ENERGY & ENVIRONMENT

Meeting the Climate Challenge:

A FOCUS ON ENERGY EFFICIENCY AND GAS

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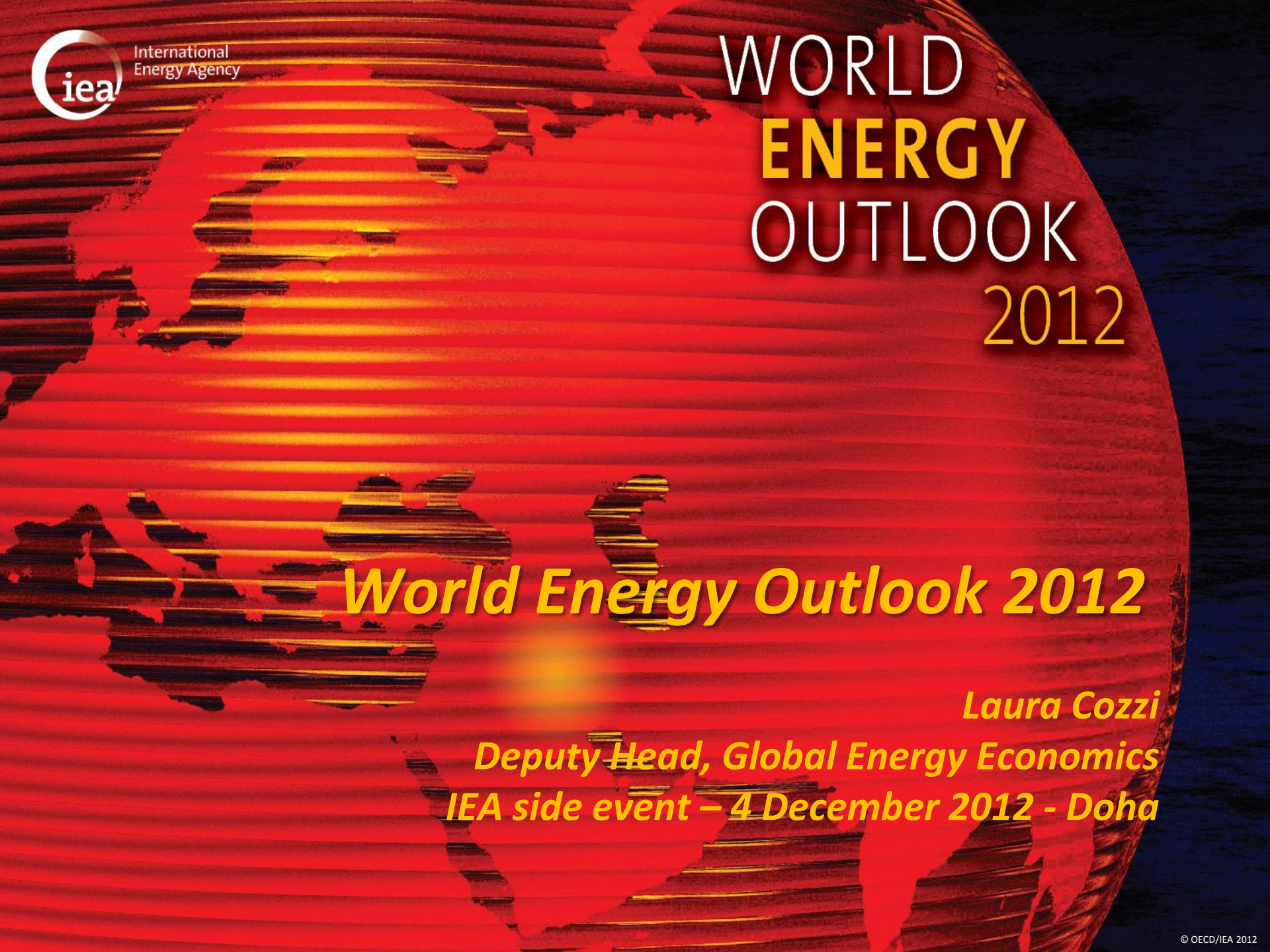
INTERNATIONAL ENERGY AGENCY
SIDE EVENT
Tuesday, 4 December 2012
Qatar National Convention Centre Doha

International Energy Agency



World Energy Outlook 2012

Laura Cozzi
Deputy Head, Global Energy Economics
IEA side event – 4 December 2012 - Doha

The context

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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*
  - *CO_2 emissions at record high, while renewables industry under strain*
  - *Despite new international efforts, 1.3 billion people still lack electricity*
  - *Water increasingly crucial for assessing the viability of energy projects*

The energy mix is (slowly) changing

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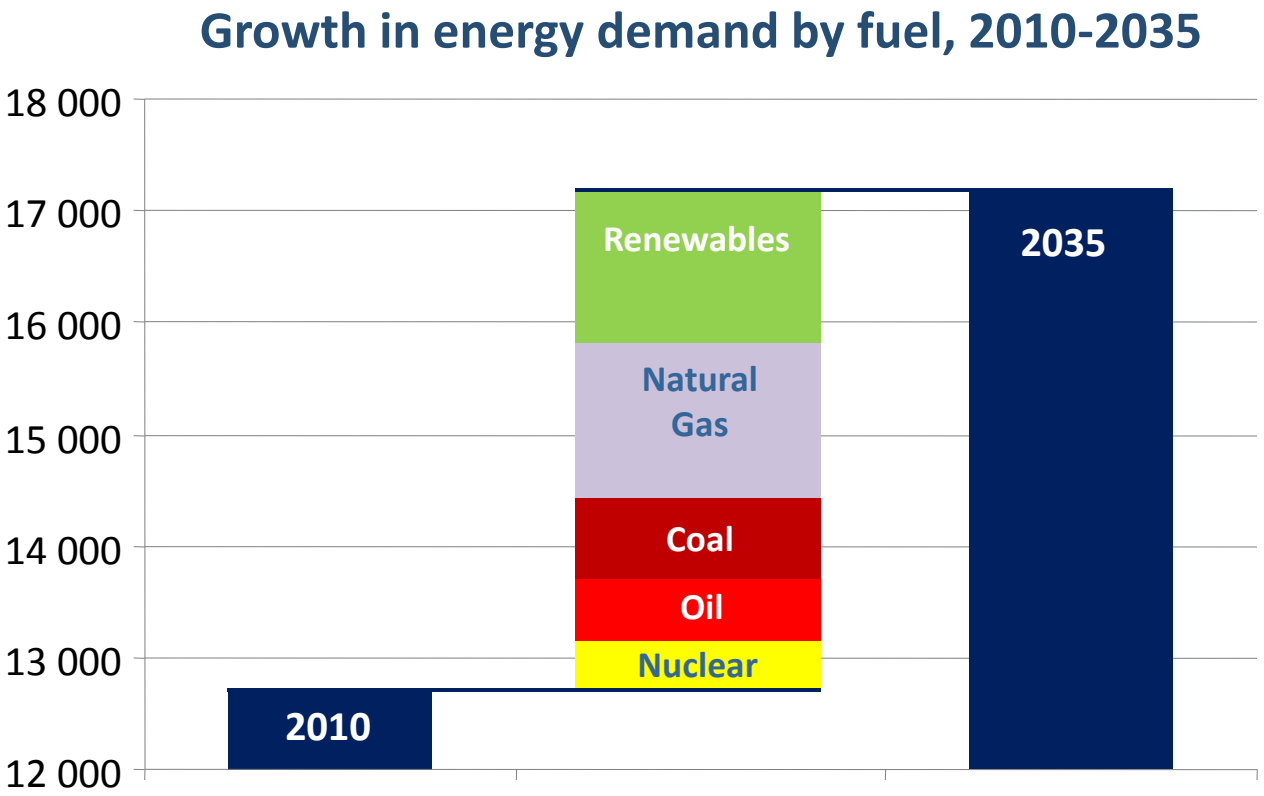

