

# WORLD ENERGY OUTLOOK

## *Energy Challenges of Our Time*

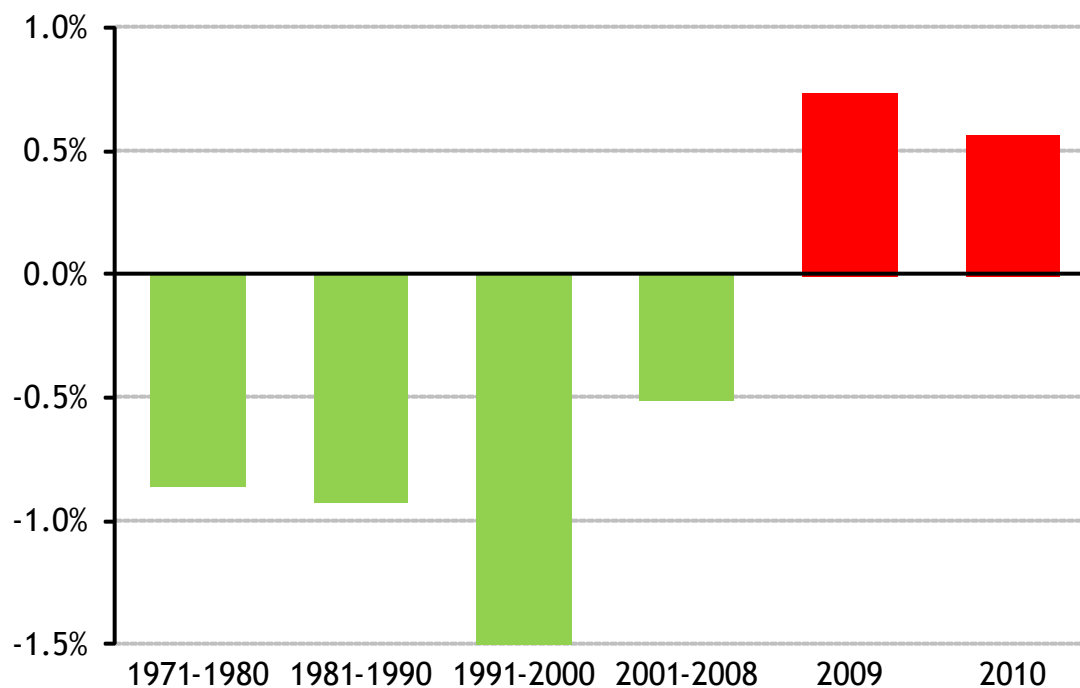
**Dr. Fatih BIROL**  
**IEA Chief Economist**

# *The context: fresh challenges add to already worrying trends*

- **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**
- **CO<sub>2</sub> emissions rebounded to a record high**

# *Energy efficiency is crucial for energy security and climate change*

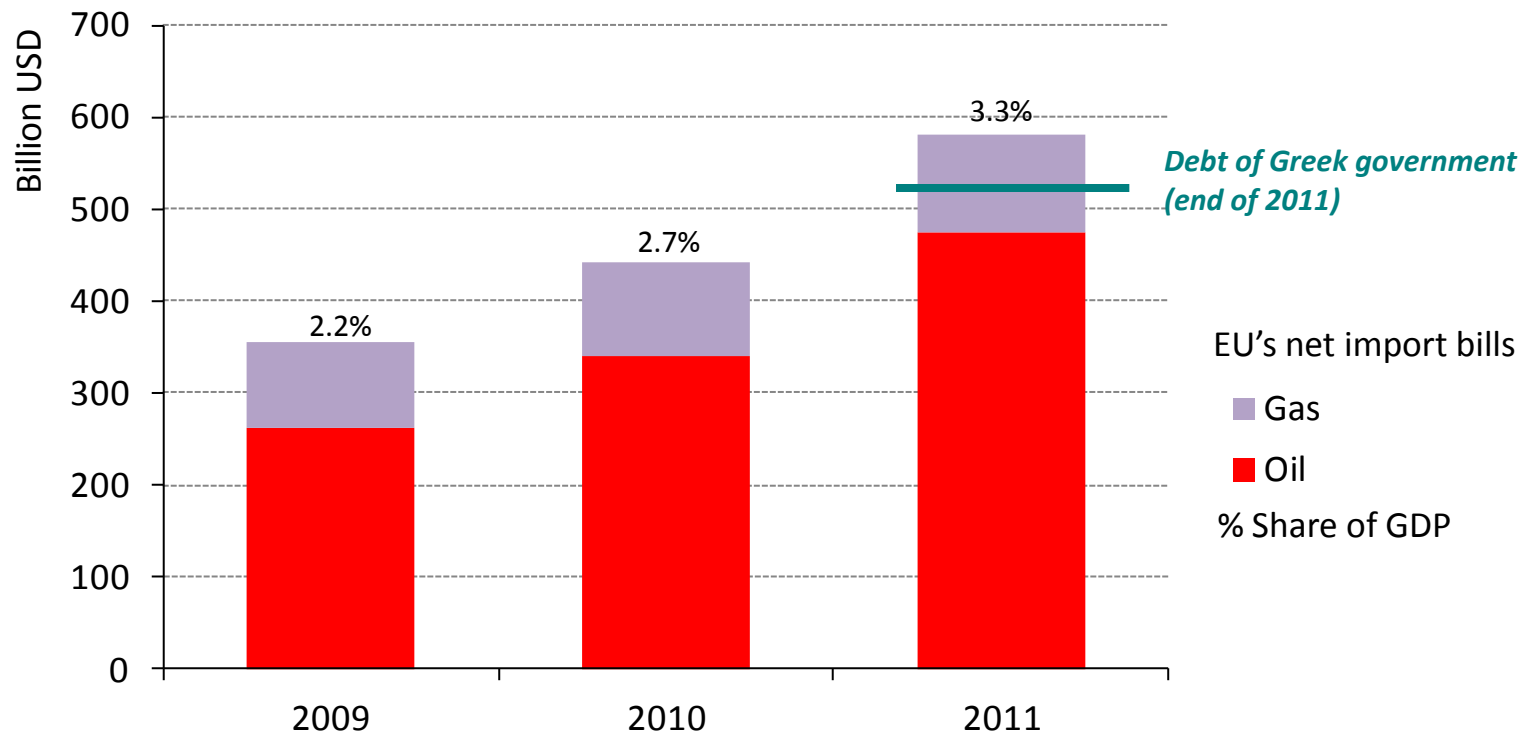
**Annual change in global energy intensity for selected periods**



