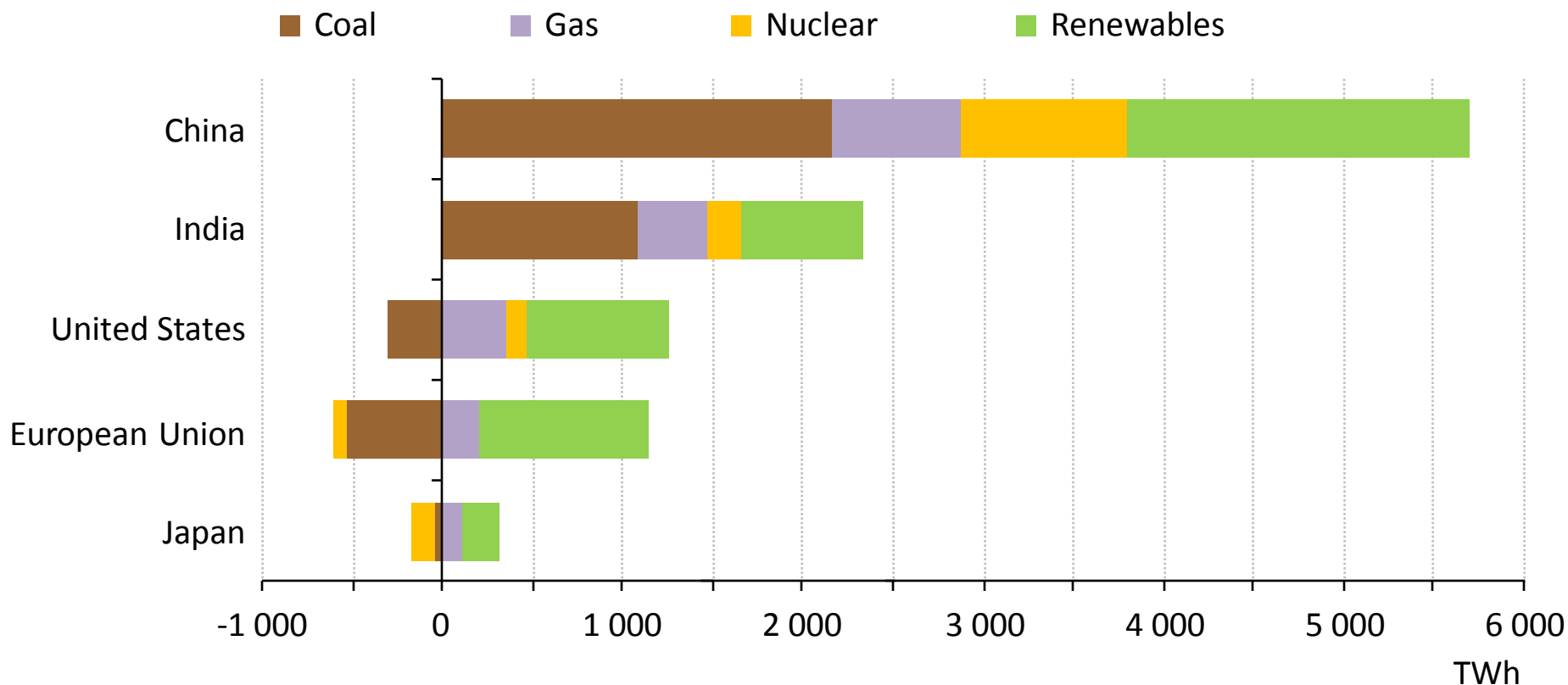


Renewables electricity generation overtakes natural gas by 2015 & almost coal by 2035; growth in coal generation in emerging economies outweighs a fall in the OECD

A power shift to emerging economies

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Change in power generation, 2010-2035

