International Energy Agency

REDRAWING THE ENERGY-CLIMATE MAP

Dr. Fatih BIROL
IEA Chief Economist
London, 15 July 2013

World Energy Outlook Special Report

Context

- **Climate change is slipping down the policy agenda, even as the scientific evidence continues to accumulate**
- **Energy sector accounts for two-thirds of greenhouse gas emissions**
- **Mixed news on energy trends**
  - *Price dynamics between gas and coal support emissions reductions in some regions, but impede them in others*
  - *Renewables are on the rise, but investment slowed in 2012*
  - *Efficiency policies are gaining momentum in many countries*
  - *Nuclear is facing challenges and CCS still remains distant*

CO_2 emissions at record high in 2012

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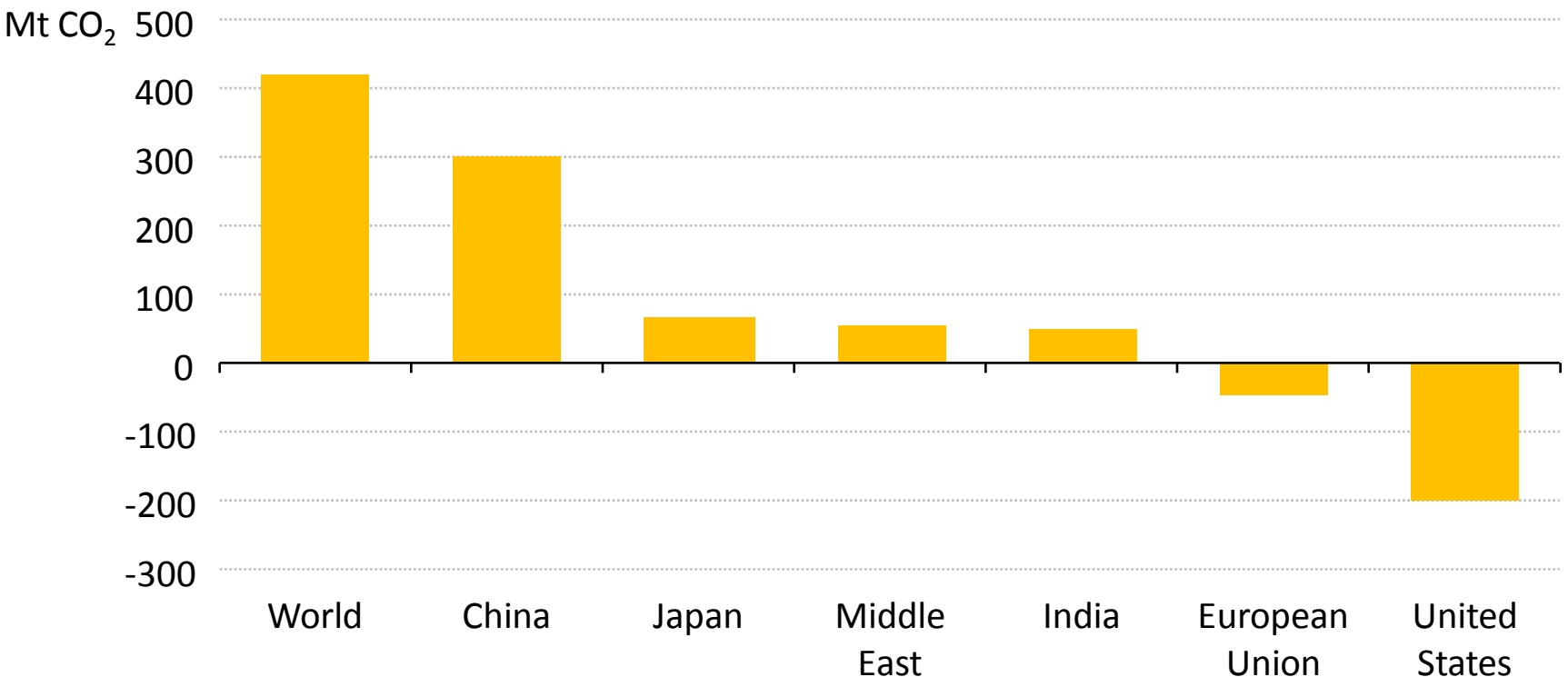
Change in energy-related CO_2 emissions, 2012