Global energy demand grows by more than one-third over the period to 2035, with China, India & the Middle East accounting for 60% of the increase

Energy efficiency: a huge opportunity going unrealised

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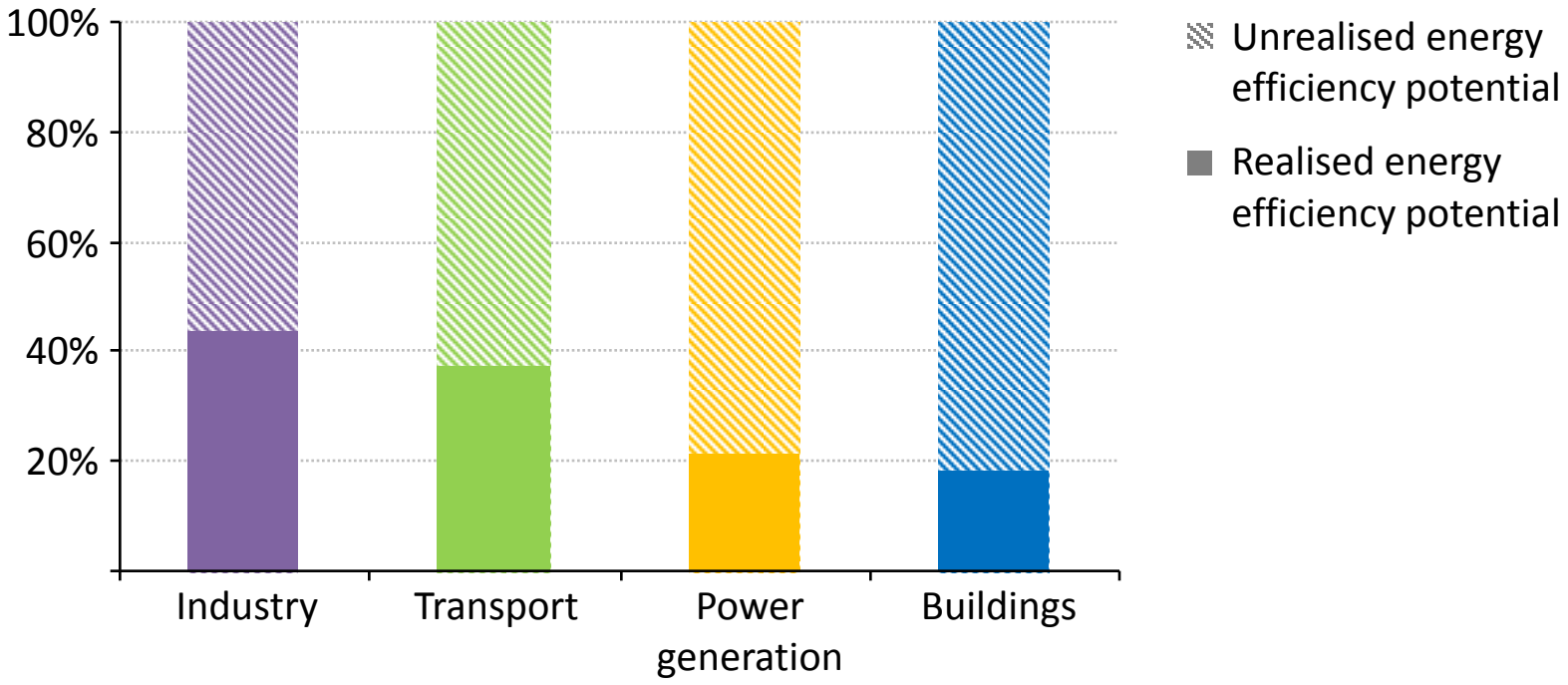
Energy efficiency potential used by sector in the New Policies Scenario



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

Making energy efficiency a reality

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- **Good governance**
  - *Government leadership, effective co-ordination & administrative capacity*
- **Consumer priority**
  - *Increase visibility of efficiency and its economic gains*
- **Affordability**
  - *Availability of financing instruments & subsidies removal*
- **Make it the norm**
  - *Introduce, monitor and enforce standards that will embed efficiency*