***Global energy efficiency development is going in the wrong direction***

# Europe: rising energy prices compound the pain of austerity

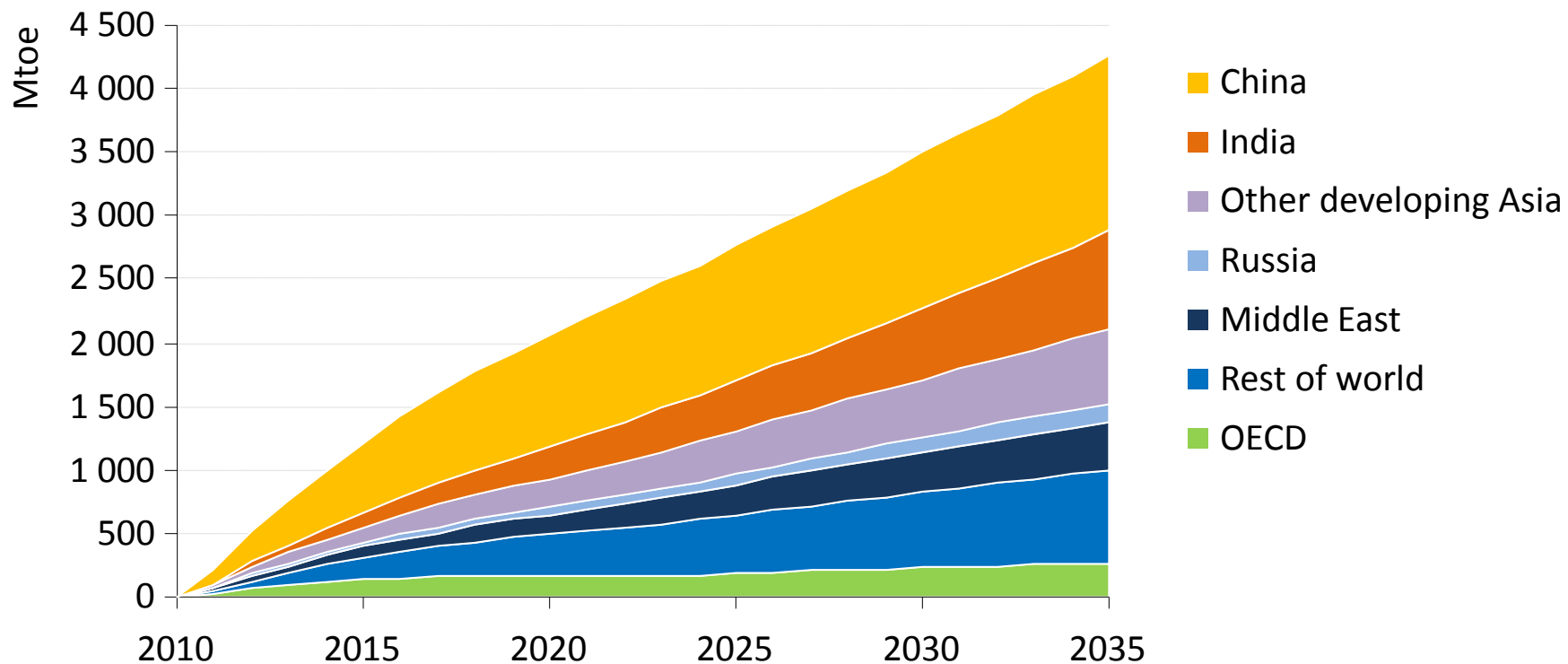
### Cost of net imports of oil and gas in the European Union



**EU spending on imports was almost two-thirds higher in 2011 than 2009 as a result of higher international oil prices & oil-indexed gas prices**