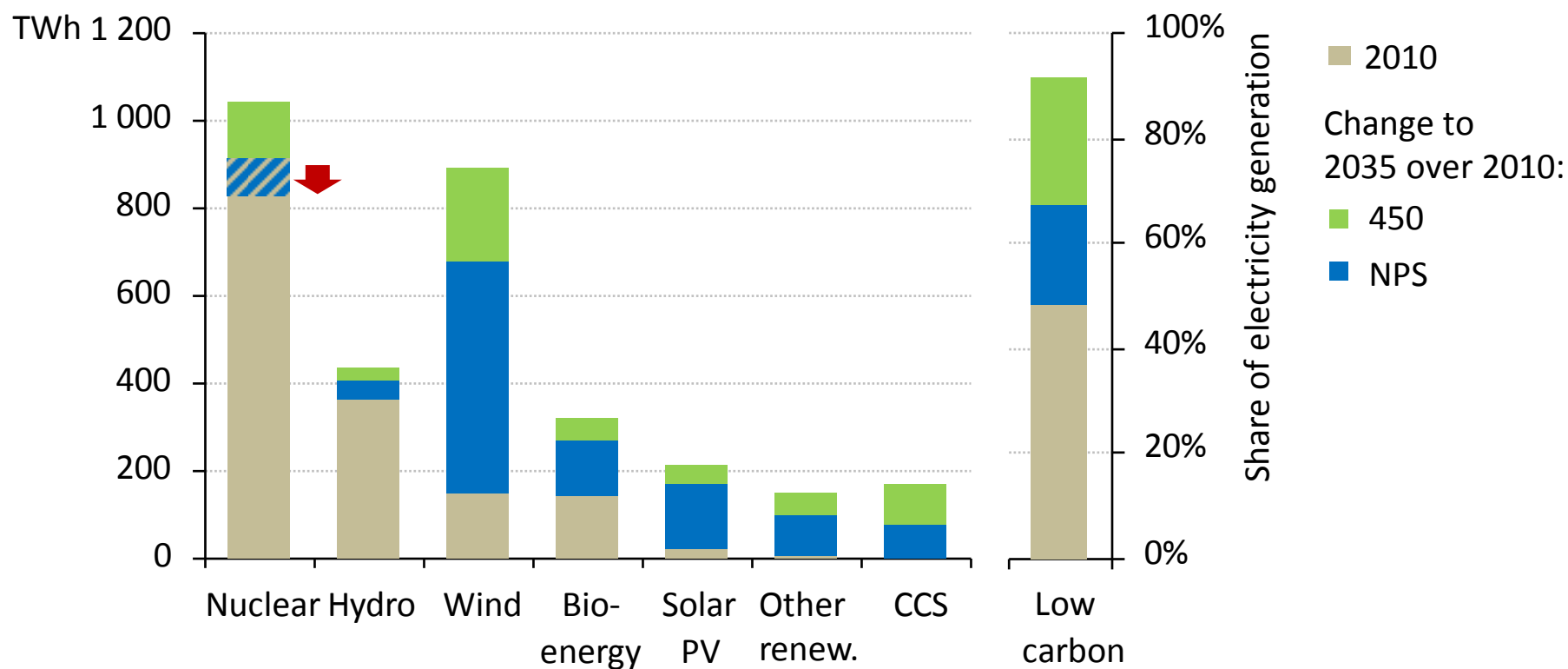


The need for electricity in emerging economies drives a 70% increase in worldwide demand, with China and India accounting for over half of the global growth

EU moving towards cleaner forms of electricity generation

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Electricity generation by selected low carbon technology and share of generation by scenario in the European Union, 2010 & 2035



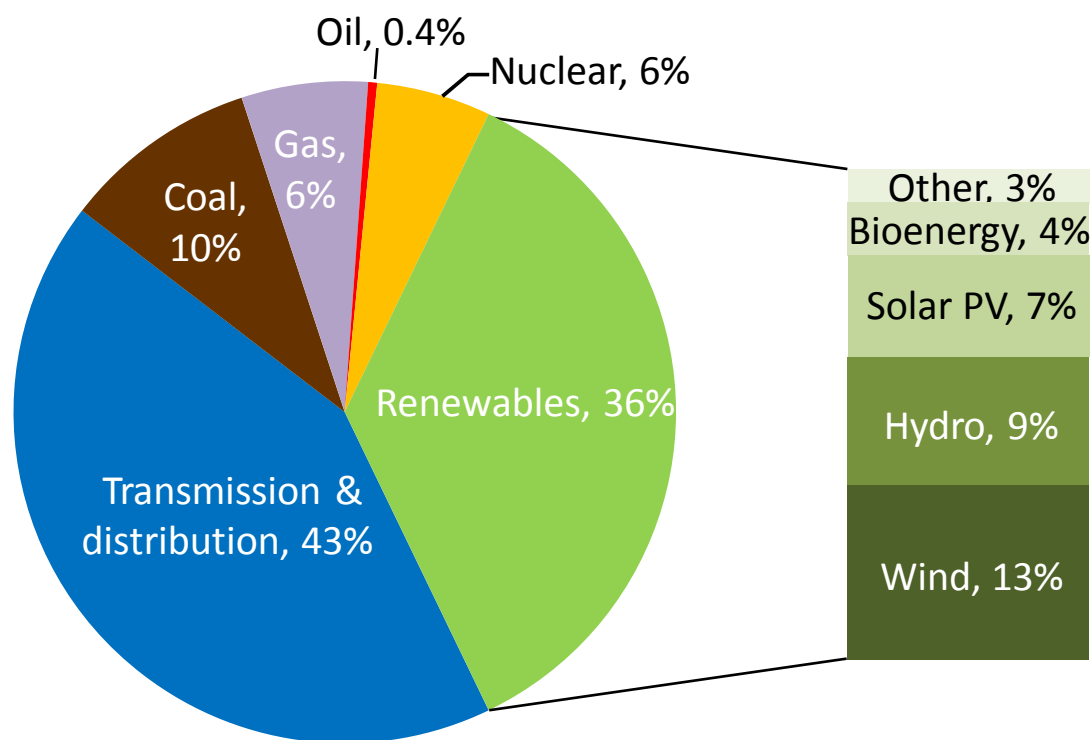
Wind & solar push up the share of renewables, with low-carbon reaching two-thirds of total generation in the NPS and around 90% in the 450 Scenario

