

The global energy outlook and what it means for Japan



Paul Simons

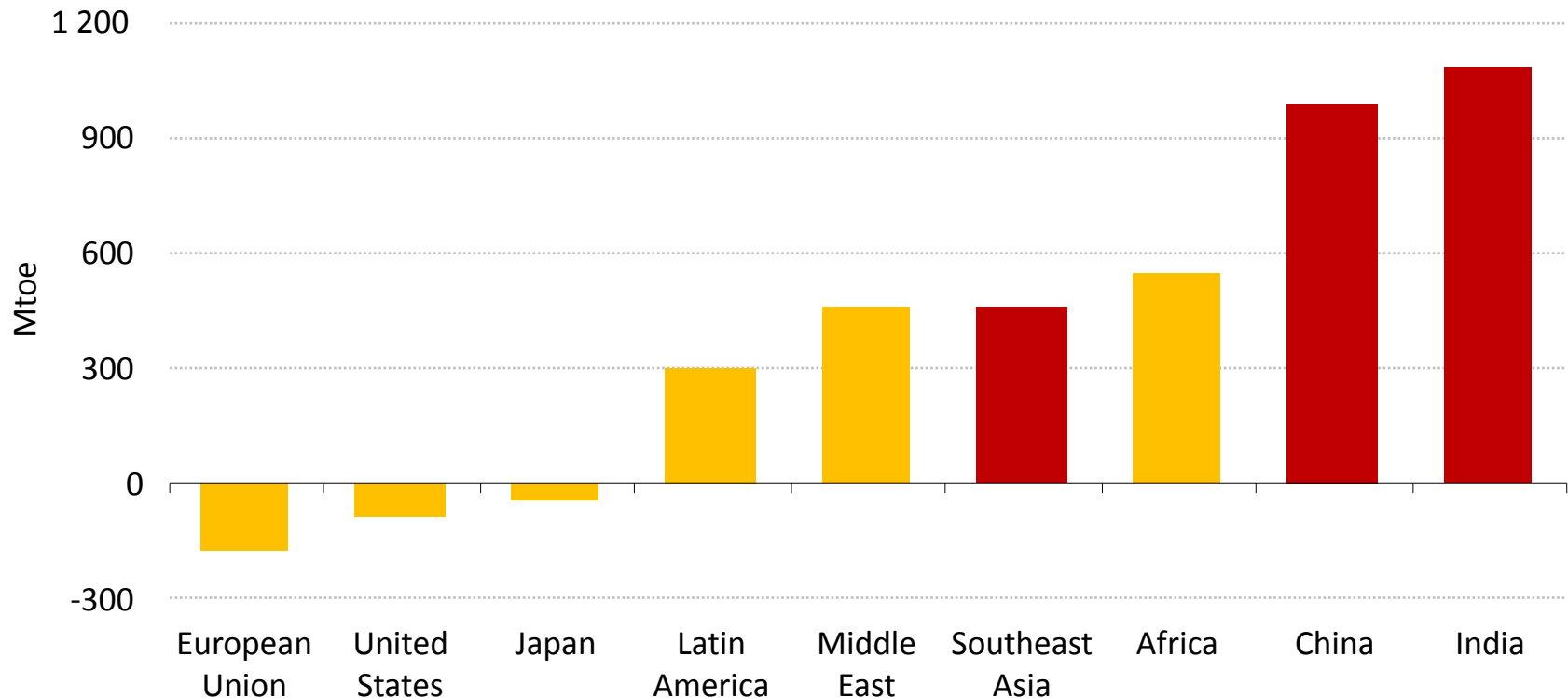
Deputy Executive Director, International Energy Agency