The Efficient World Scenario: a blueprint for an efficient world

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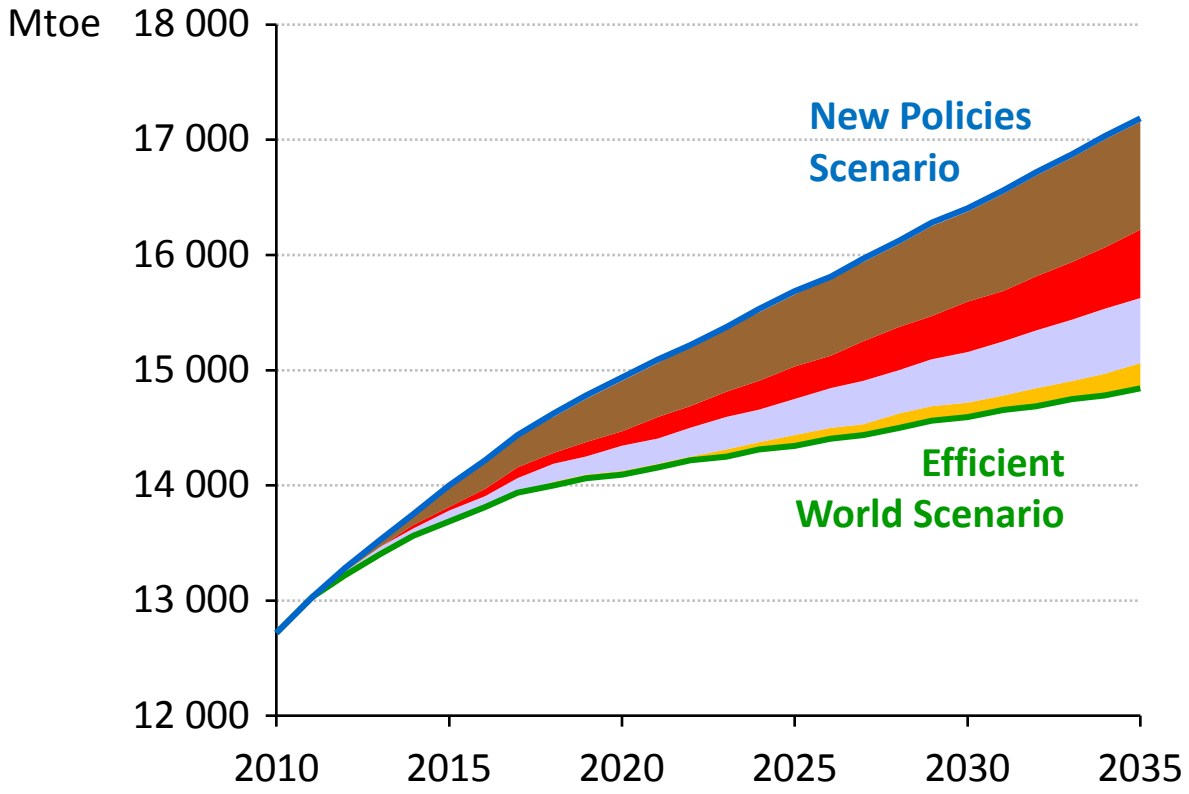
Total primary energy demand



Reduction in 2035		
Coal	1 350	Mtce
Oil	12.7	mb/d
Gas	680	bcm
Others	250	Mtoe

Economically viable efficiency measures can halve energy demand growth to 2035; oil prices are $15 per barrel lower by 2035 due to oil demand savings

Energy efficiency can help drive economic prosperity

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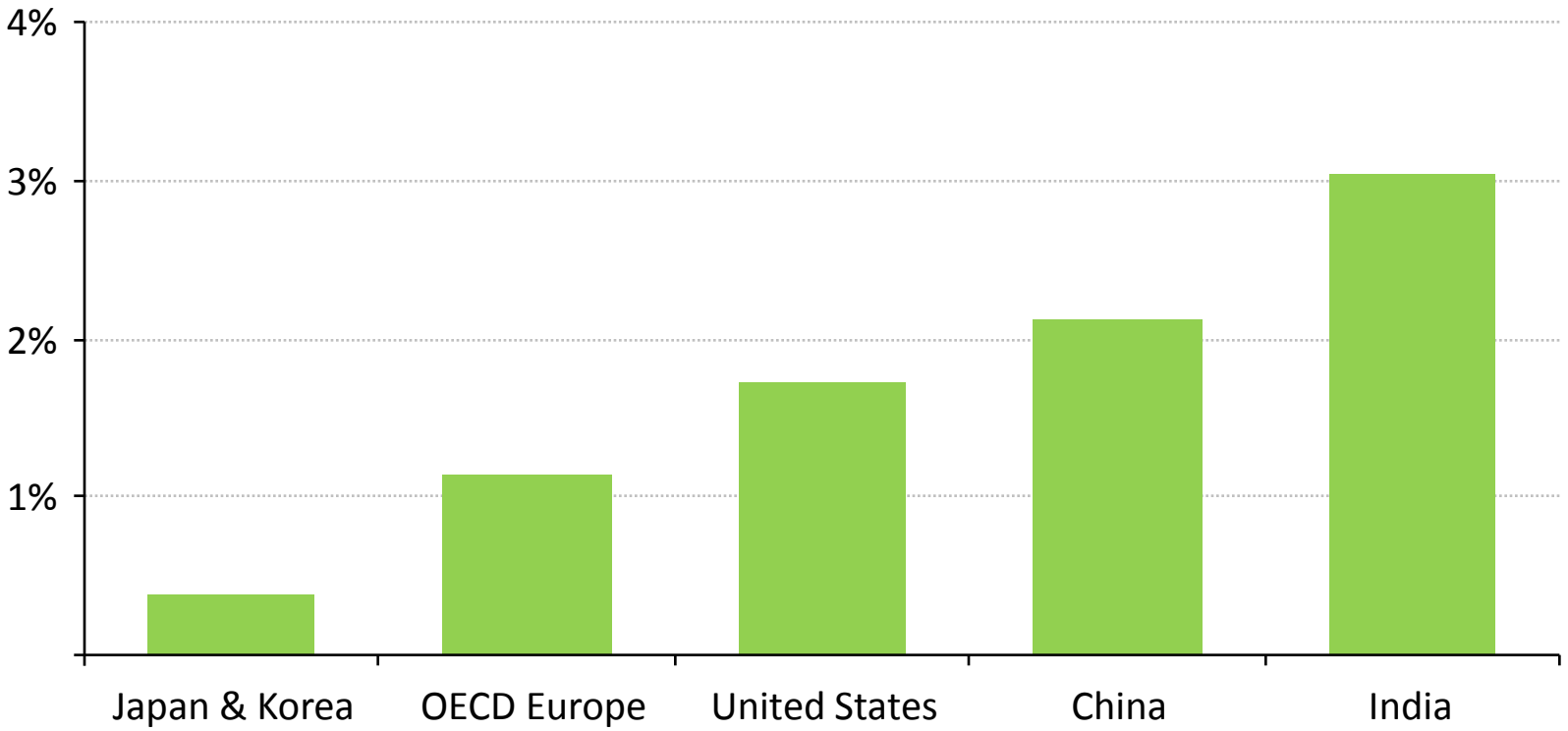
GDP in Efficient World Scenario versus New Policies Scenario, 2035