The power sector becomes more capital intensive

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Investment by type in the New Policies Scenario, 2012-2035

Total investment: \$16.9 trillion

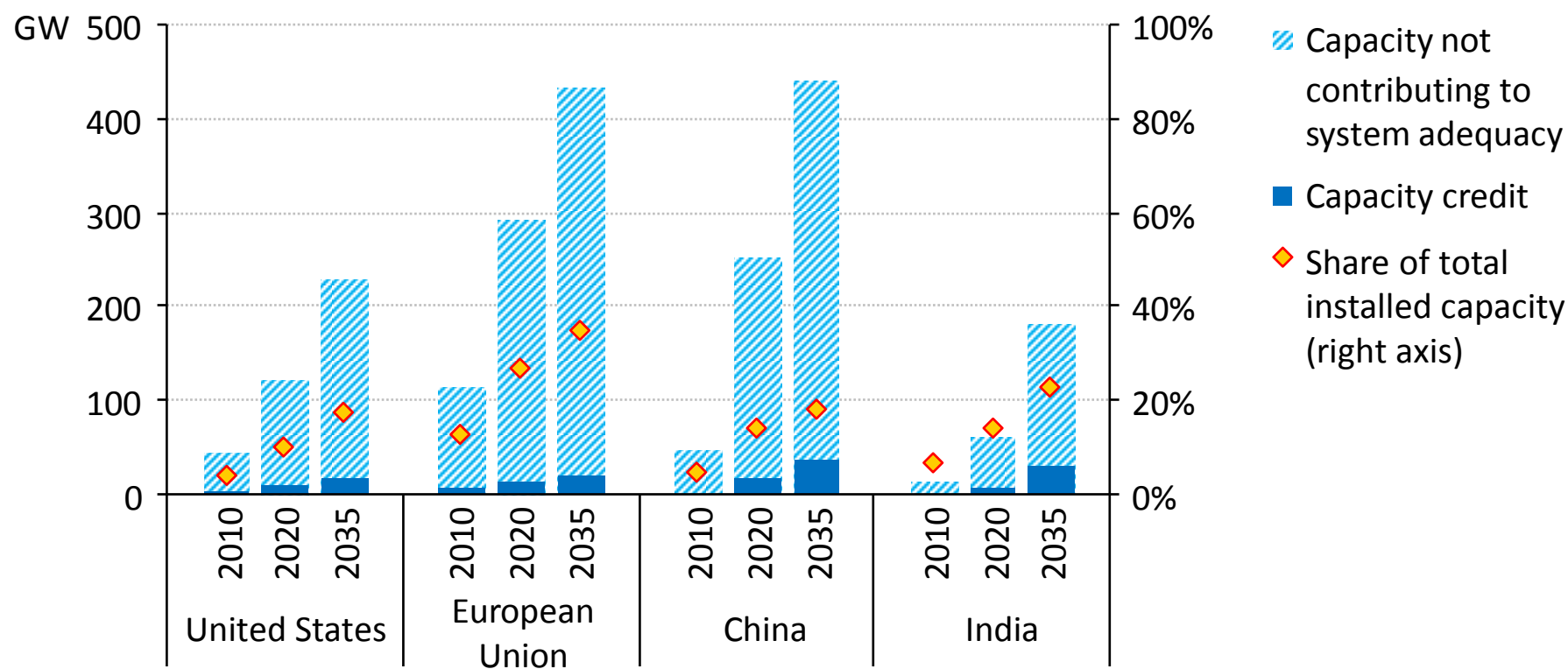


The power sector needs almost half of the global investment in energy infrastructure, with renewables accounting for over 60% of the investments in new power plants