# Emerging economies continue to drive global energy demand

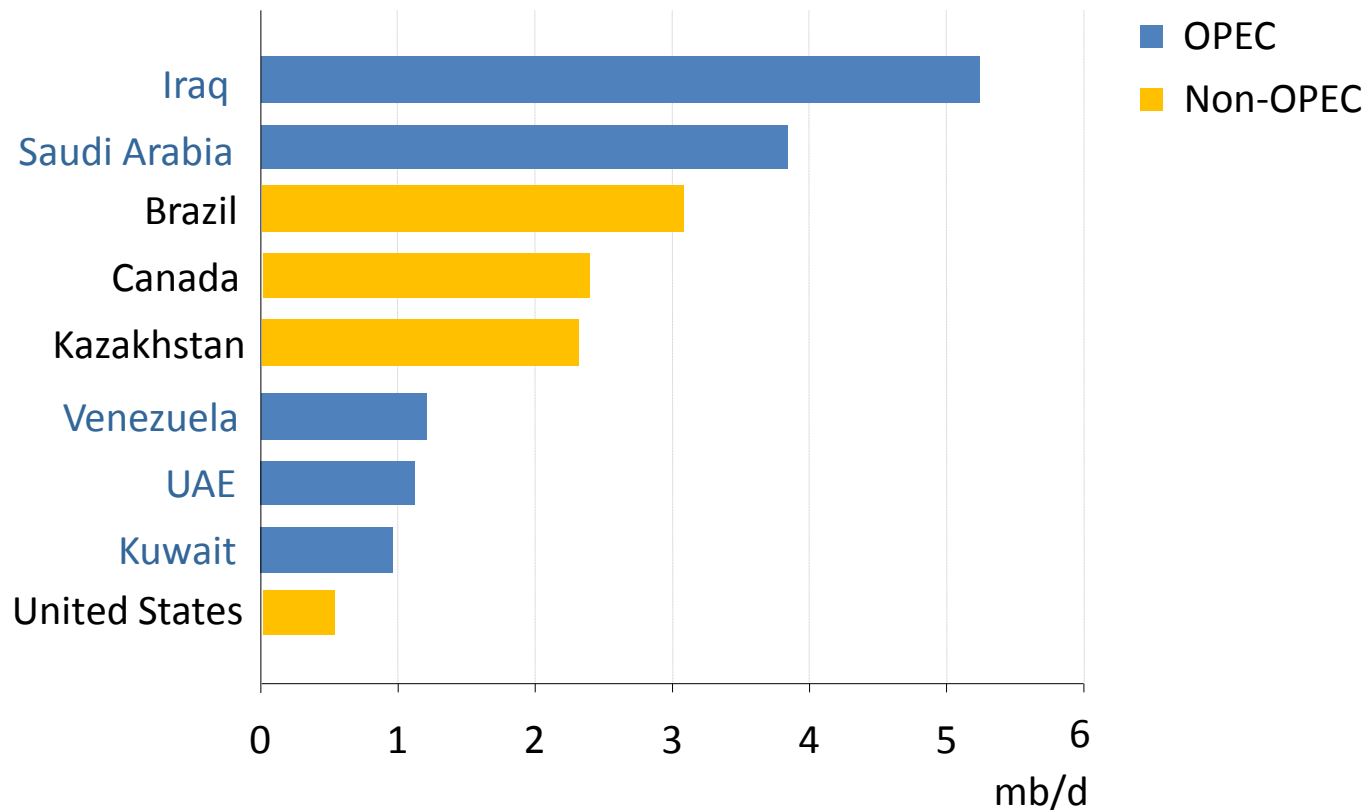
### Growth in primary energy demand



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

# Iraq is the largest source of oil supply growth

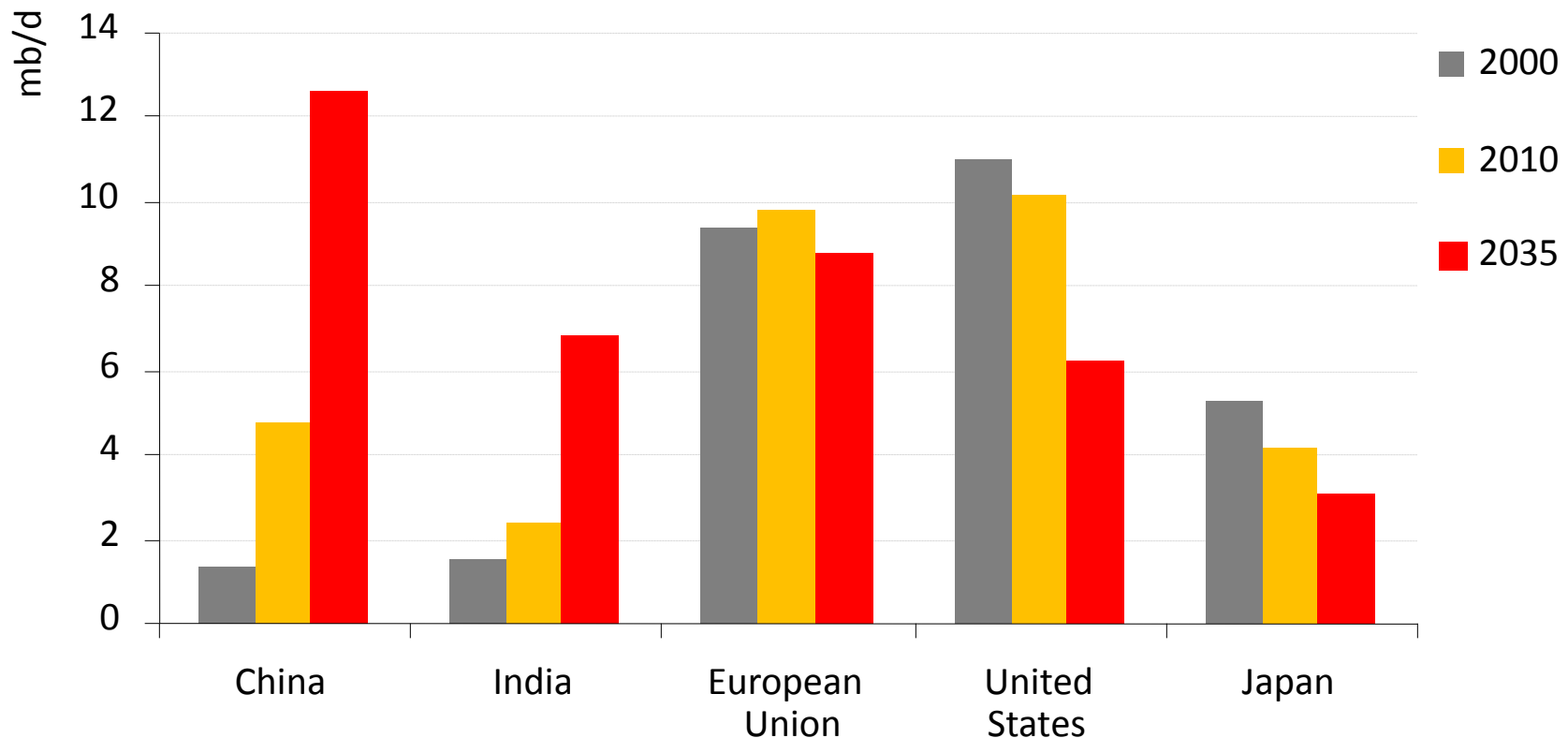
### Major changes in world liquids supply in the New Policies Scenario, 2010-2035



***The rise in MENA production is over 90% of the growth in global oil output to 2035 while companies operating elsewhere turn increasingly to more difficult & costly sources***