Japan IDR launch

Tokyo, 21 September 2016

Long-term energy demand set to grow fast in Asia

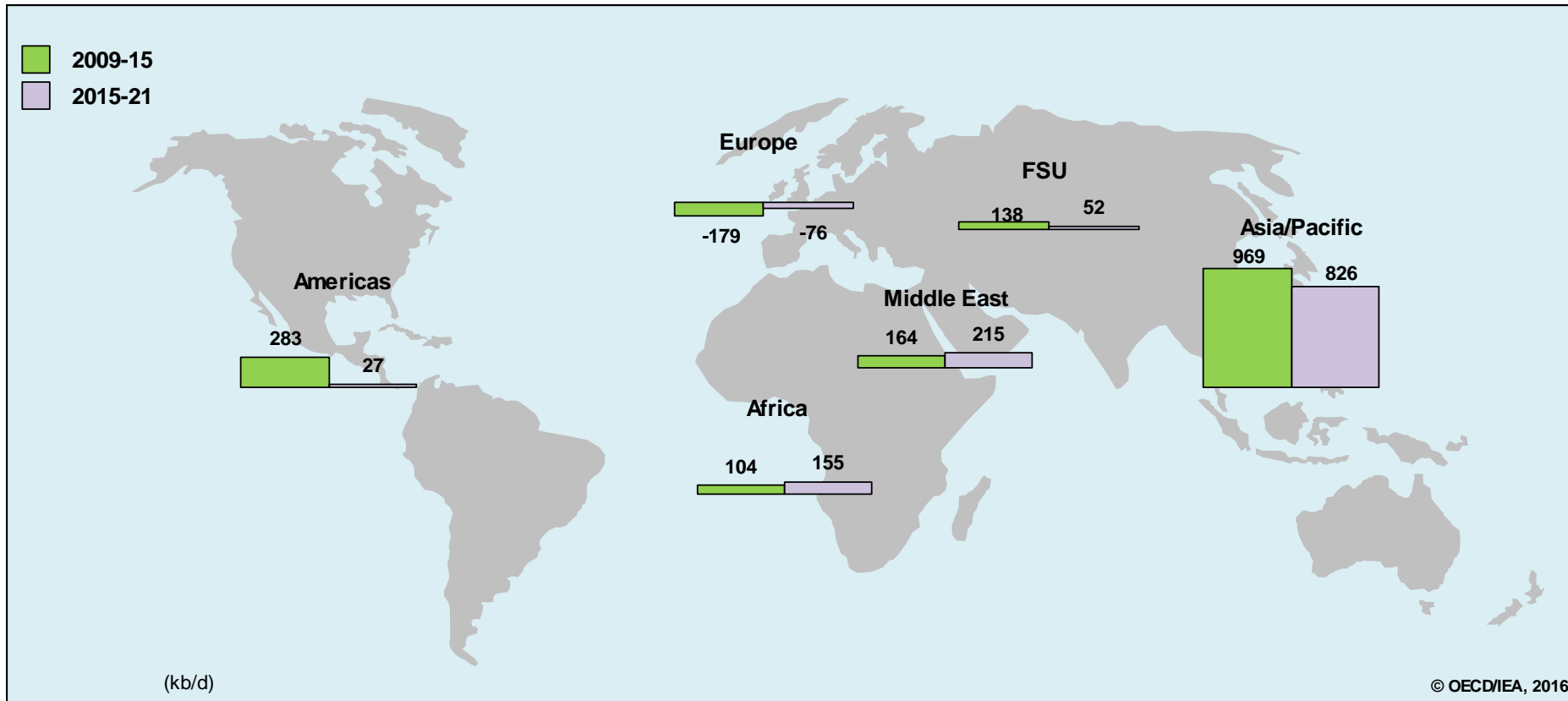
Change in energy demand in selected regions, 2014-2040



Energy use worldwide grows by one-third to 2040, driven by Asia.