Increasing shares of renewables pose new challenges

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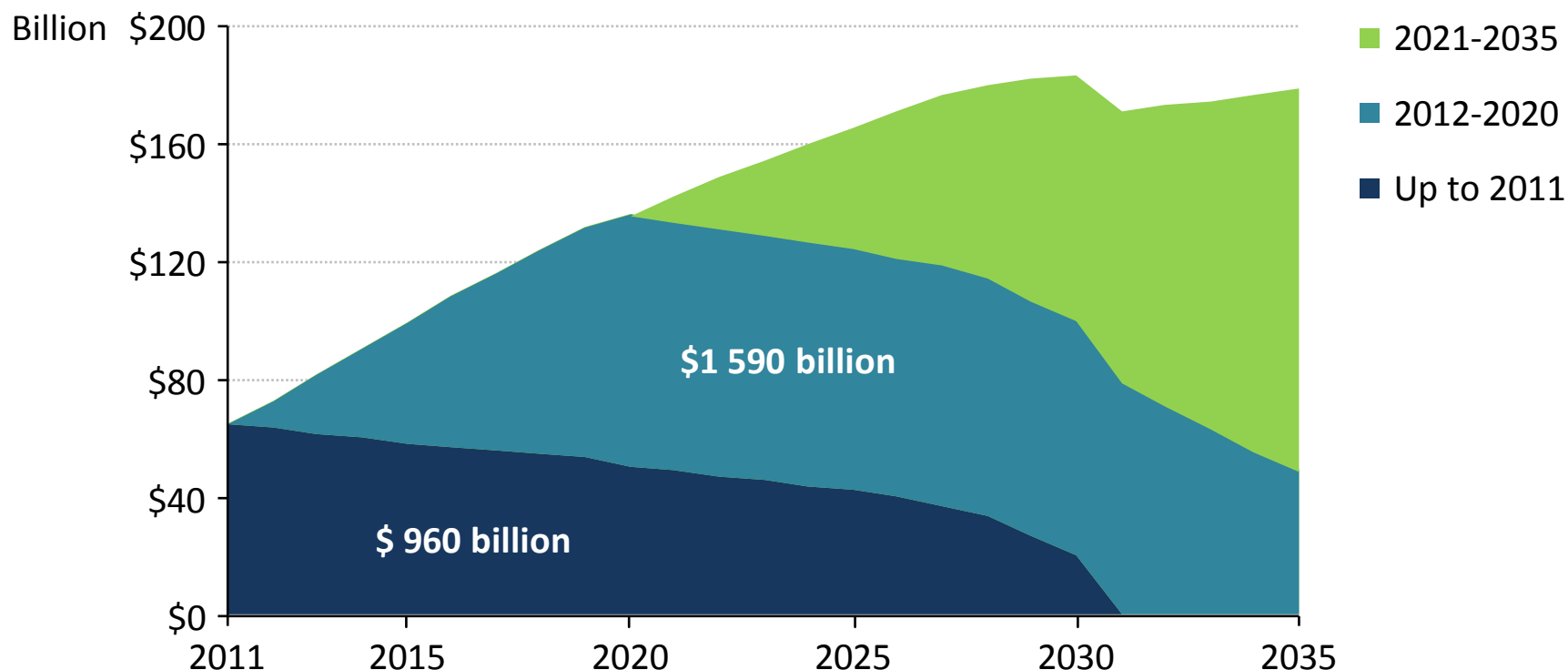
Installed wind & solar PV capacity and their contribution to system adequacy



Wind and solar are set to increase strongly, reaching almost one-fifth of global installed capacity in 2035, but their contribution to security of supply is limited