CO_2 emissions grew by 1.4% to reach 31.6 Gt in 2012, but trends vary by country

The two largest emitters make encouraging steps toward decarbonisation…

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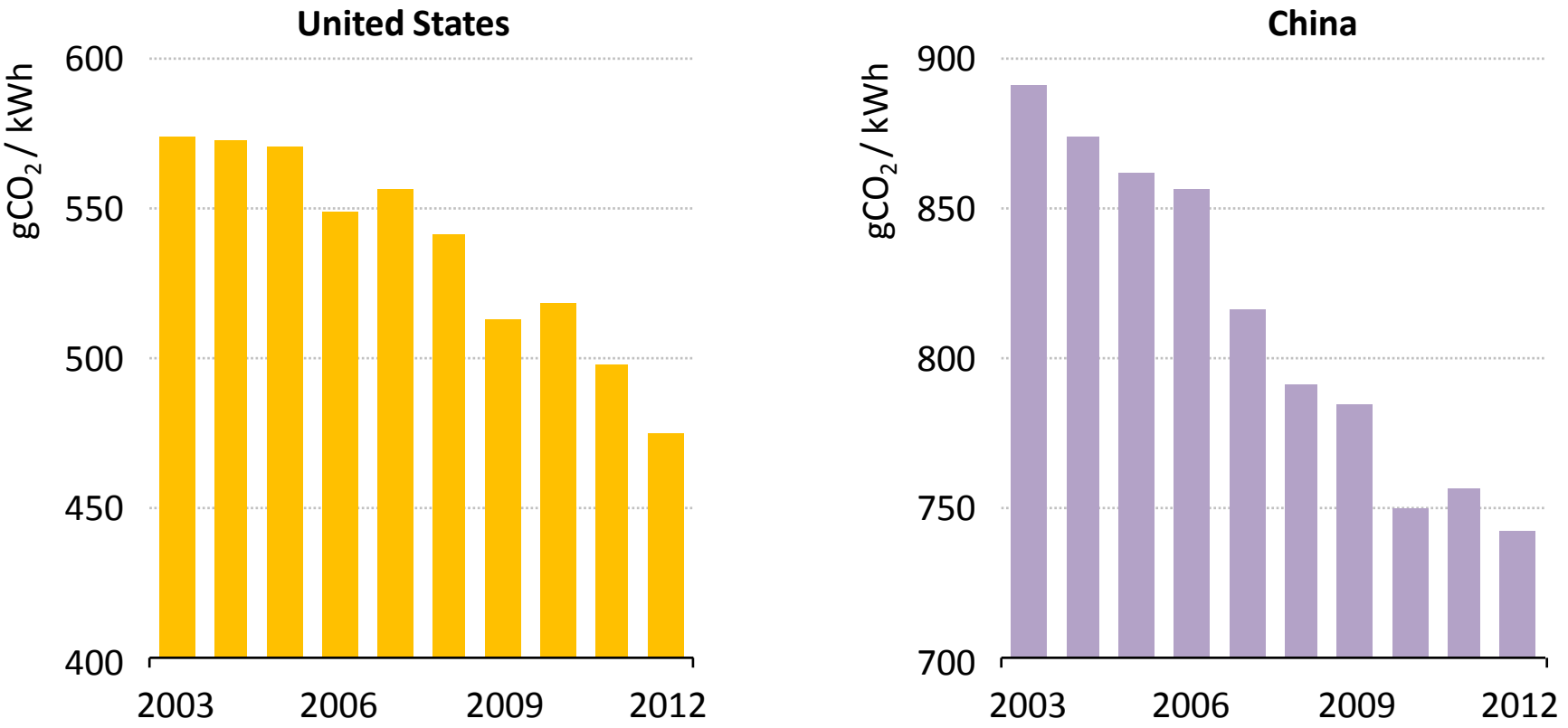
CO_2 emissions per unit of electricity generation



In 2012, total CO_2 emissions in the US were back at the level of the mid-1990s, while total CO_2 emissions growth in China was one of the lowest in the last decade