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

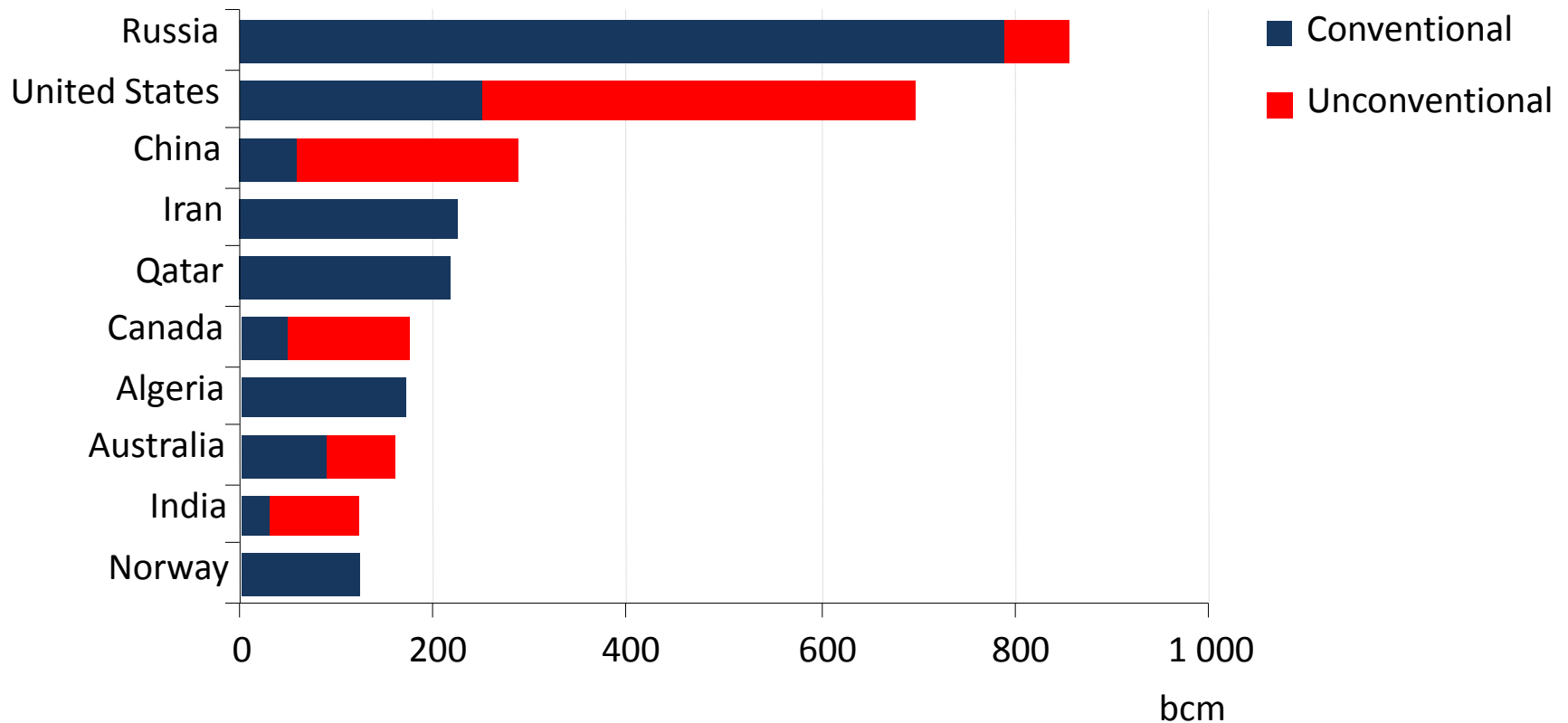
Net imports of oil



**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**

# Golden prospects for natural gas

## Largest natural gas producers in 2035

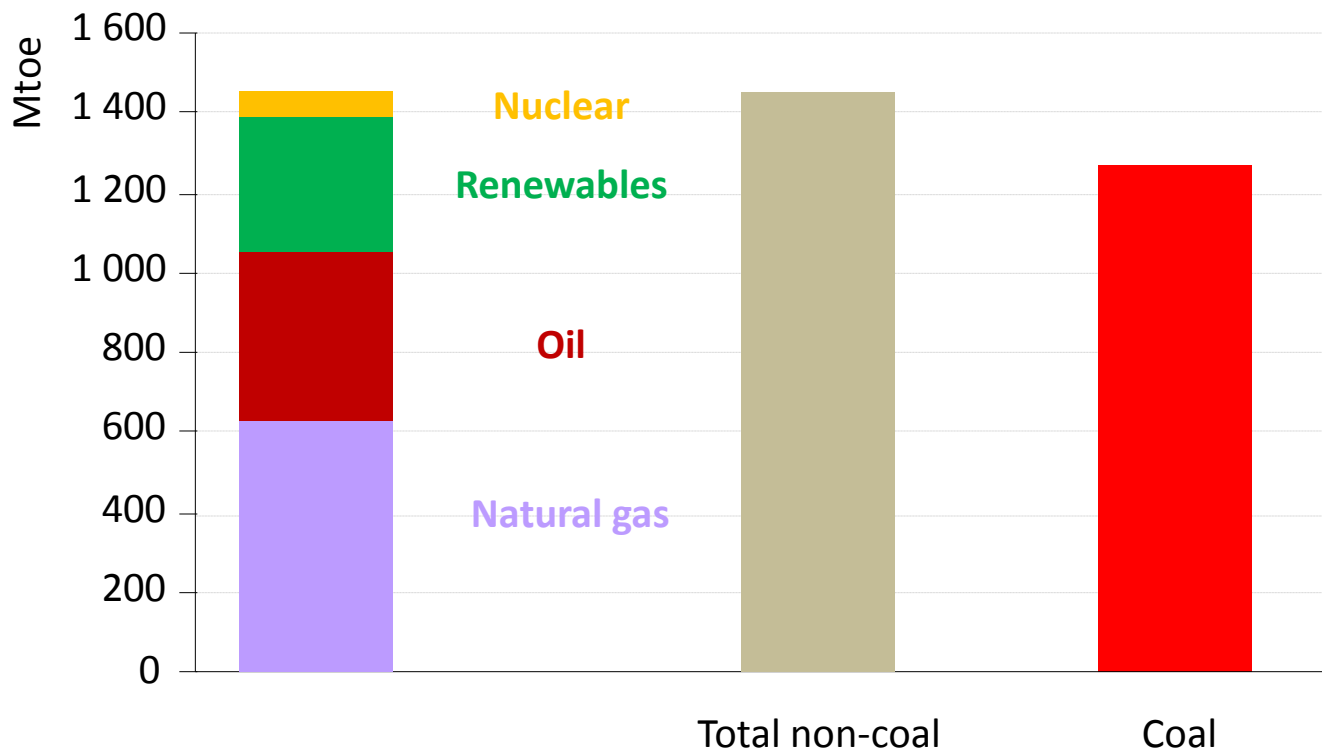


***Unconventional natural gas supplies 40% of the 1.7 tcm increase in global supply, but best practices are essential to successfully address environmental challenges***



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

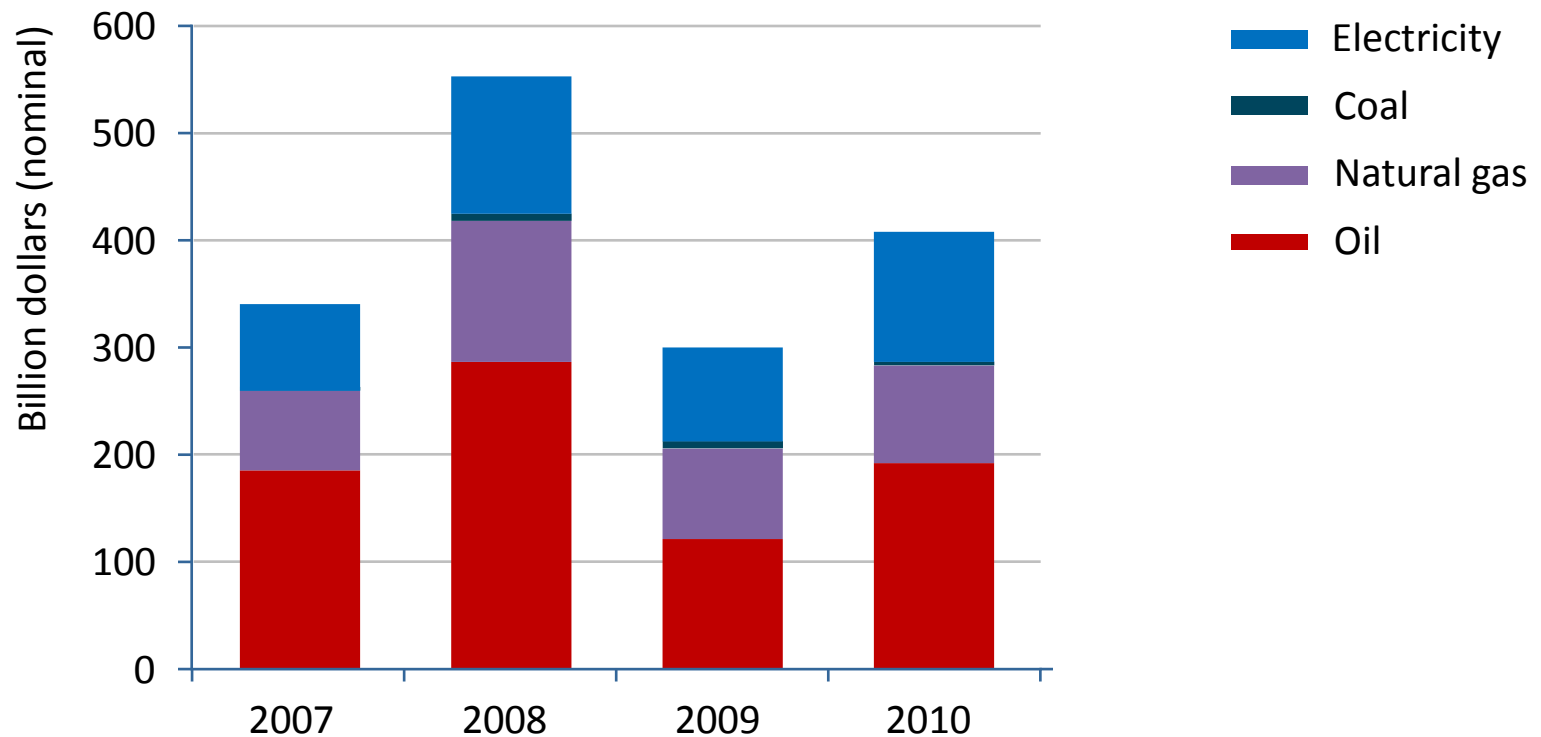
Growth in global energy demand, 2000-2010