Increasing subsidies for increasing renewables

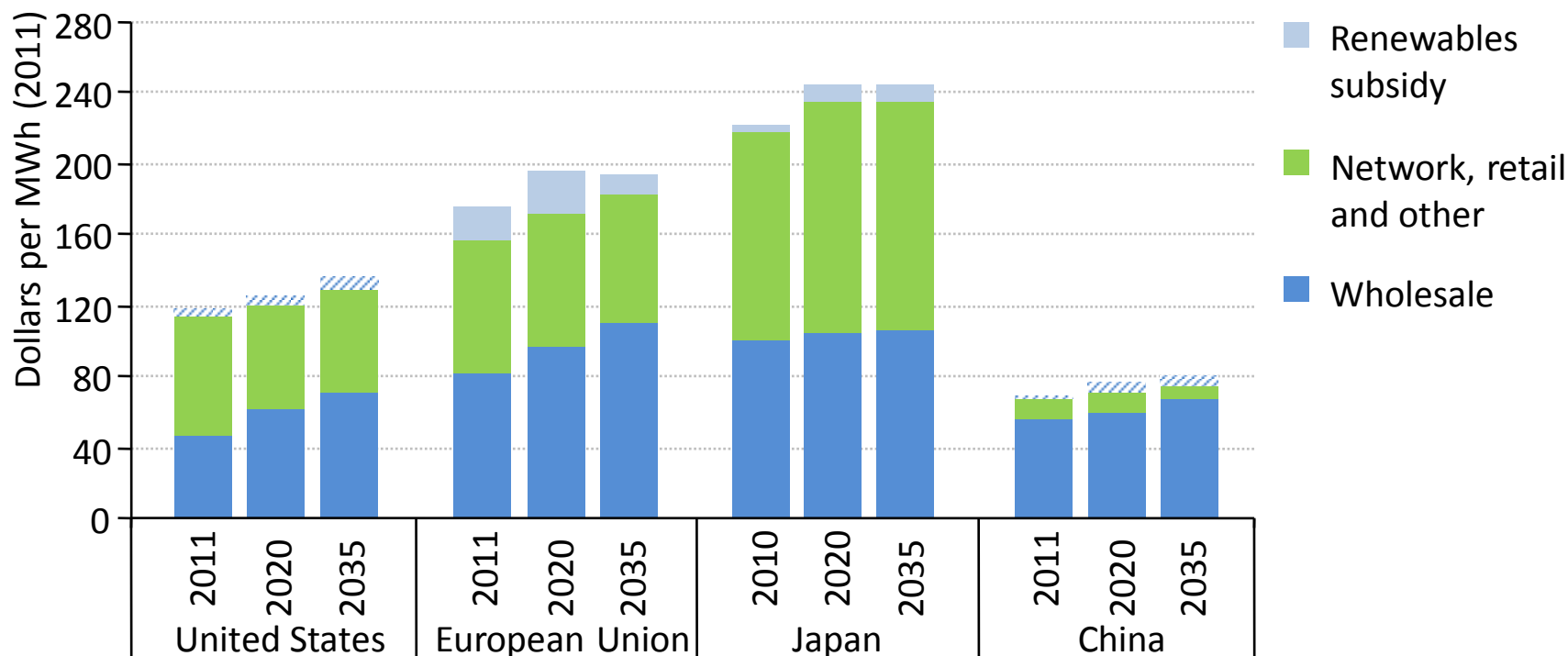
Global renewable subsidies for electricity-generating technologies



Renewable subsidies amount to \$3.6 trillion over 2011-2035 – including \$2.6 trillion already committed to existing projects or needed to meet 2020 targets