…but the world is still moving in the wrong direction

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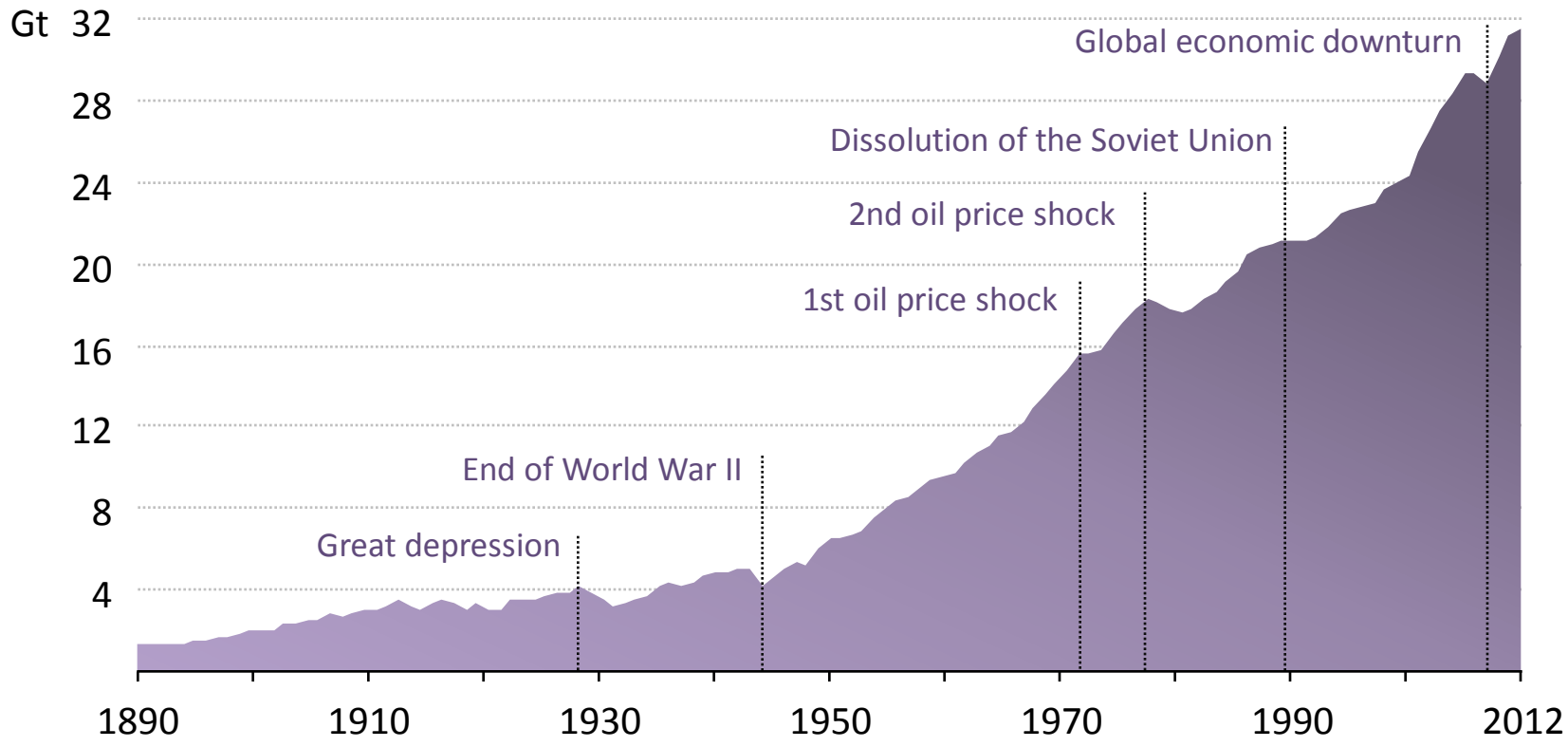
Global energy-related CO_2 emissions



CO_2 emissions trends point to a long-term temperature increase of up to 5.3 °C

Four measures to keep the 2 °C target alive

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- **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:**
  - *Significant near-term emissions reductions*
  - *No harm to countries' economic growth*
  - *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

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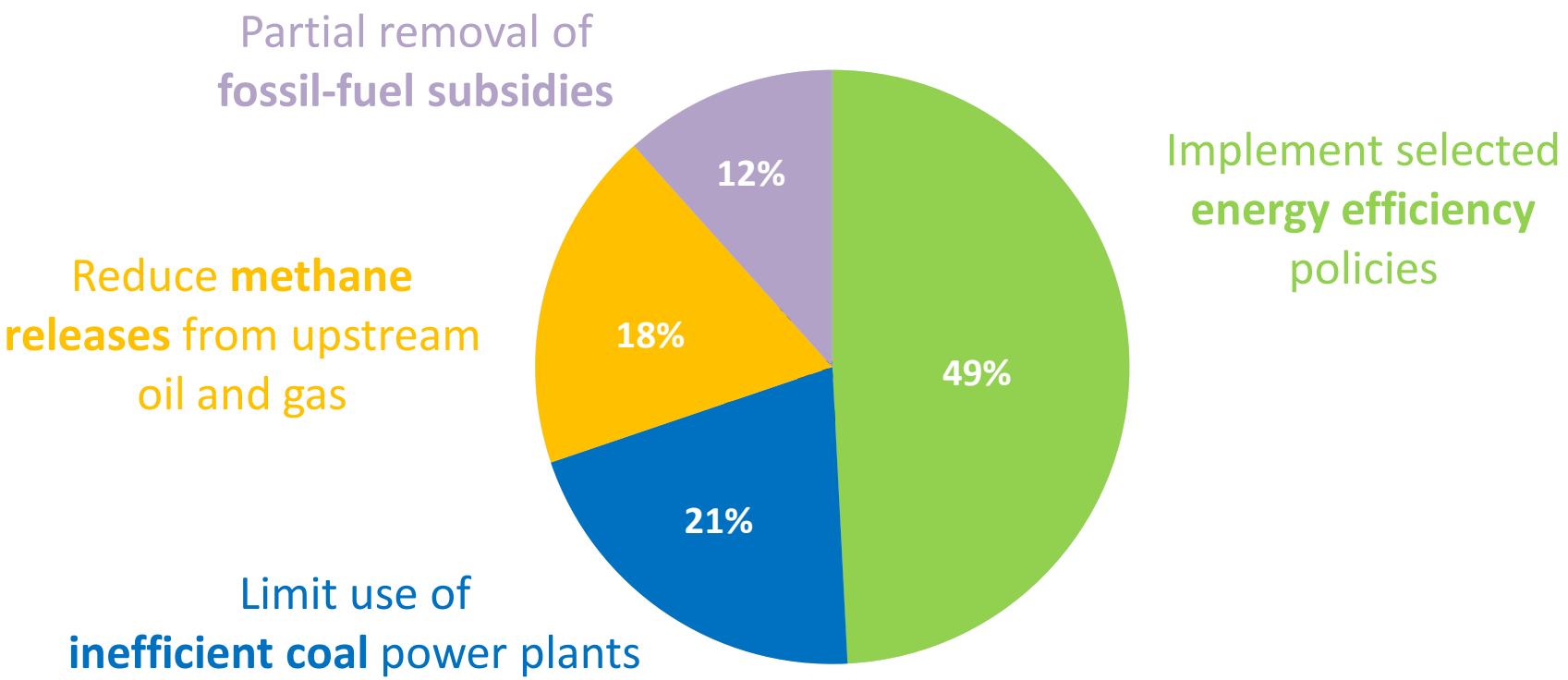
Emissions savings in the 4-for-2 °C Scenario, 2020