Global oil demand set to grow slower in the medium term

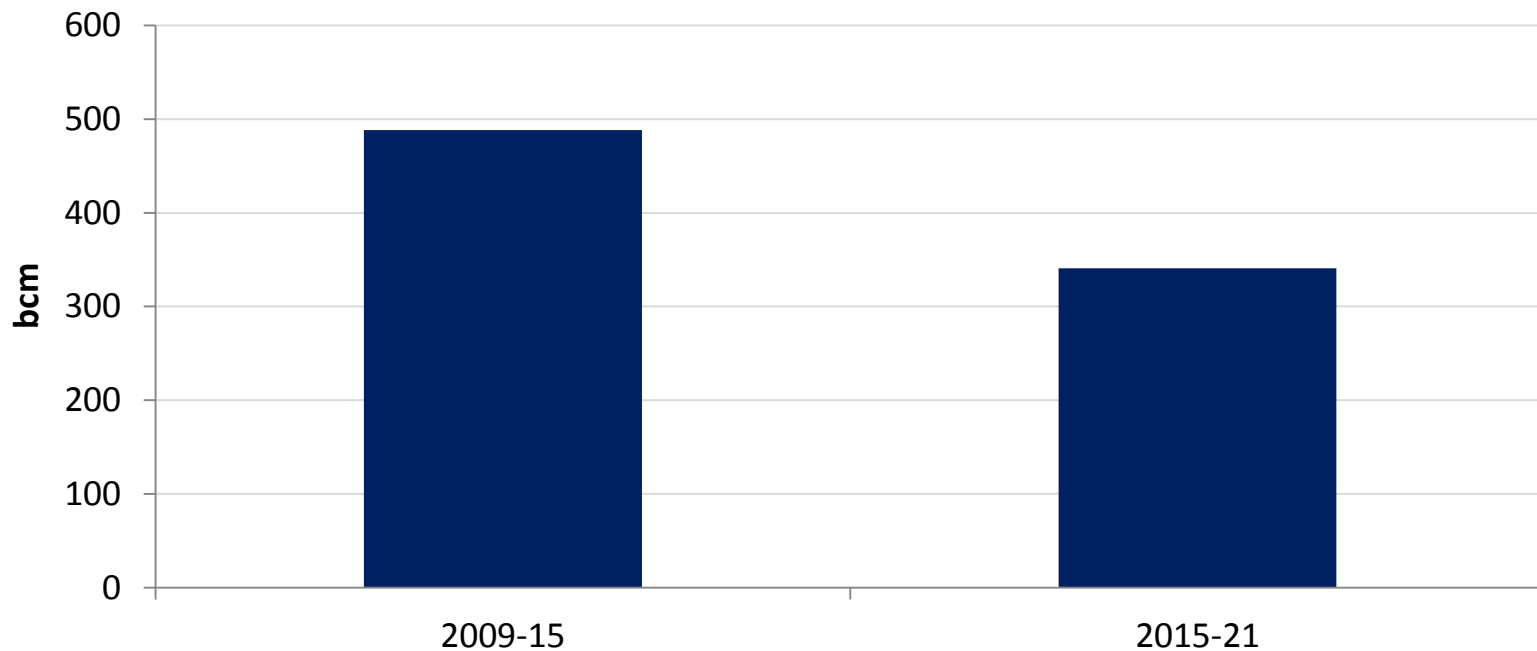
Oil demand growth projections by region



***+1.2% 2016-21 versus 1.7% in previous 5-year period,
as efficiency gains trim momentum***

Also natural gas demand growth slows

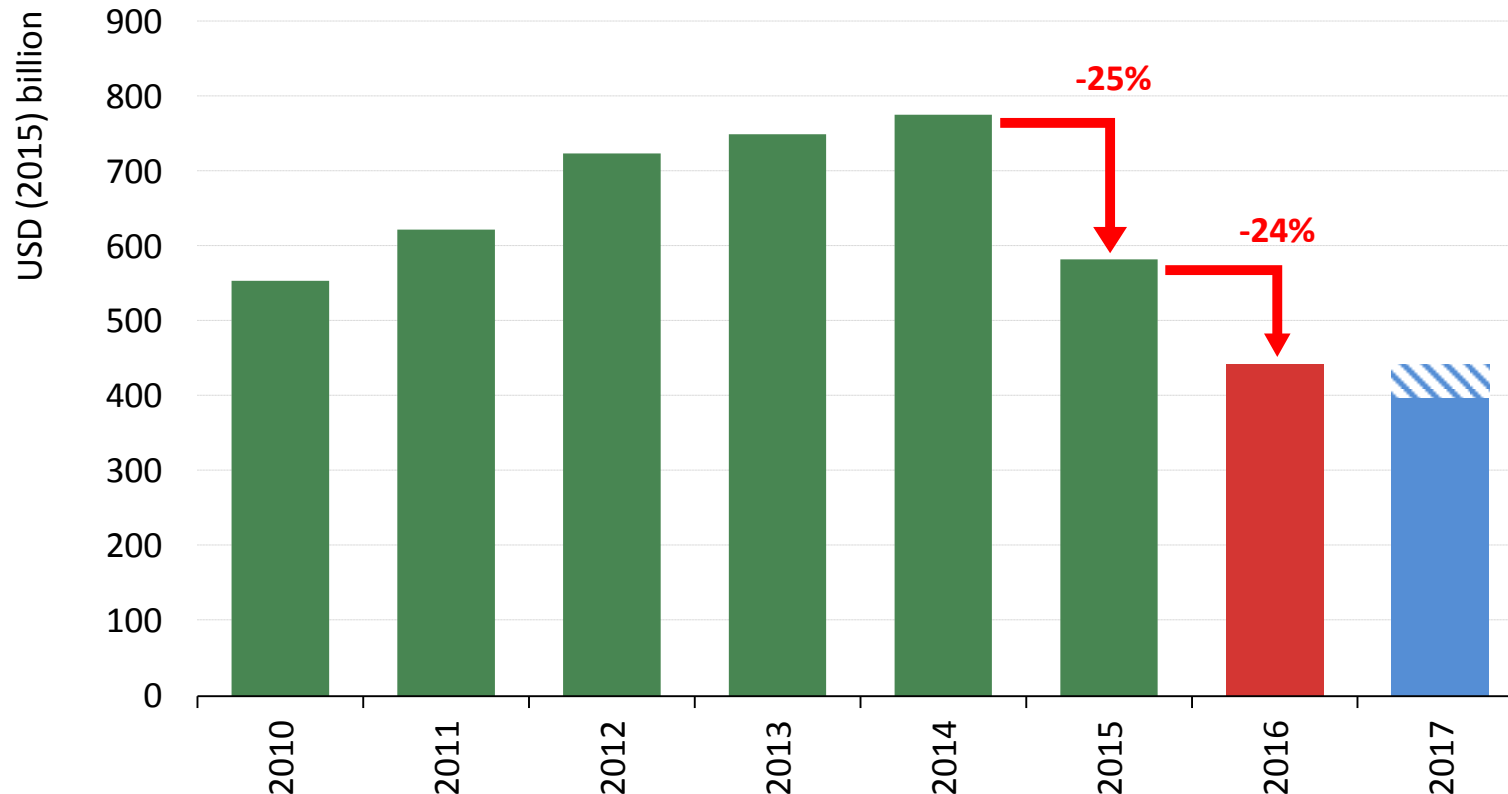