Wide variations in the price of power

Average household electricity prices, 2035

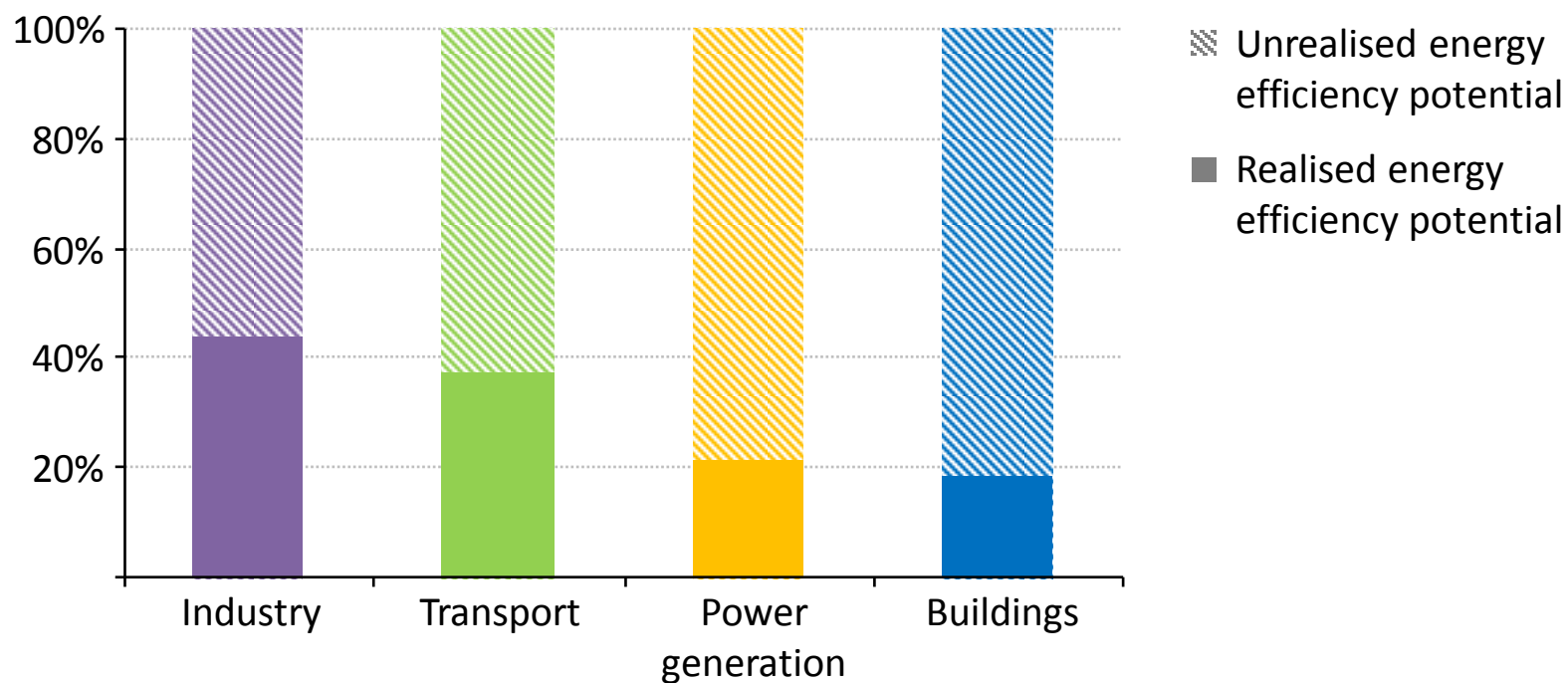


Electricity prices are set to increase with the highest prices persisting in the European Union & Japan, well above those in China & the United States

Energy efficiency: a huge opportunity going unrealised

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Energy efficiency potential used by sector in the New Policies Scenario

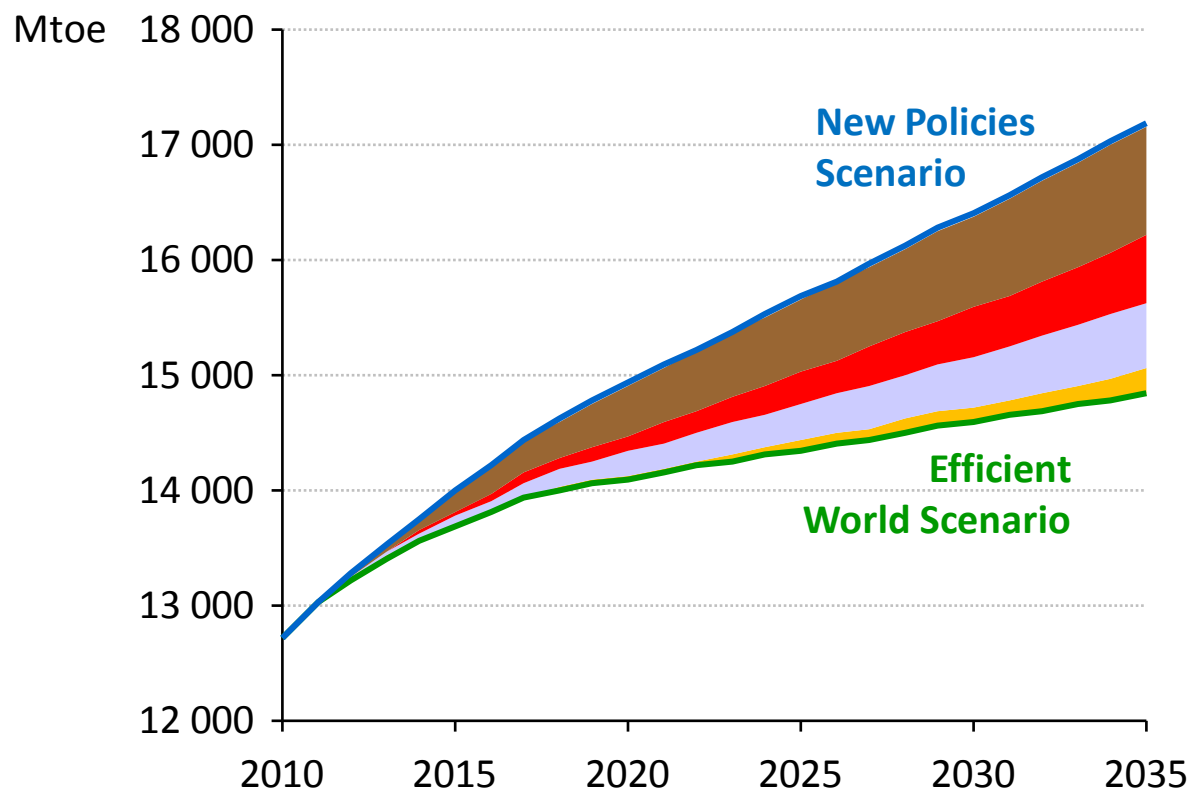


Two-thirds of the economic potential to improve energy efficiency remains untapped in the period to 2035