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

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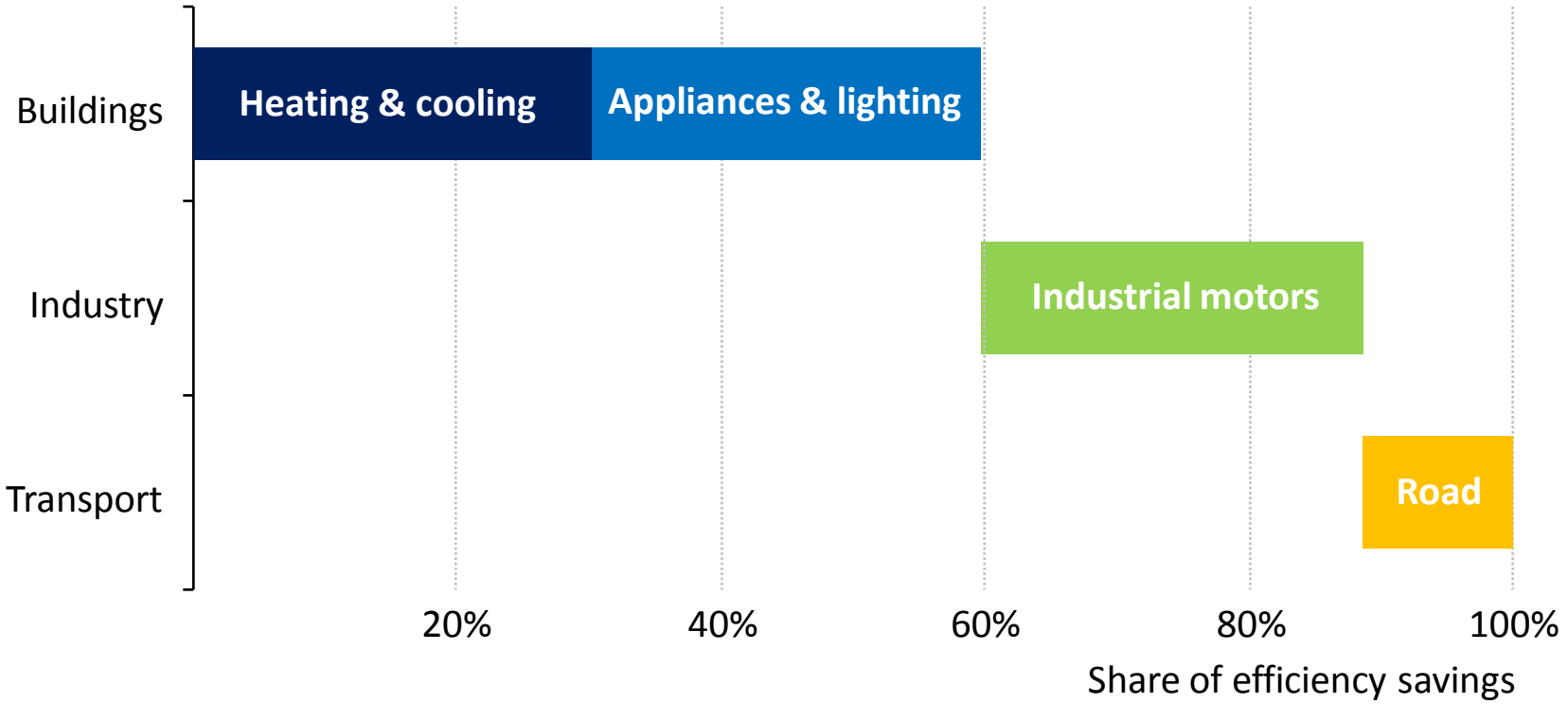
Emissions savings in the 4-for-2 °C Scenario, 2020