Cumulative investments in energy efficiency of $12 trillion are more than offset by fuel savings & trigger economic growth of a cumulative $18 trillion

The Efficient World Scenario delays carbon lock-in

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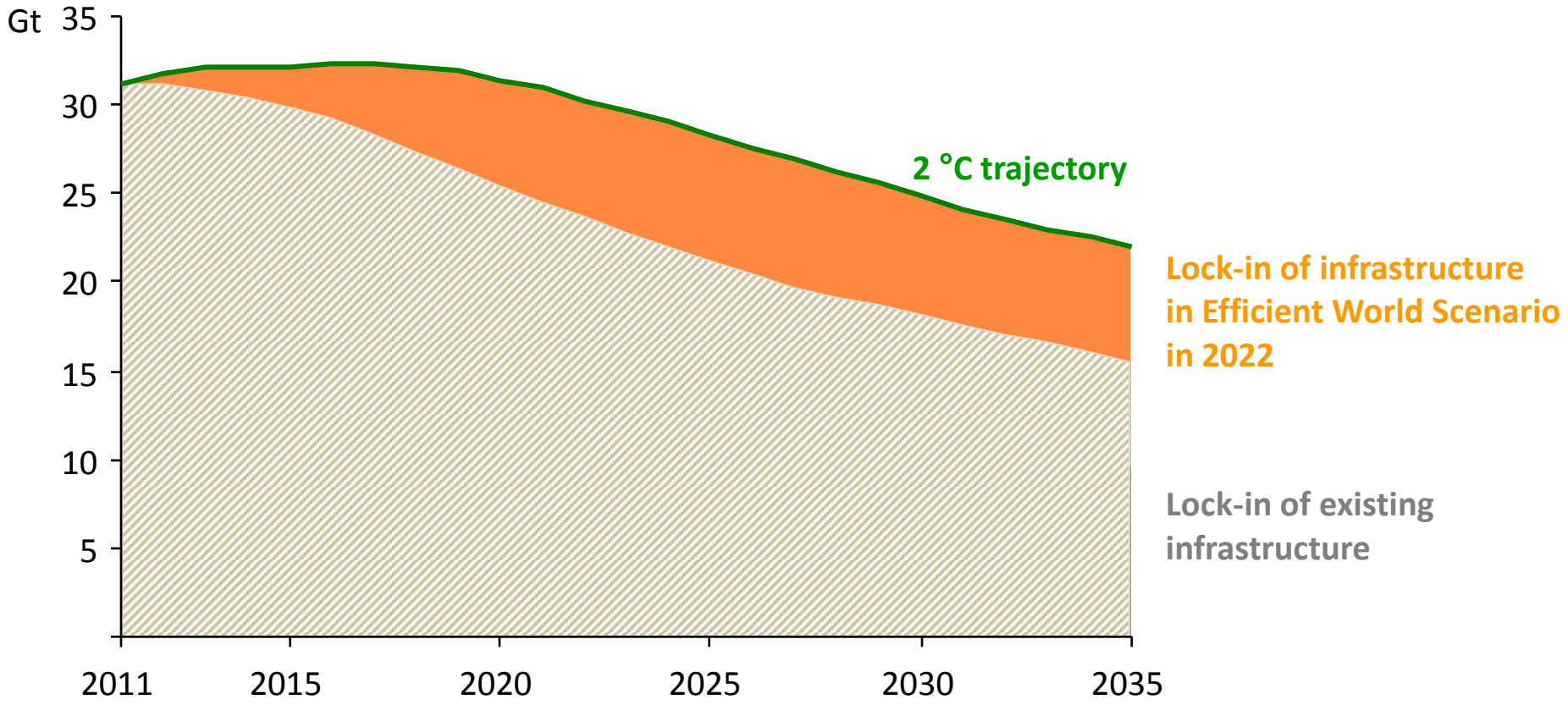

Energy efficiency can delay "lock-in" of CO_2 emissions permitted under a 2 °C trajectory – which is set to happen in 2017 – until 2022, buying five extra years

The Efficient World Scenario is not yet 450

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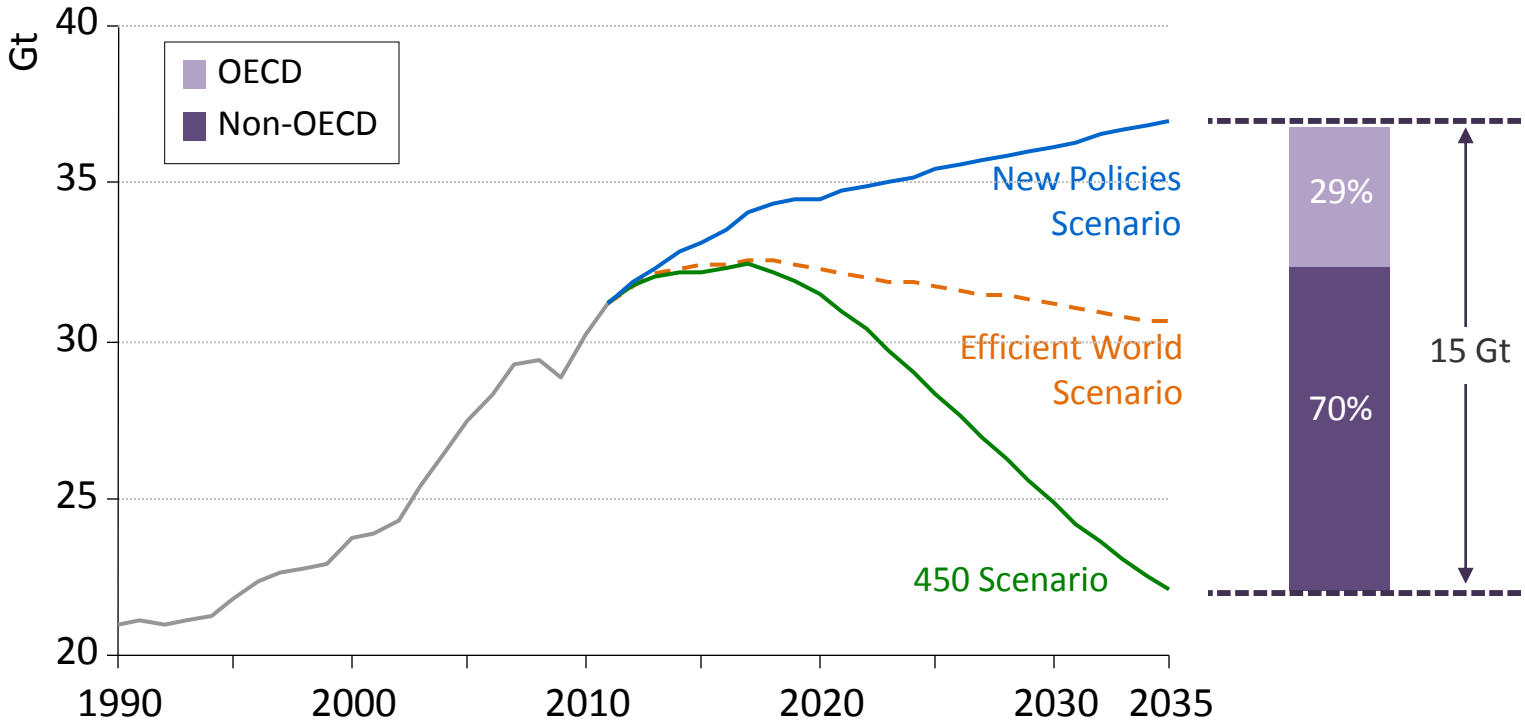
Global energy-related CO_2 emissions by scenario