Change in global natural gas demand



Gas faces greater competition in the power sector; yet it is the only fossil fuel that does not suffer a decline in its share of the energy mix.

Unprecedented wave of investment cuts in the upstream oil and gas industry

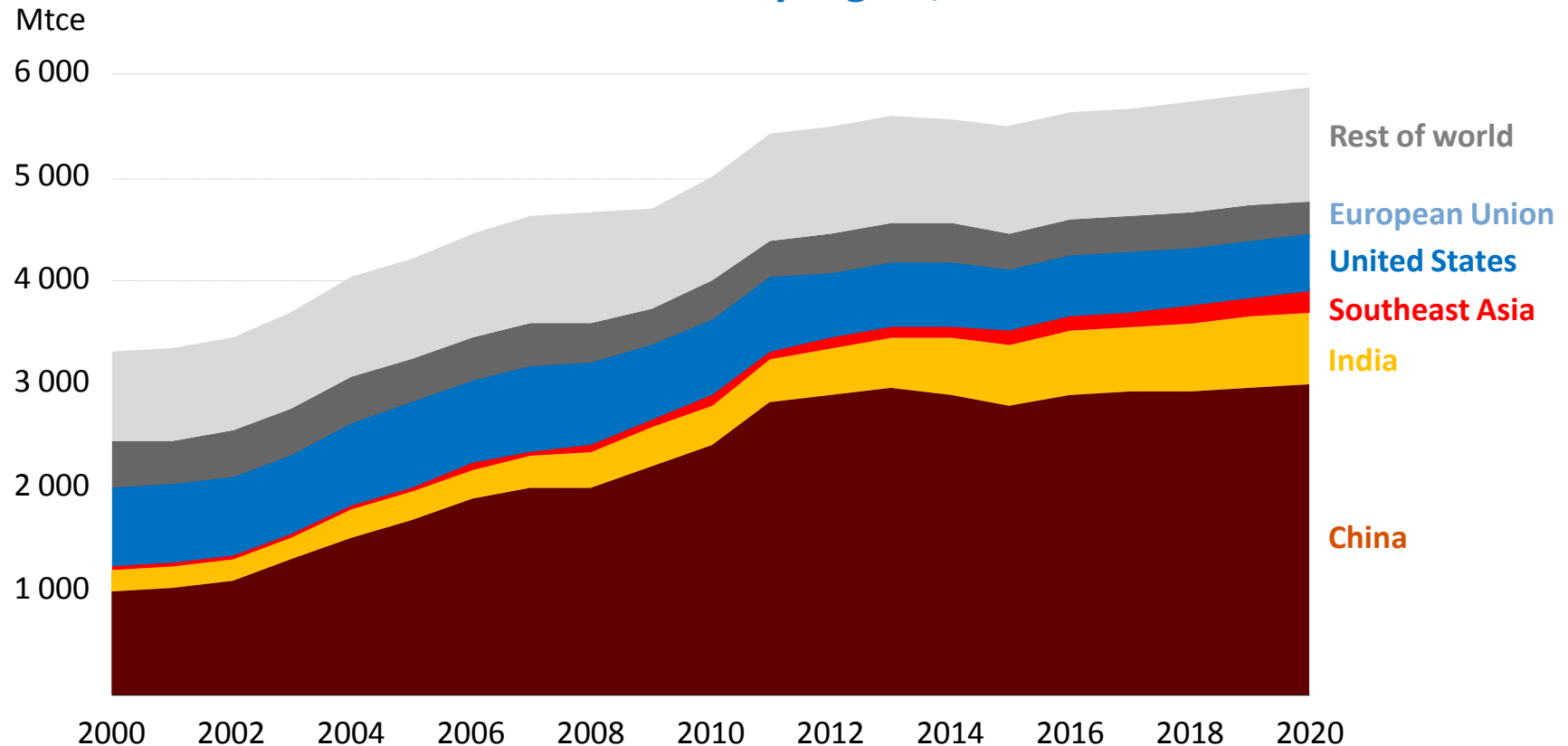
Global upstream capital spending 2010-2017