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

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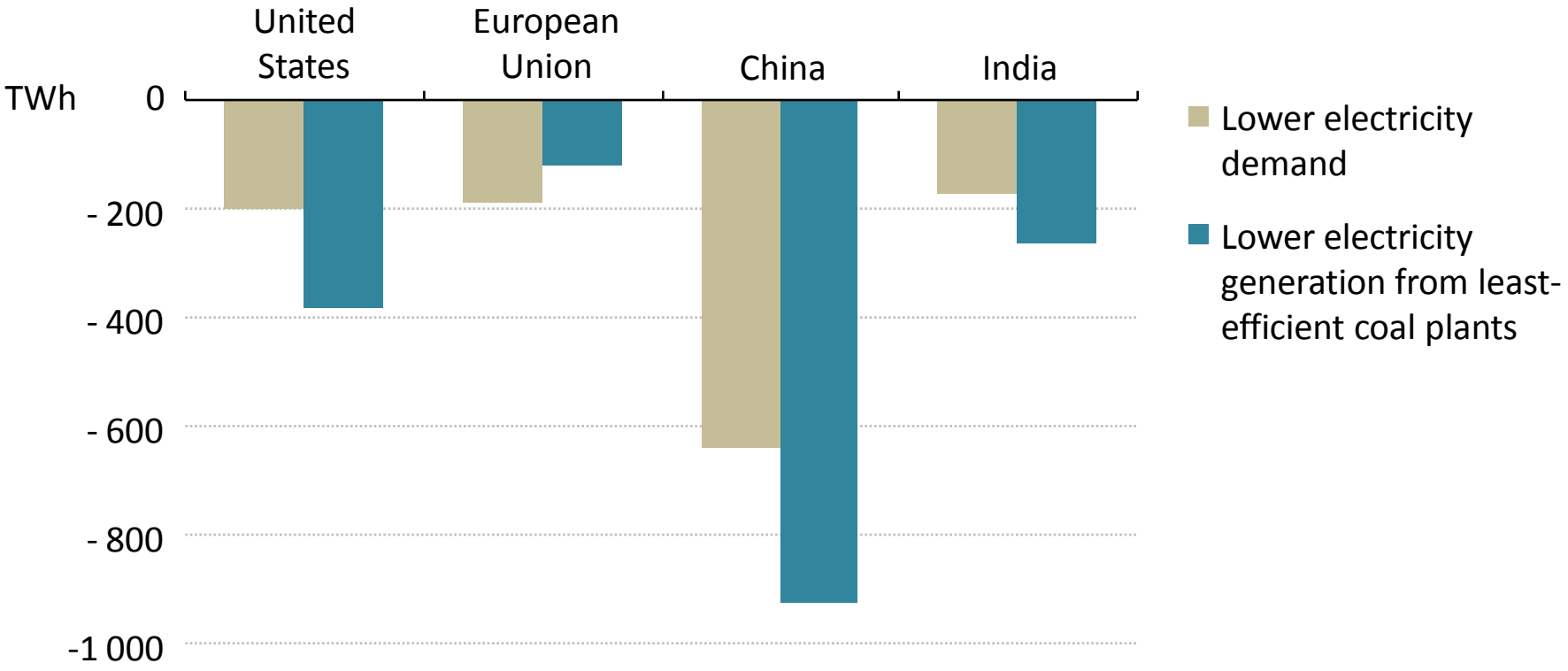
Change in electricity demand & coal-fired electricity generation from the least-efficient plants, 2020



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

Measure 3: Reduce methane releases into the atmosphere

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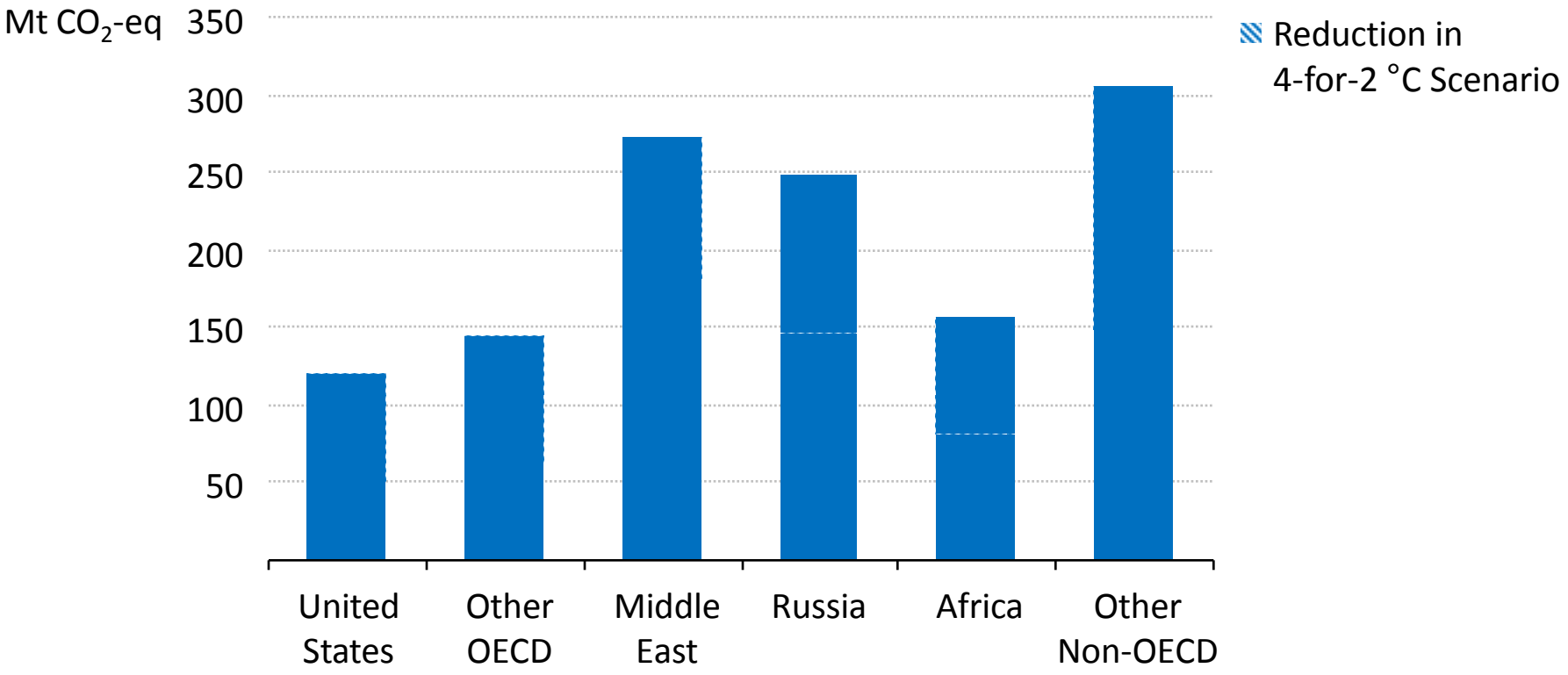
Methane emissions from the upstream oil and gas industry, 2020