**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**

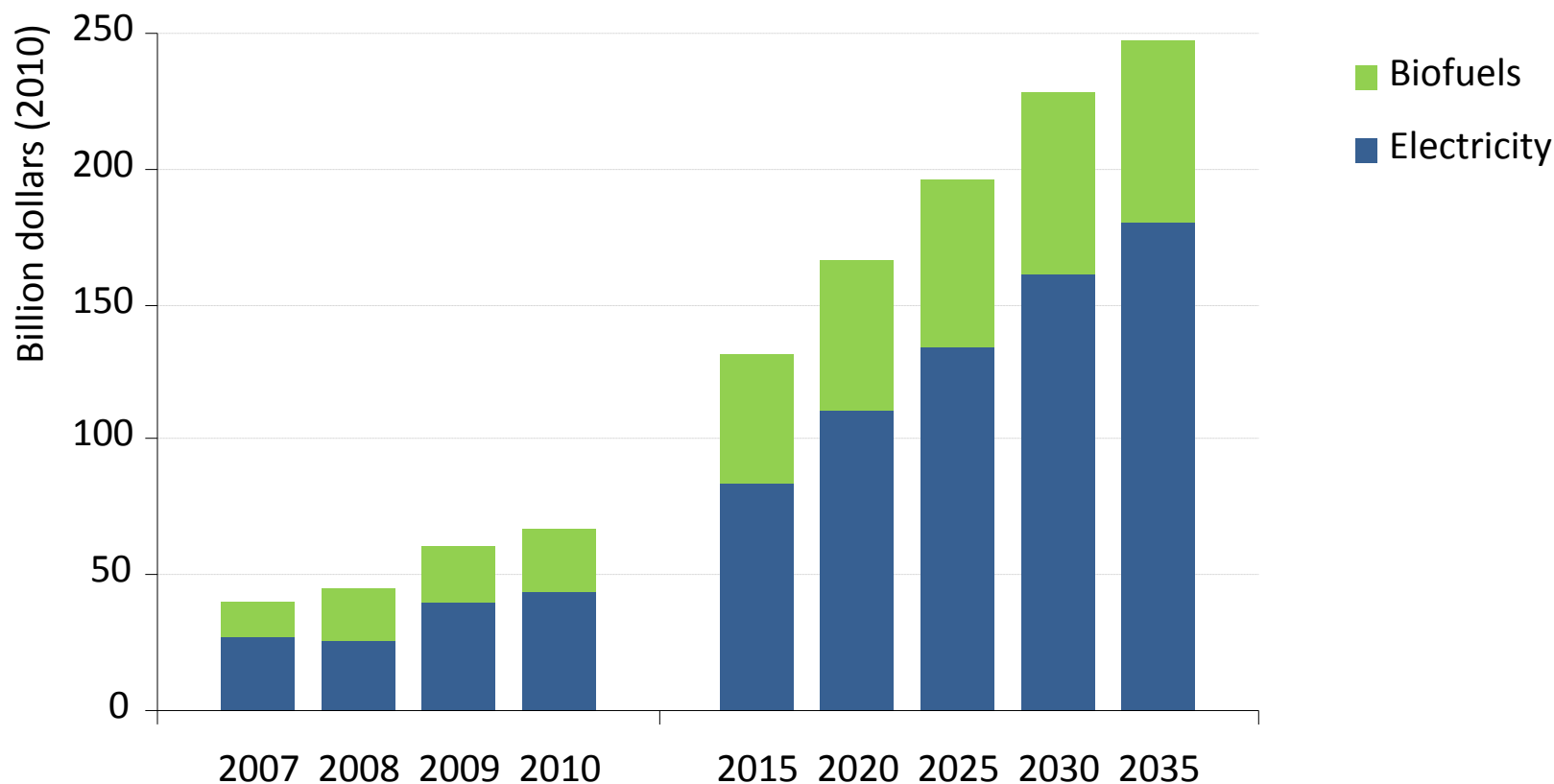
# Fossil-fuel subsidies remain costly

## Global economic cost of fossil-fuel consumption subsidies



***Fossil-fuels subsidies amounted to \$409 billion in 2010 – with negative consequences on energy efficiency, environment and penetration of renewable energy.***

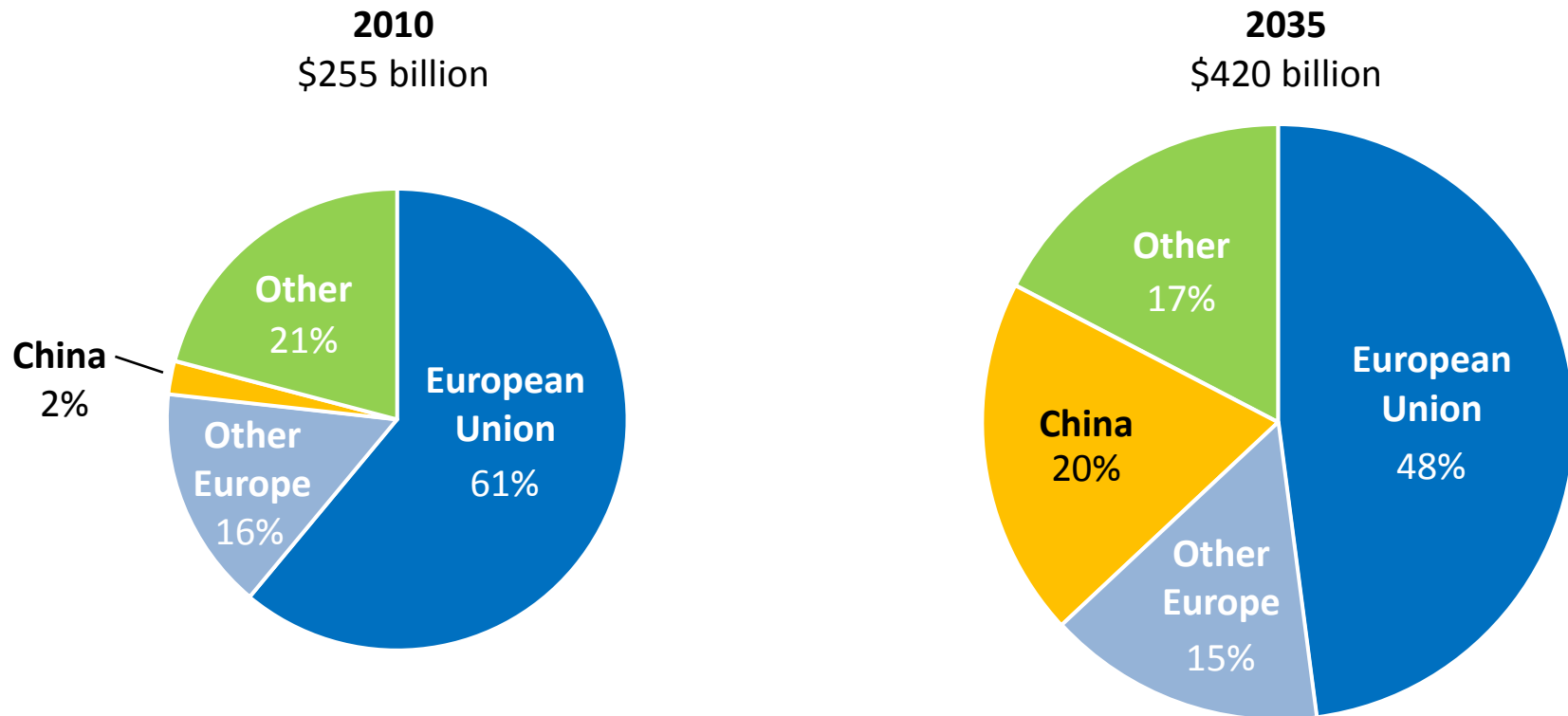
# The overall value of subsidies to renewables is set to rise