Energy efficiency can delay CO_2 "lock-in", but efficiency alone is not sufficient to meet climate goals.

Energy Efficiency: 'Great Expectations'

- **Energy efficiency is a well established approach to reducing GHG emissions – progress has been made**
- **Energy efficiency is the perennial low-hanging fruit**
- **In the WEO's 450 Scenario energy efficiency delivers nearly 3/4 of emissions reductions in 2020.**

Critical steps to implementation

- **To realise the vast unmet energy efficiency potential:**

1. **Make it a priority**
2. **Fuller economic articulation of EE –multiple benefits (savings, budget, energy security), as well as rebound effects**
3. **Increase visibility; increase its appeal**
4. **Commitment and perseverance**
5. **More financing for EE projects, including climate funds**
6. **Assess, adjust, and adapt policy approaches**
7. **Institutional capacity**
8. **Creates a new normal – impact of behavior**

Natural gas: towards a globalised market

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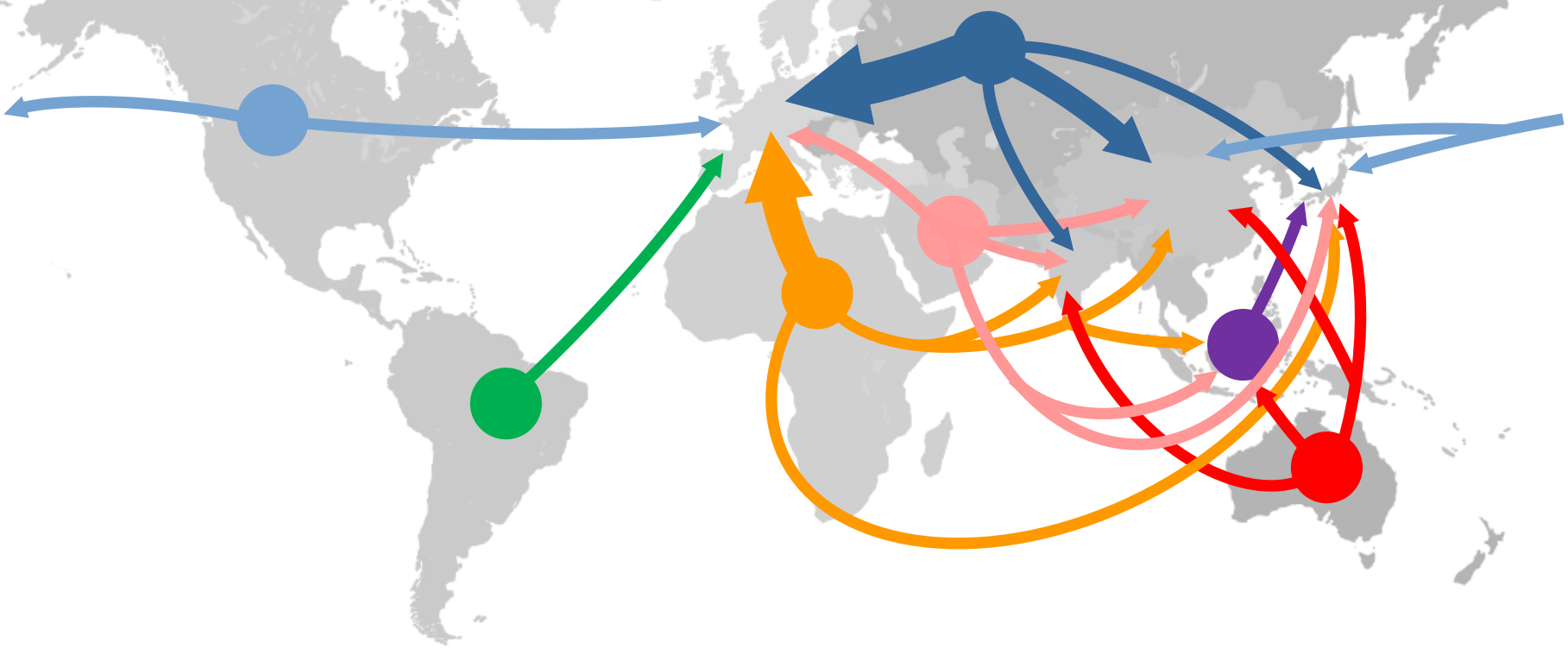
Major global gas trade flows, 2035