In 2010, methane releases were 1.1 Gt CO_2-eq; halving the level in 2020 would save twice the gas production of Nigeria today

Measure 4: Phase out fossil-fuel subsidies

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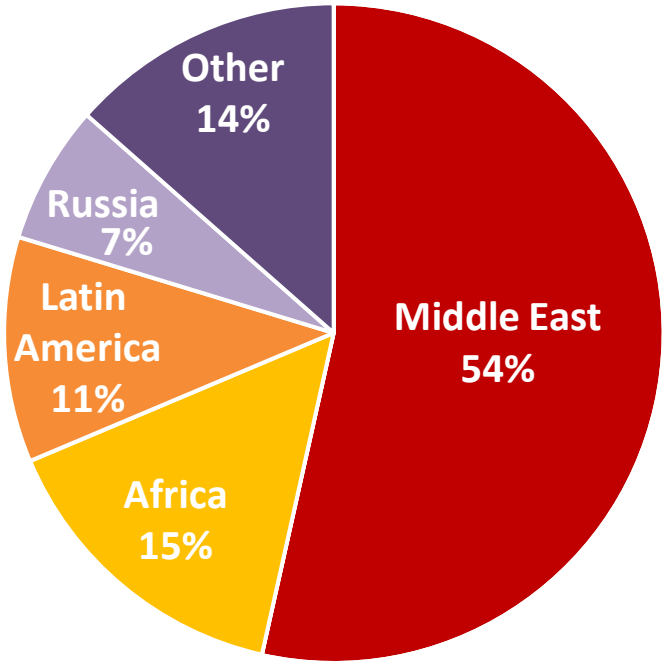
Savings in the 4-for-2 °C Scenario: 360 Mt



Fossil-fuel subsidies in 2011 were equivalent to an incentive of $110 per tonne of CO_2

The energy sector needs to adapt to climate change

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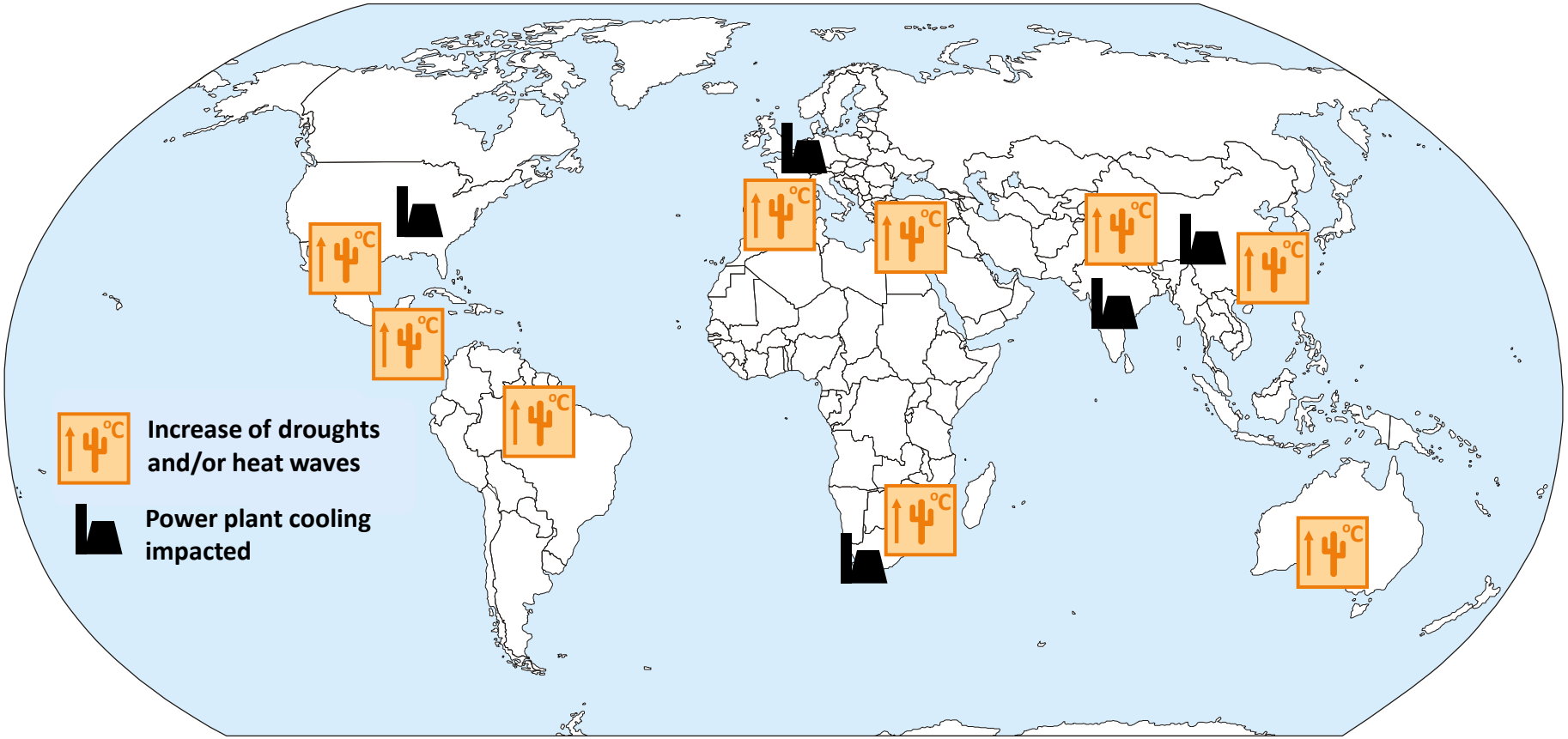