Cost deflation, efficiency improvements and reduced activity levels might lead for the first time to three consecutive years of investment decline

There is no “second” China waiting to drive medium-term coal use

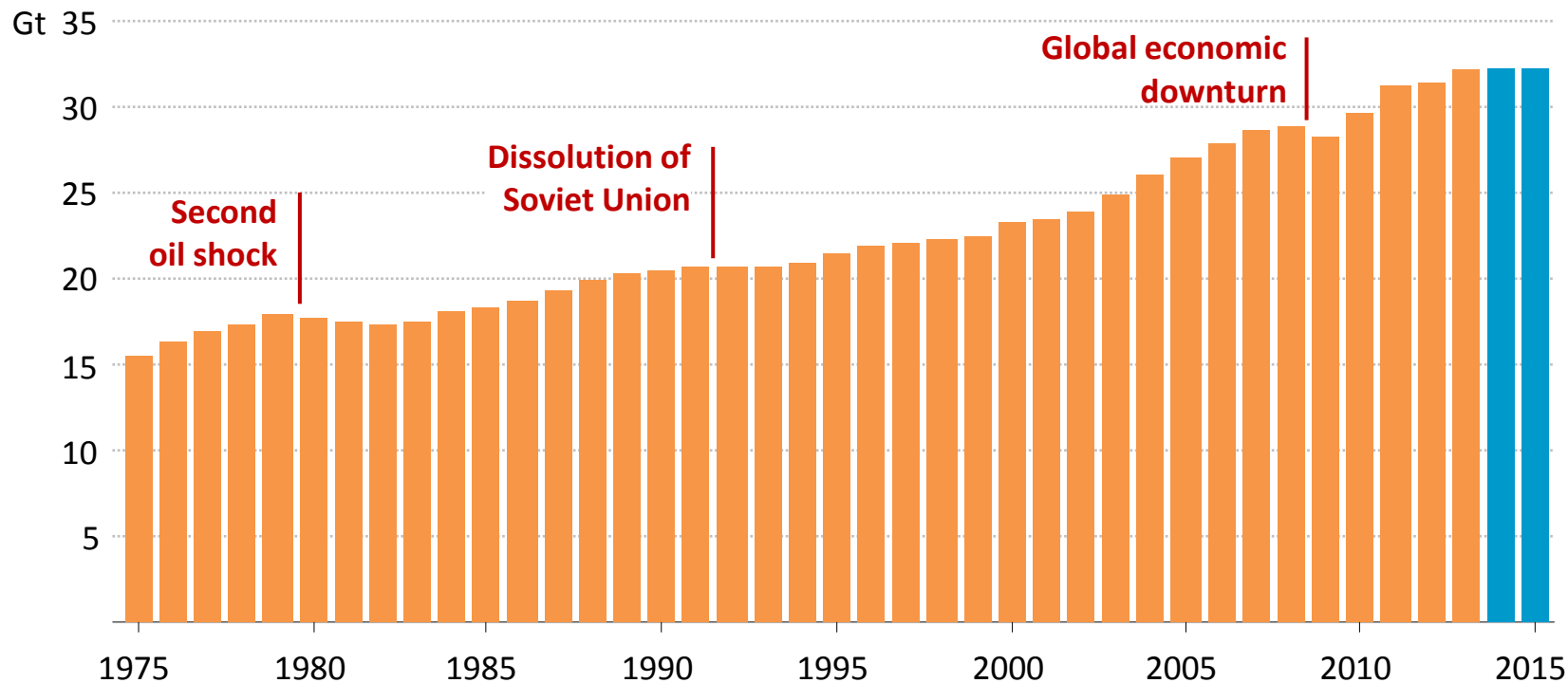
Global coal demand by region, 2000-2020



Strong growth in coal use in India & Southeast Asia to offset declines in the EU & the US, but does not match the rise seen over last decade in China.

Slowing fossil fuels demand growth – have energy-related CO₂ emissions peaked?