**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**

# Russia remains a cornerstone of the global energy economy

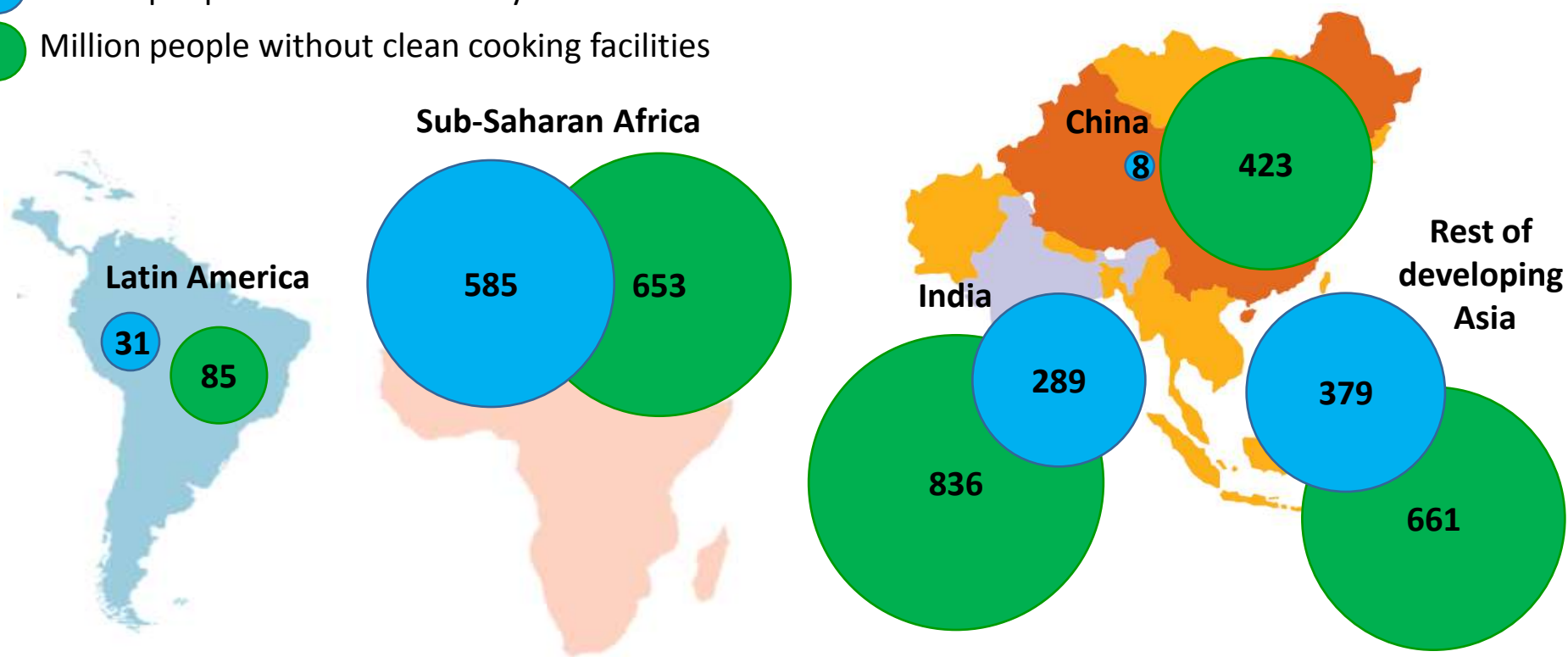
### Russian revenue from fossil fuel exports