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The energy sector needs to increase its resilience to the physical impacts of climate change

The energy sector needs to adapt to climate change

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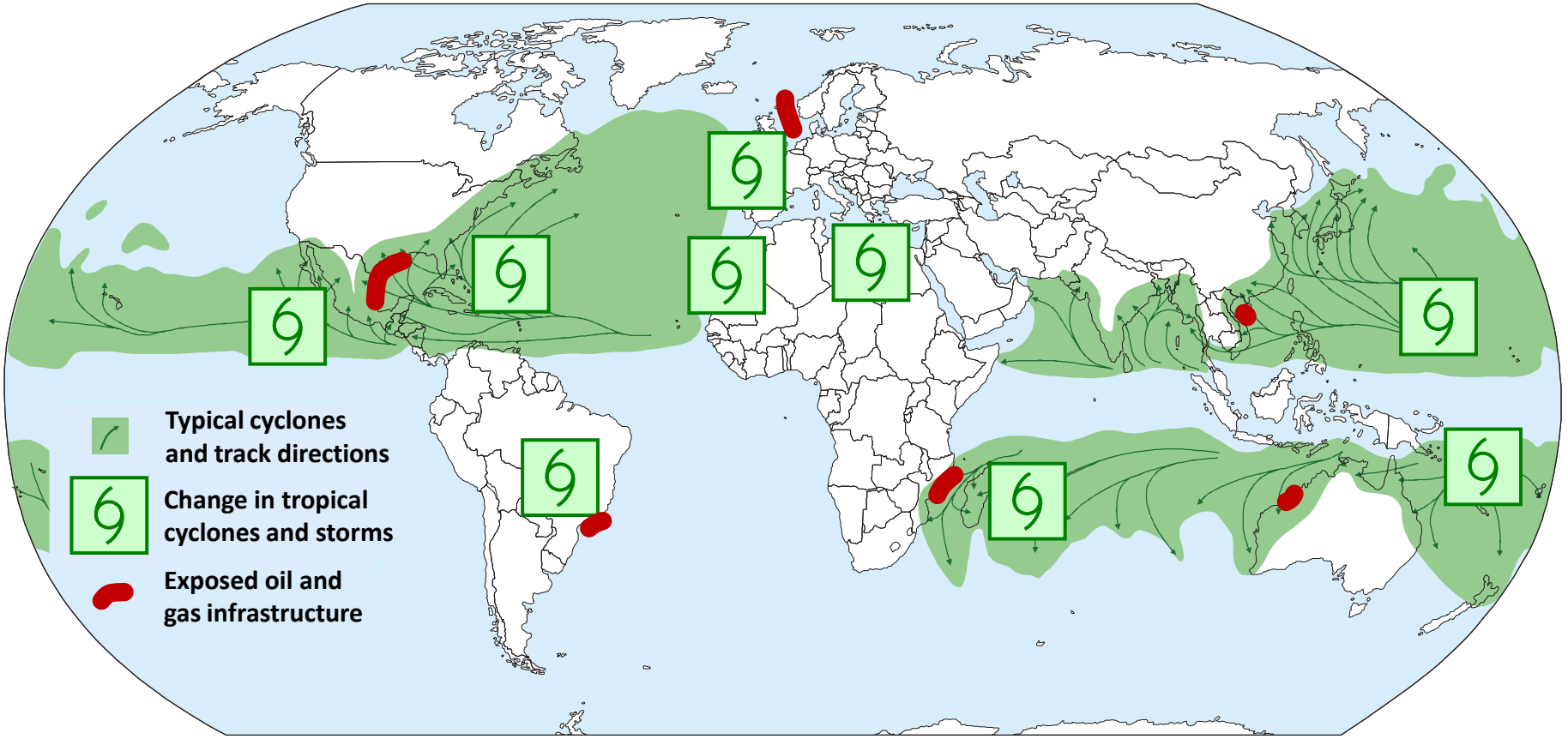