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

US: gas (and renewables) contributing to emissions reductions

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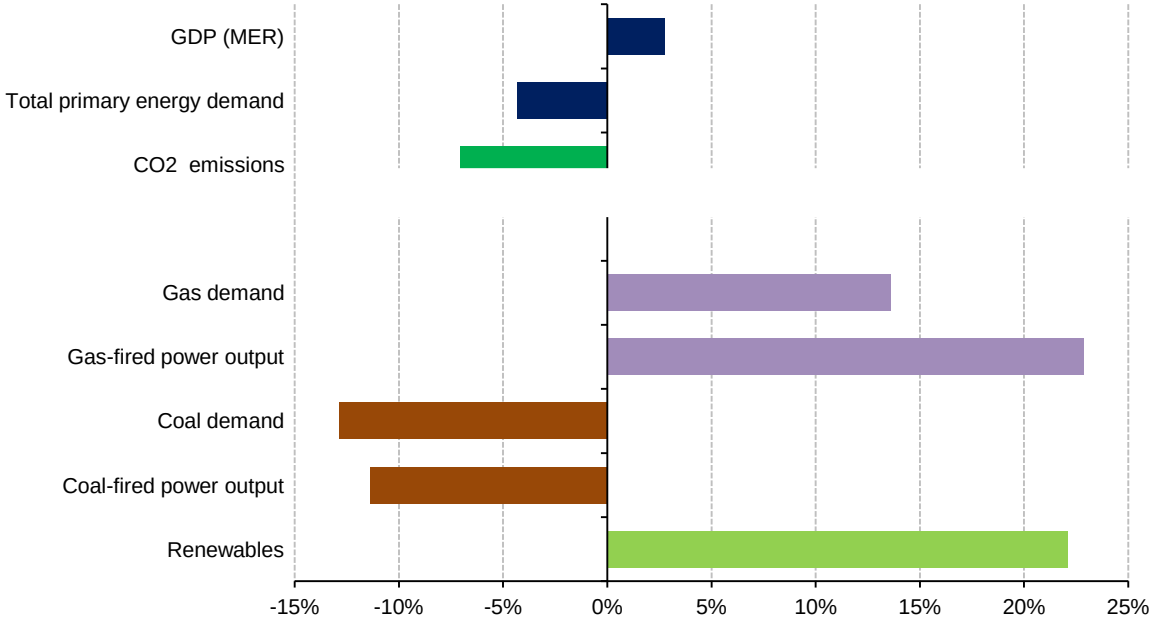
Change in selected energy indicators, 2006-2011



Unconventional gas is being instrumental in helping reducing overall energy-related emissions in the US, but gas alone isn't enough to reduce deep reductions

How much more can we burn?

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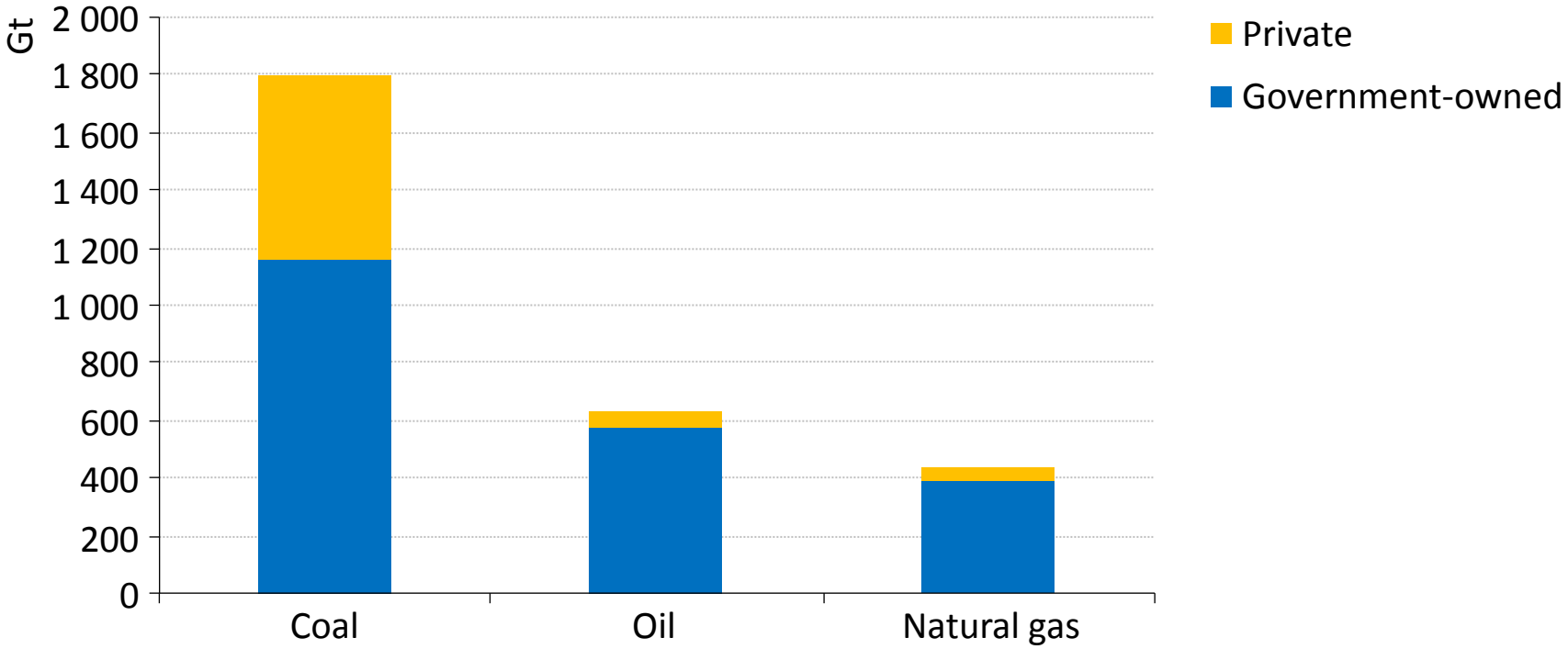
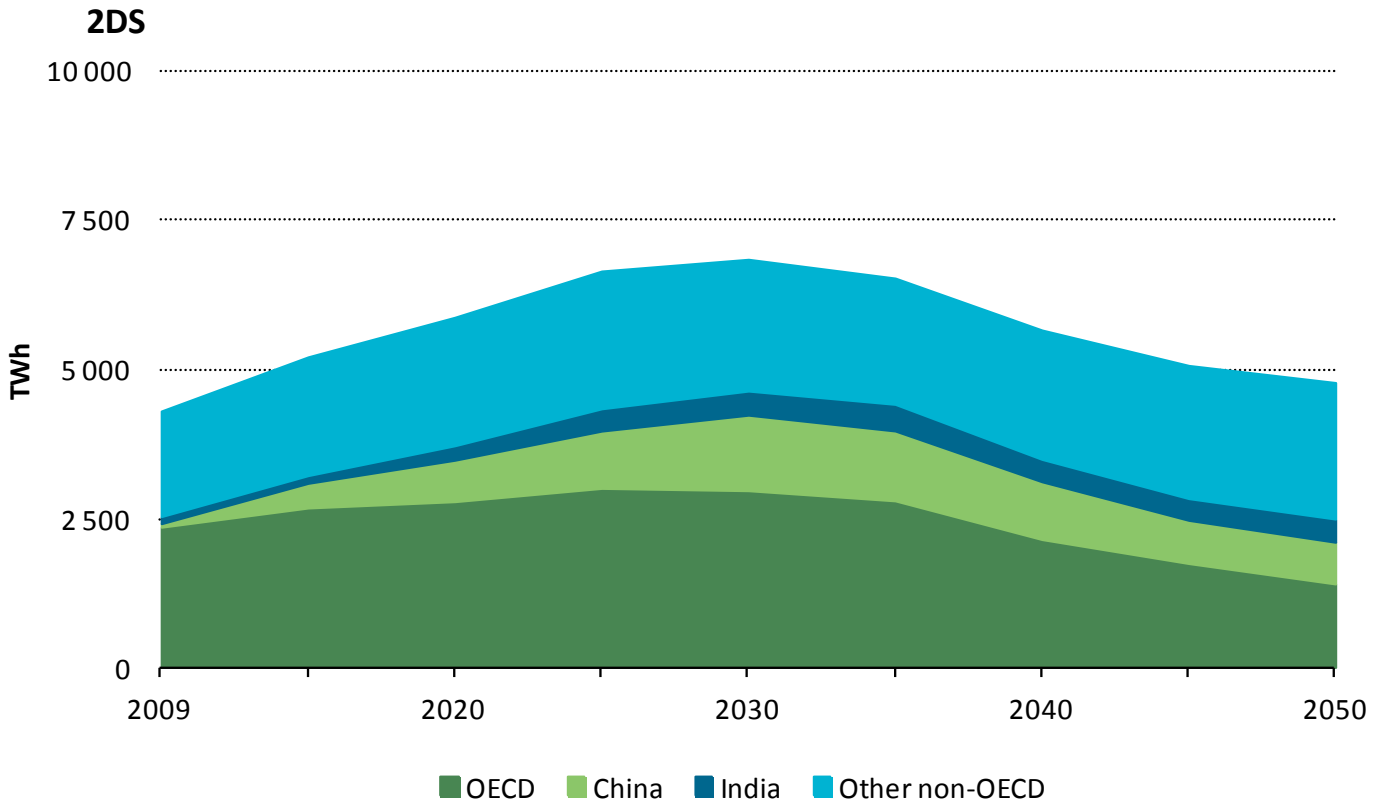
Potential CO_2 emissions from remaining fossil-fuel reserves by fuel type