The Efficient World Scenario: a blueprint for an efficient world

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Total primary energy demand by scenario



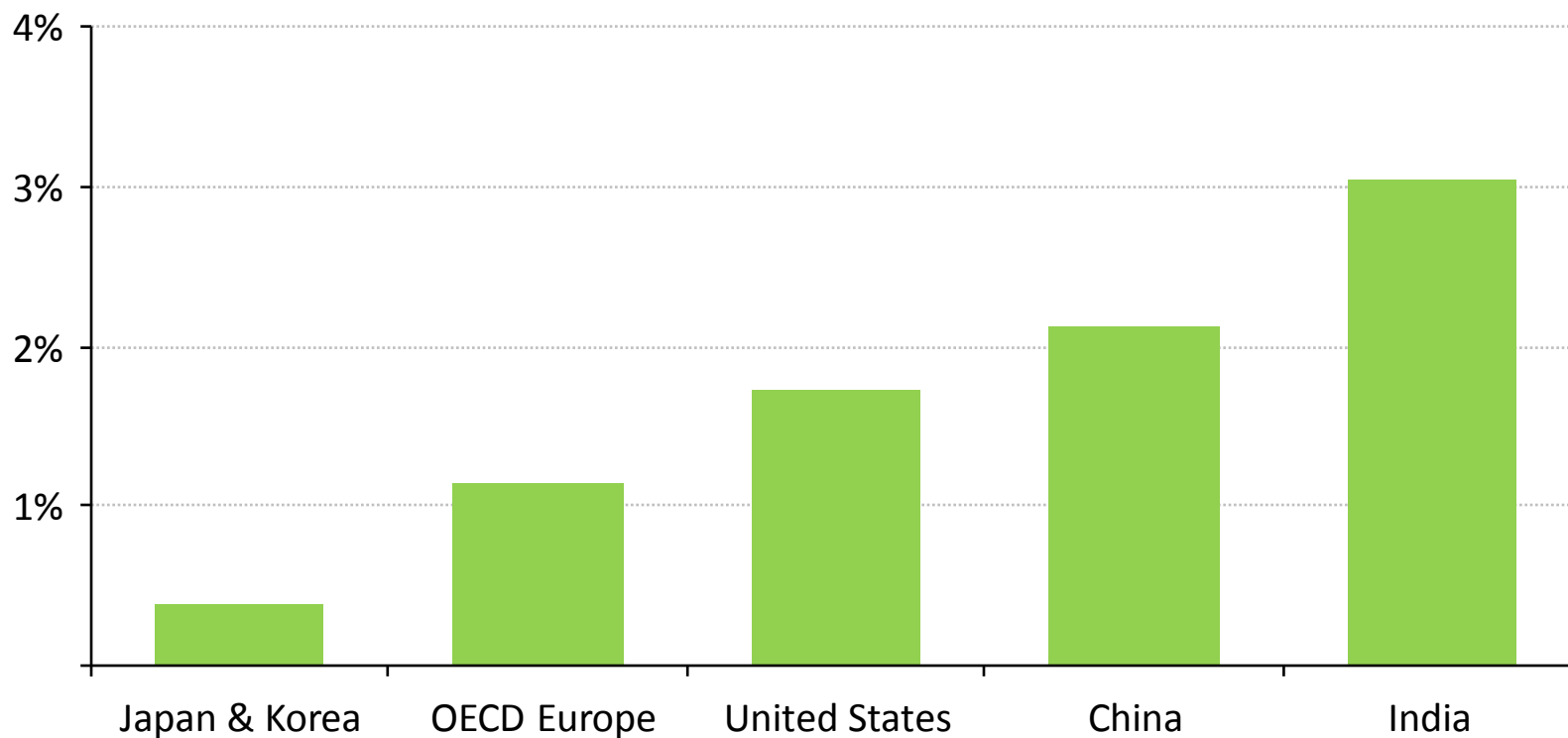
Reduction in 2035	
Coal	1350 Mtce
Oil	12.7 mb/d
Gas	680 bcm
Others	250 Mtoe

***Economically viable efficiency measures can halve energy demand growth to 2035;
oil demand savings equal the current production of Russia & Norway***