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

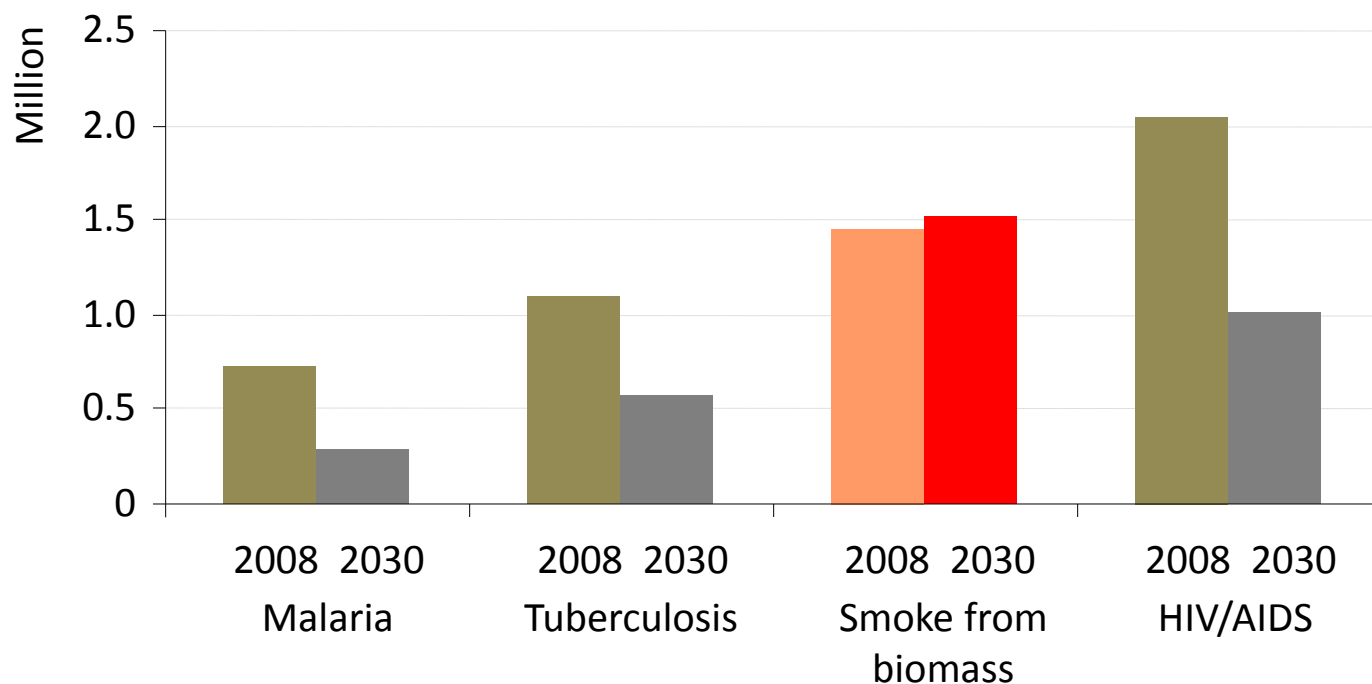
# Energy poverty is widespread

- Million people without electricity
- Million people without clean cooking facilities



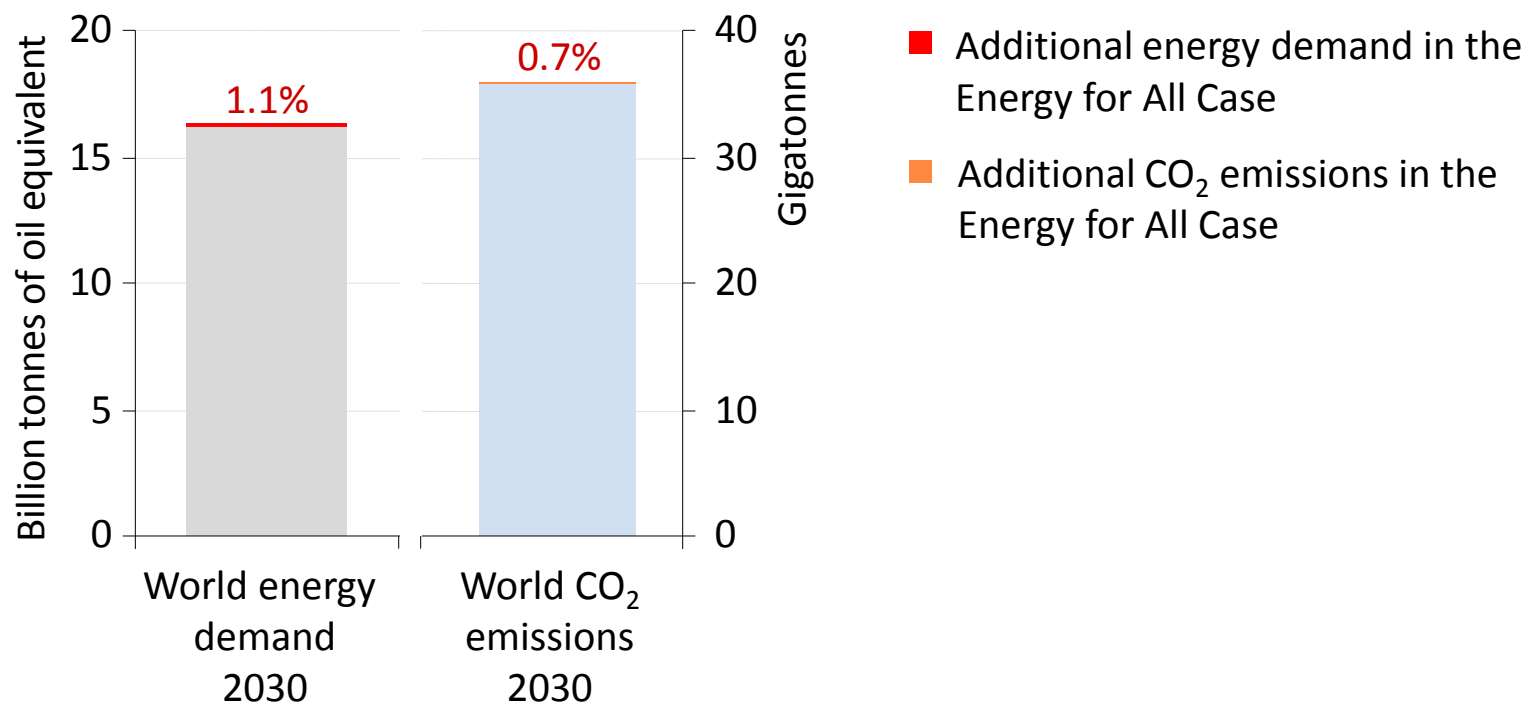
**1.3 billion people in the world live without electricity  
and 2.7 billion live without clean cooking facilities**

### Premature annual deaths from household air pollution and selected diseases



***Clean cooking facilities would prevent the majority of deaths attributable to indoor air pollution from burning biomass***