More than two-thirds of current proven fossil-fuels reserves cannot be commercialised before 2050 in the 450 Scenario.

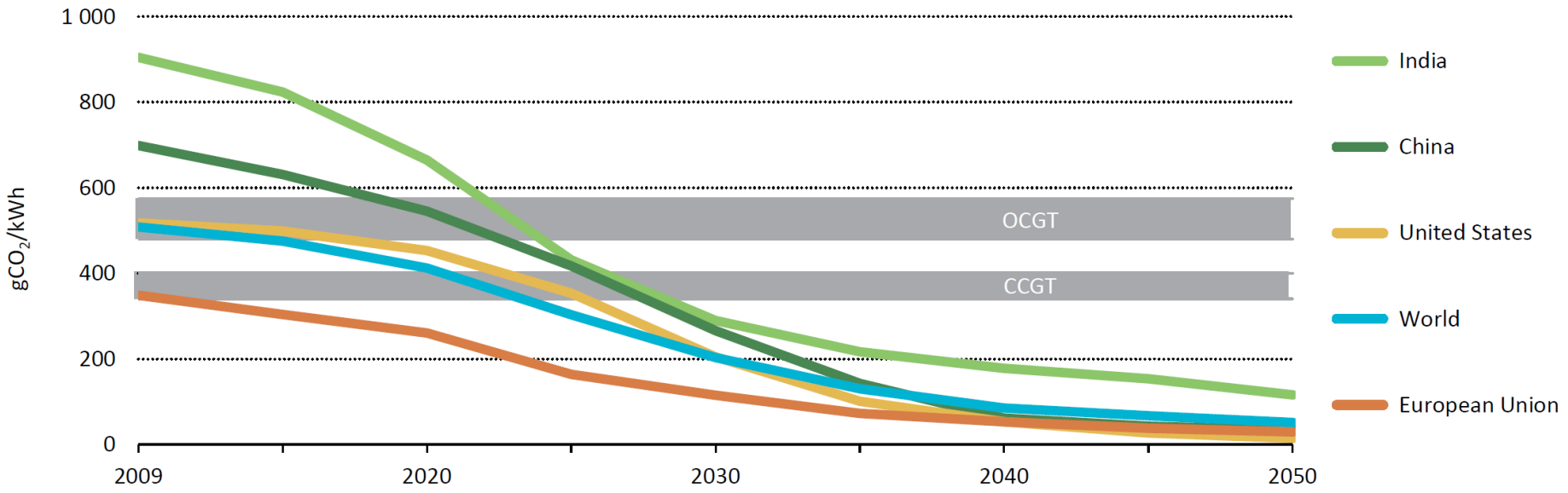
Profile of natural gas evolves in the 2DS



Natural gas-fired power generation must decrease after 2030 to meet the CO2 emissions projected in the 2DS scenario.