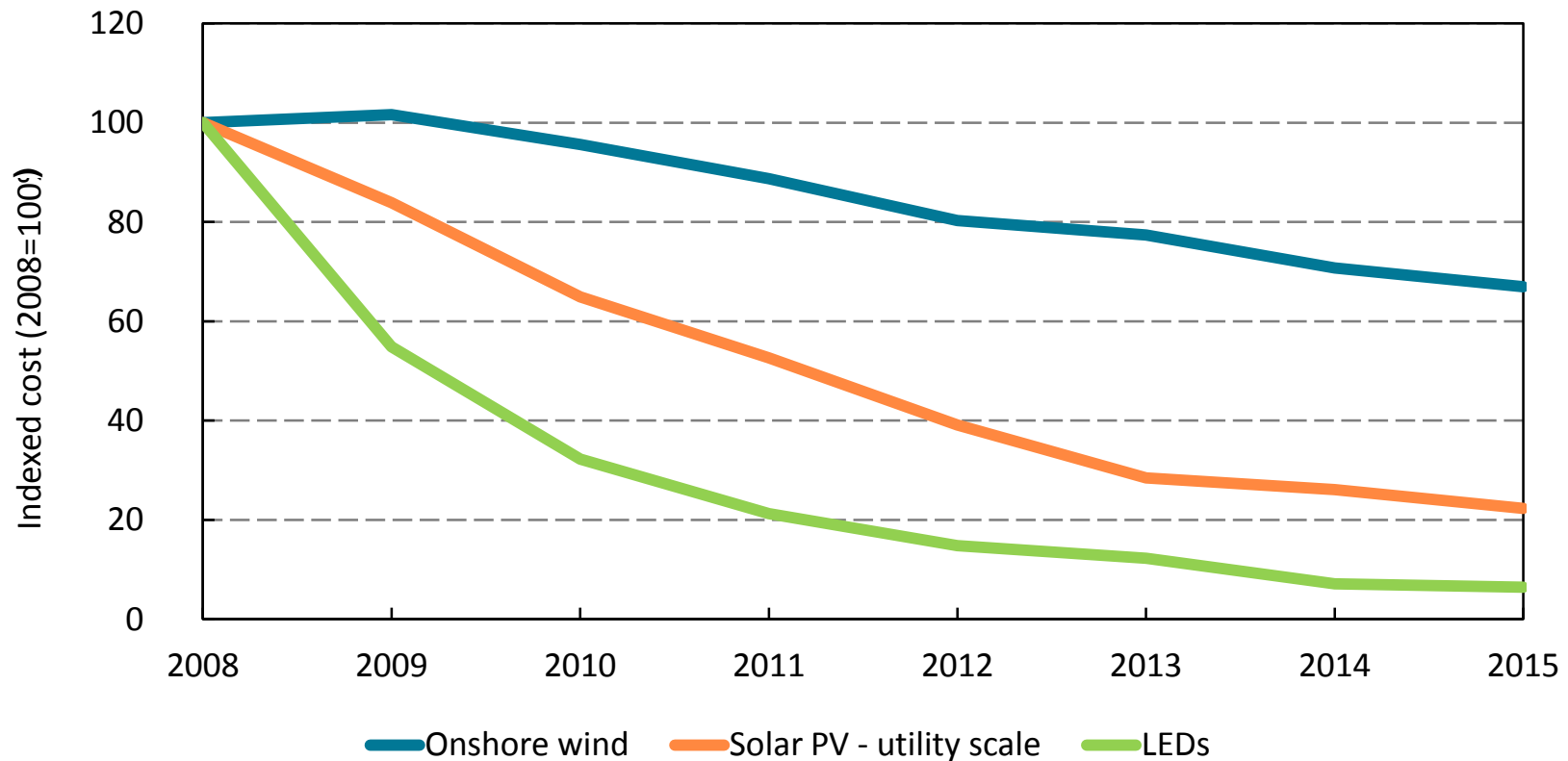
Global energy-related CO₂ emissions



IEA analysis shows renewables, led by wind, and improvements in energy efficiency were key to keeping emissions flat for a second year in a row.

The cost of clean energy continues to fall