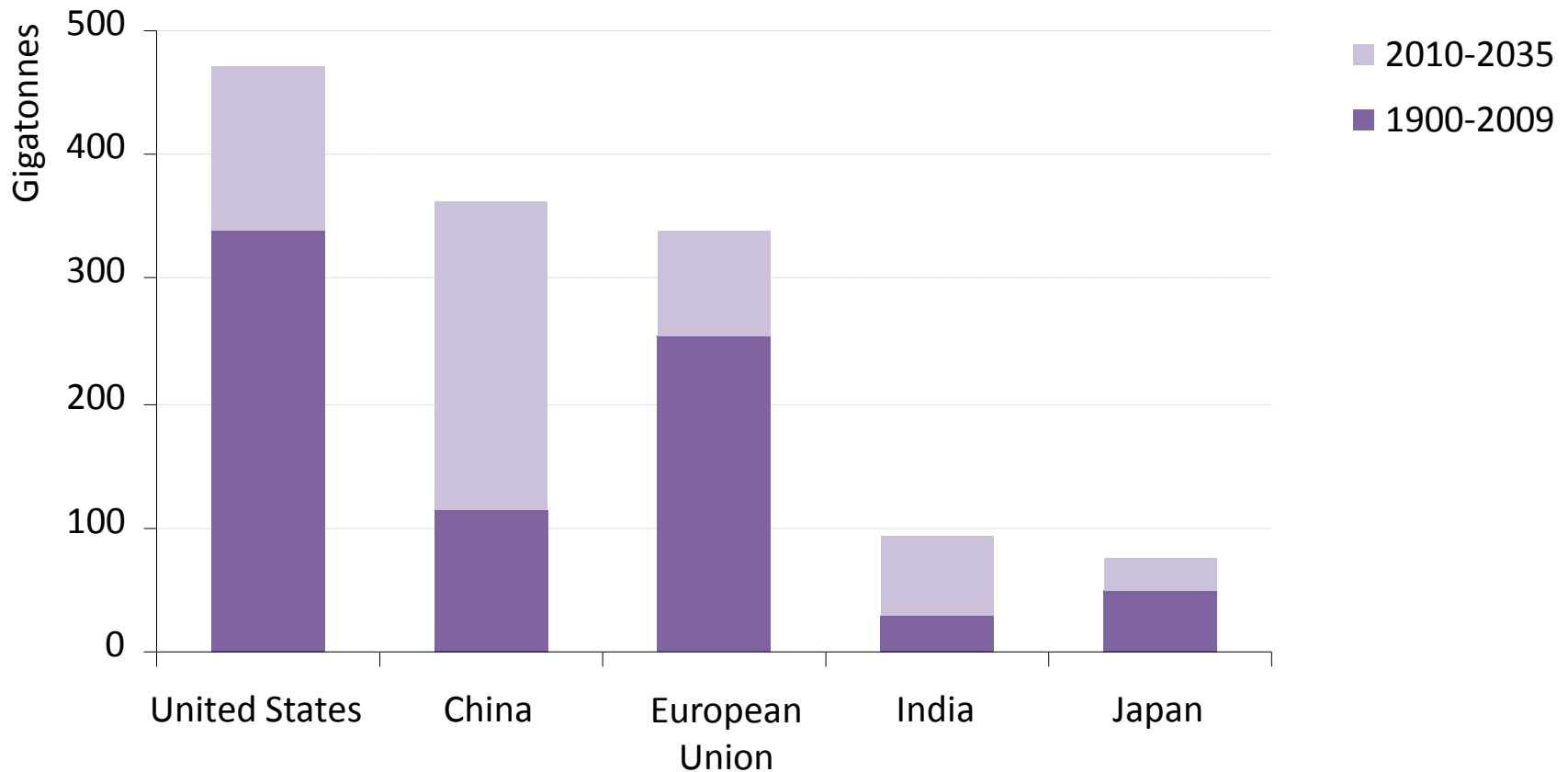
# Implications of modern energy for all



***Achieving modern energy for all would only have a negligible impact on energy security and climate change***

# Energy is at the heart of the climate challenge

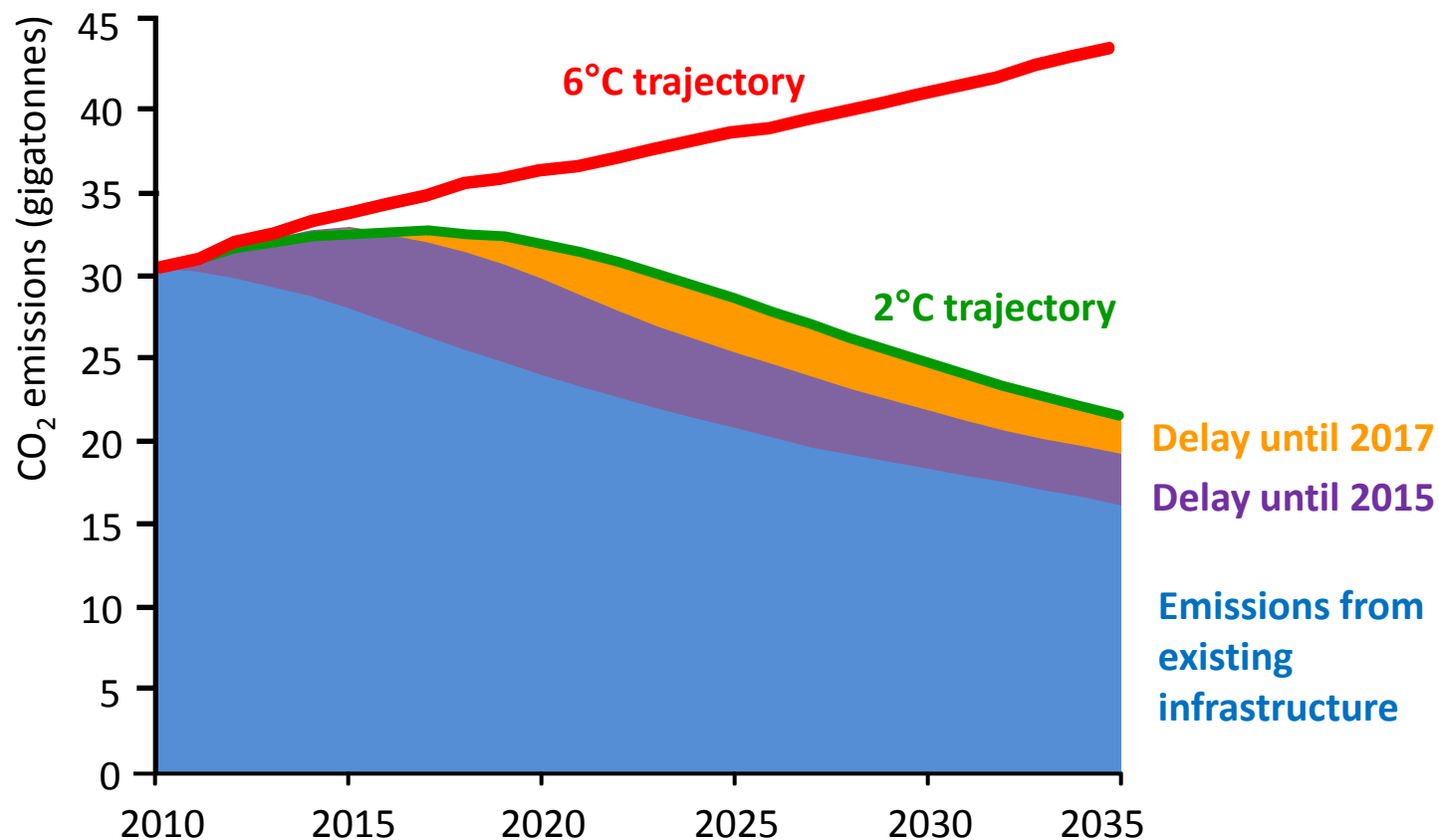
### Cumulative energy-related CO<sub>2</sub> emissions in selected regions



**By 2035, cumulative CO<sub>2</sub> emissions from today exceed three-quarters of the total since 1900, and China's per-capita emissions match the OECD average**



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



**Without further action, by 2017 all CO<sub>2</sub> emissions permitted in the 450 Scenario will be “locked-in” by existing power plants, factories, buildings, etc**

- In Durban all countries agreed to implement a new framework to reduce global greenhouse gas emissions
- A protocol has to be agreed by 2015 and enacted by 2020 – the timeframe increases dangerously the risk of a lock-in into a high carbon infrastructure
- By 2017 only 15% of global emissions will be covered by a carbon price
- Energy investments have not become less carbon-intensive since Durban
- Urgent need for bold political action