Energy efficiency can help drive economic prosperity

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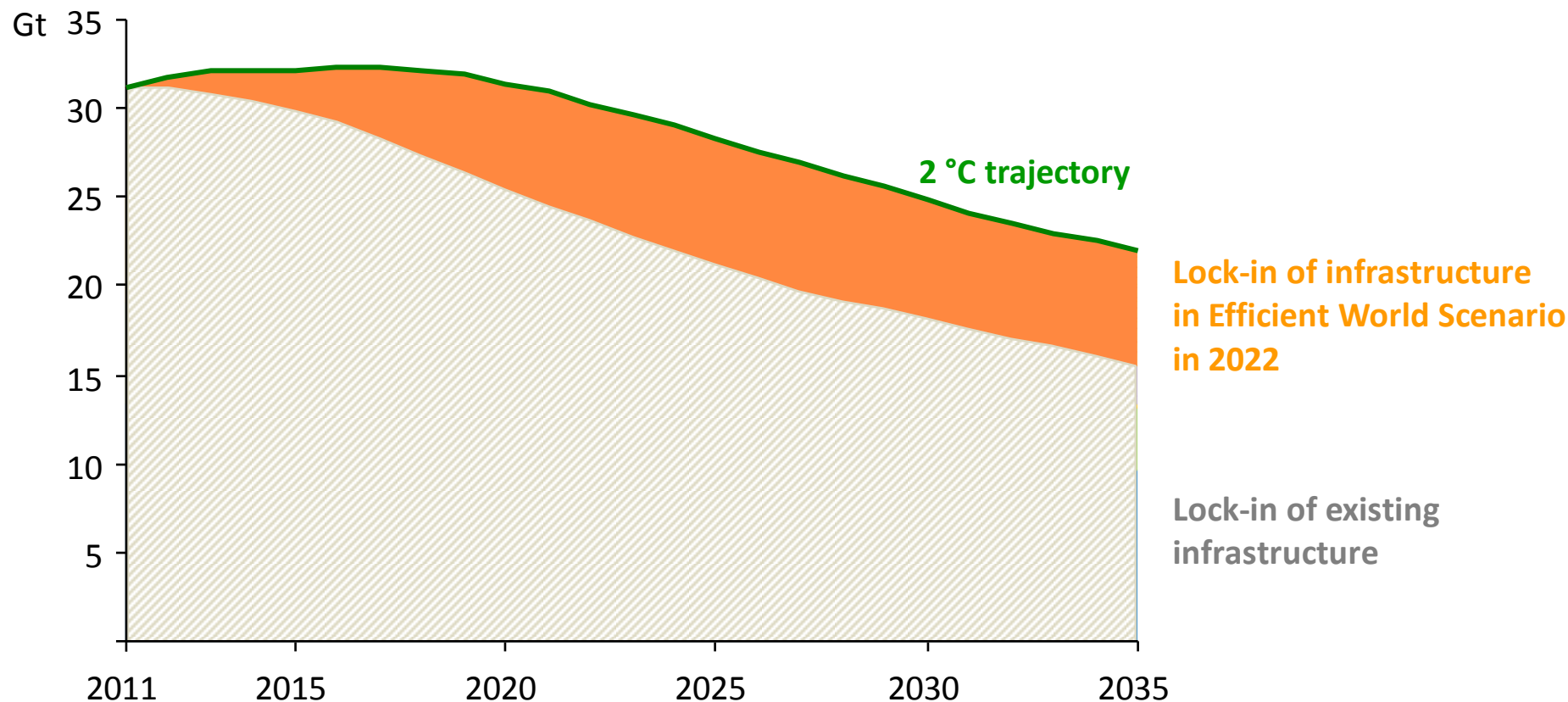
Change in real GDP in the Efficient World Scenario compared with the New Policies Scenario, 2035



Investment in energy efficiency of \$12 trillion is more than offset by fuel savings & triggers cumulative economic growth of \$18 trillion

The Efficient World Scenario delays carbon lock-in

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Energy efficiency can delay “lock-in” of CO₂ emissions permitted under a 2 °C trajectory – which is set to happen in 2017 – until 2022, buying five extra years

Foundations of energy system shifting

- Policy makers face critical choices in reconciling energy, environmental & economic objectives
- Changing outlook for energy production & use may redefine global economic & geopolitical balances
- Iraq set to play a pivotal role in global oil markets
- Power mix set to change, bringing new challenges & opportunities
- As climate change slips off policy radar, the “lock-in” point moves closer & the costs of inaction rise
- The gains promised by energy efficiency are within reach & are essential to underpin a more secure & sustainable energy system