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The energy sector needs to increase its resilience to the physical impacts of climate change

Some fossil-fuel reserves remain underground

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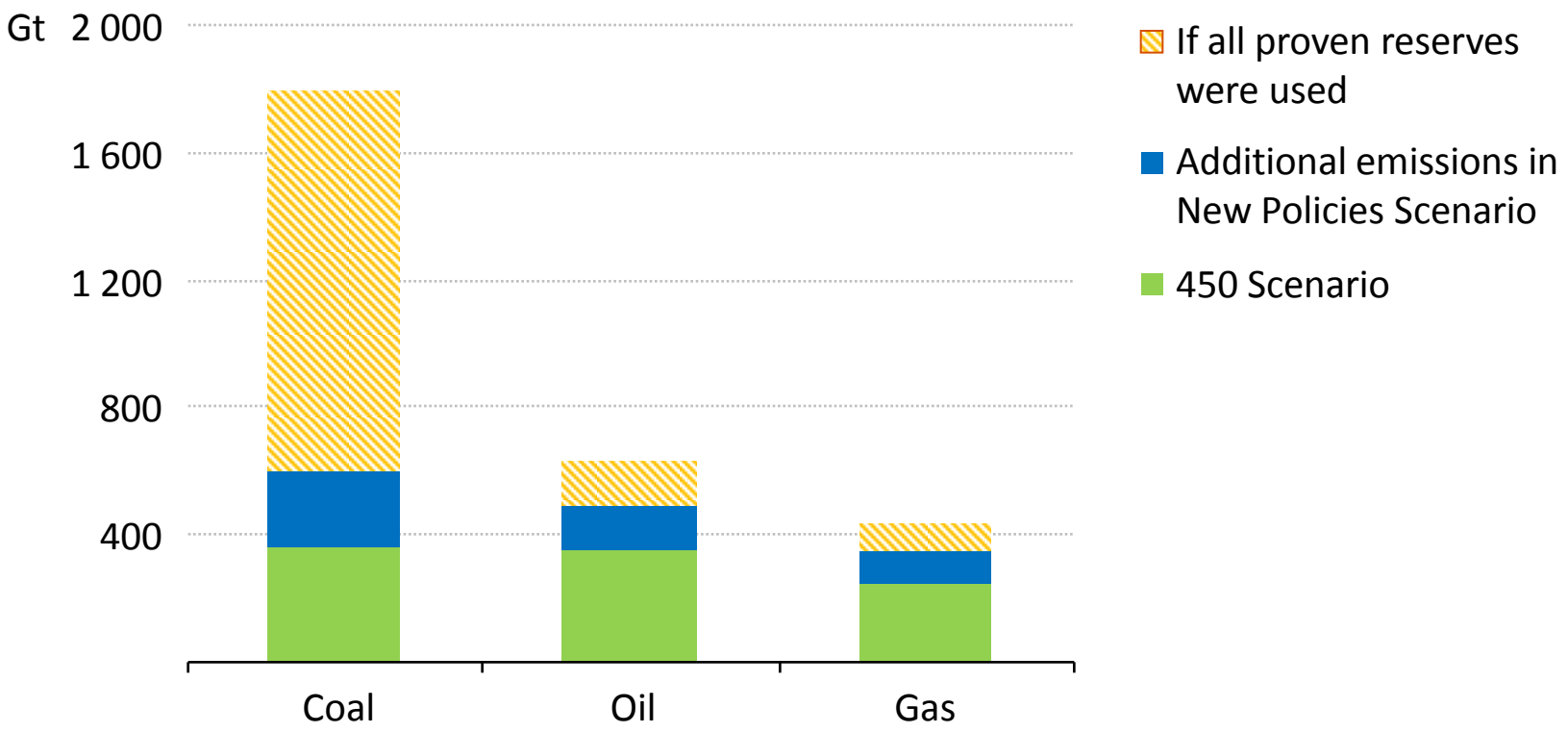
Potential CO_2 emissions from proven fossil-fuel reserves to 2050



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

Key messages

- Despite encouraging steps in some countries, global emissions keep rising and the scientific evidence of climate change increases
- Early national action is required while negotiating towards a global deal in Paris in 2015 that then comes into force by 2020
- Four measures can stop emissions growth by 2020 and keep the 2°C target alive, without harming economic growth
- There is a need for parallel action to deploy critical low-carbon technologies at scale after 2020, including CCS
- The energy sector must adapt to climate change, both in the resilience of its existing assets and in future investment decisions

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