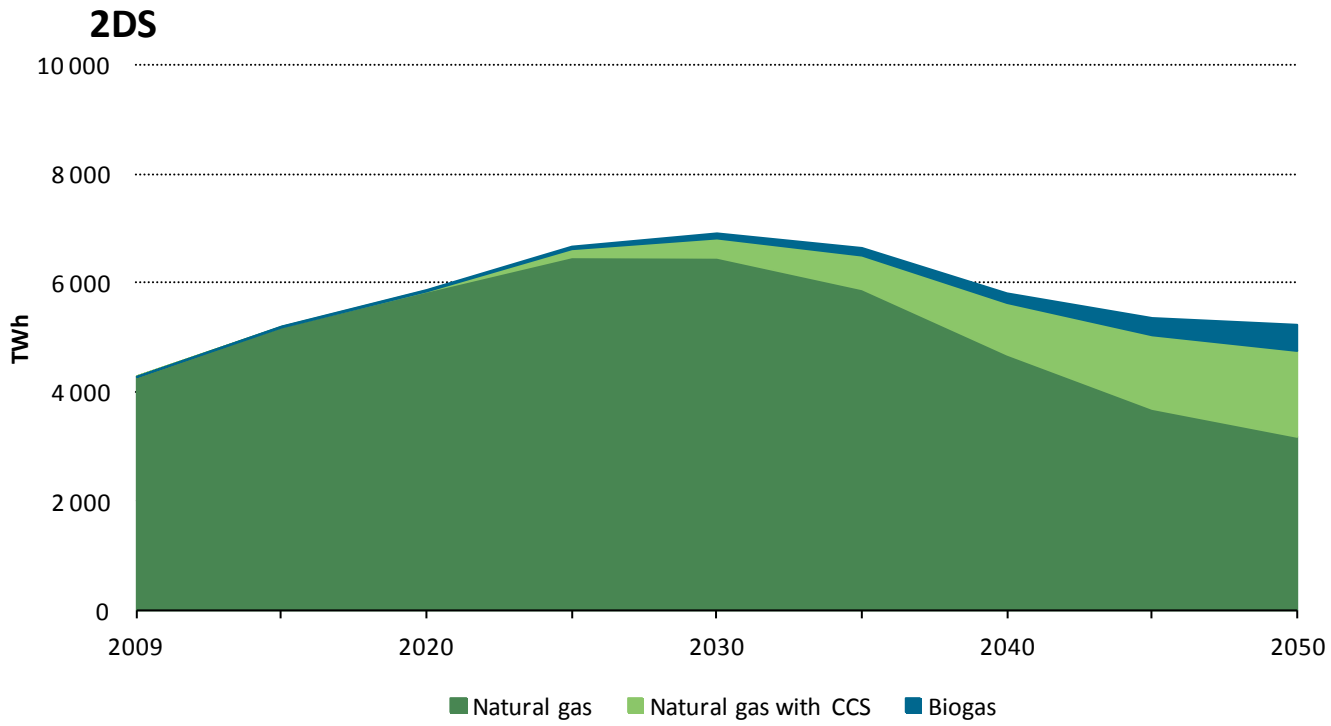
Notes: Natural gas-fired power generation includes generation in power plants equipped with CCS units. Biogas is not included here.

Natural gas a 'high-carbon fuel' after 2025



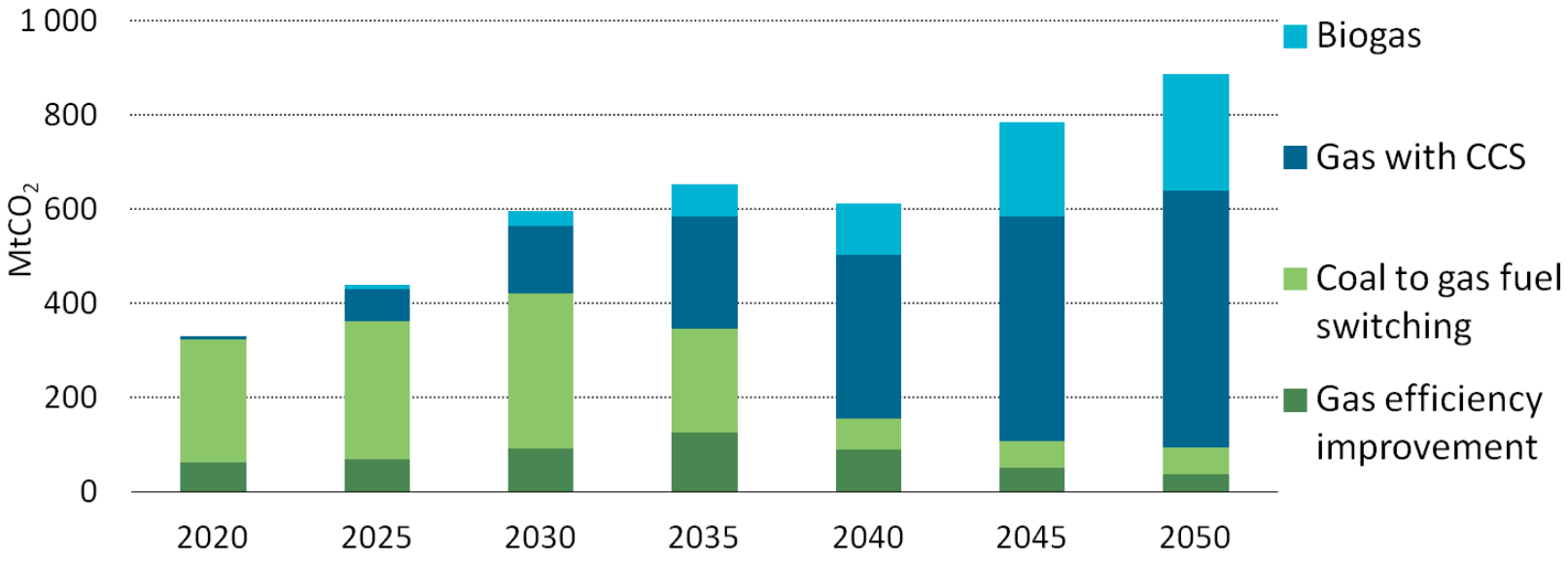
The global average CO2 intensity from natural gas-fired power generation falls below the carbon intensity of CCGTs in 2025.

CCS essential in a low-carbon gas future



In the 2DS, 40% of the electricity generated from gas comes from natural gas with CCS and biogas.

In the gas transition, energy efficiency and CCS all contribute to achieving the 2DS



Continuous technology improvement will be necessary to achieve efficiency increases and to reduce the cost of CCS.

Gas: Conclusions

- We are now entering the Golden Age of Gas
- Gas is part of the solution to climate change in the energy sector

  in particular in the short-to-medium term
- In the longer term though, over-reliance on gas can become part of the problem (keys include CCS)

Overall Conclusions

- Energy efficiency & natural gas are two key aspects of achieving a 2 Degree Scenario while supporting economic growth

- Other parts of the puzzle, e.g.:
  - massive deployment of renewable energy technologies
  - CCS

Overall Conclusions

- **Energy/Climate dynamics pose challenges:**
  - **Avoid lock-in of high-carbon technologies (time to begin to 'un-lock'?)**
  - **Motivate despite "difficult to discern" impacts of climate change (act now for our future)**
  - **Strengthen the resilience of our energy systems to climate**
  - **Stimulate /support the political commitment needed to fuel dramatic changes**

Overall Conclusions

The IEA is committed to working with others to address the climate challenge and thereby enhance sustainable global energy security

Related IEA Publications

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