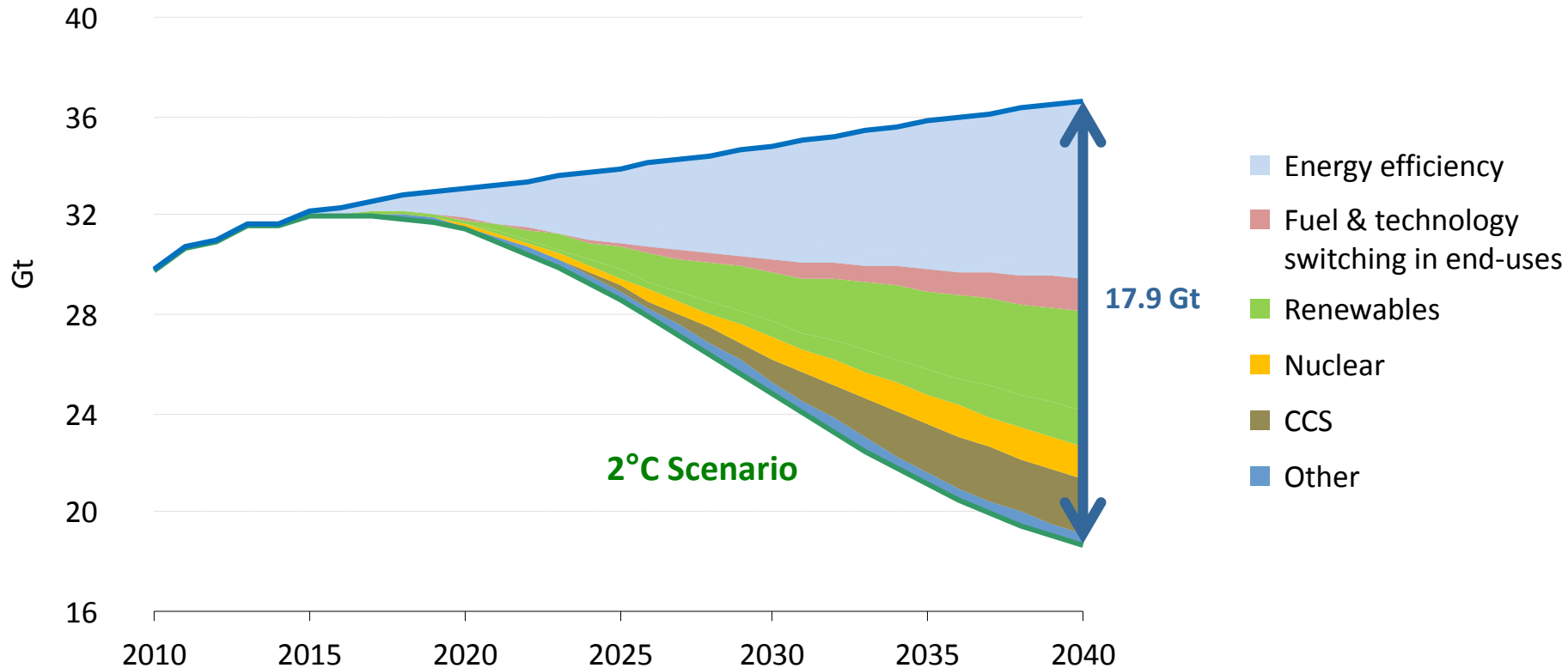
Indexed cost of onshore wind, utility scale PV and LED lighting



The falling cost of clean technologies opens new opportunities, but support mechanisms need to be reviewed as costs decline.

Greater efforts are still needed to reach a 2°C pathway

Trend post-COP21



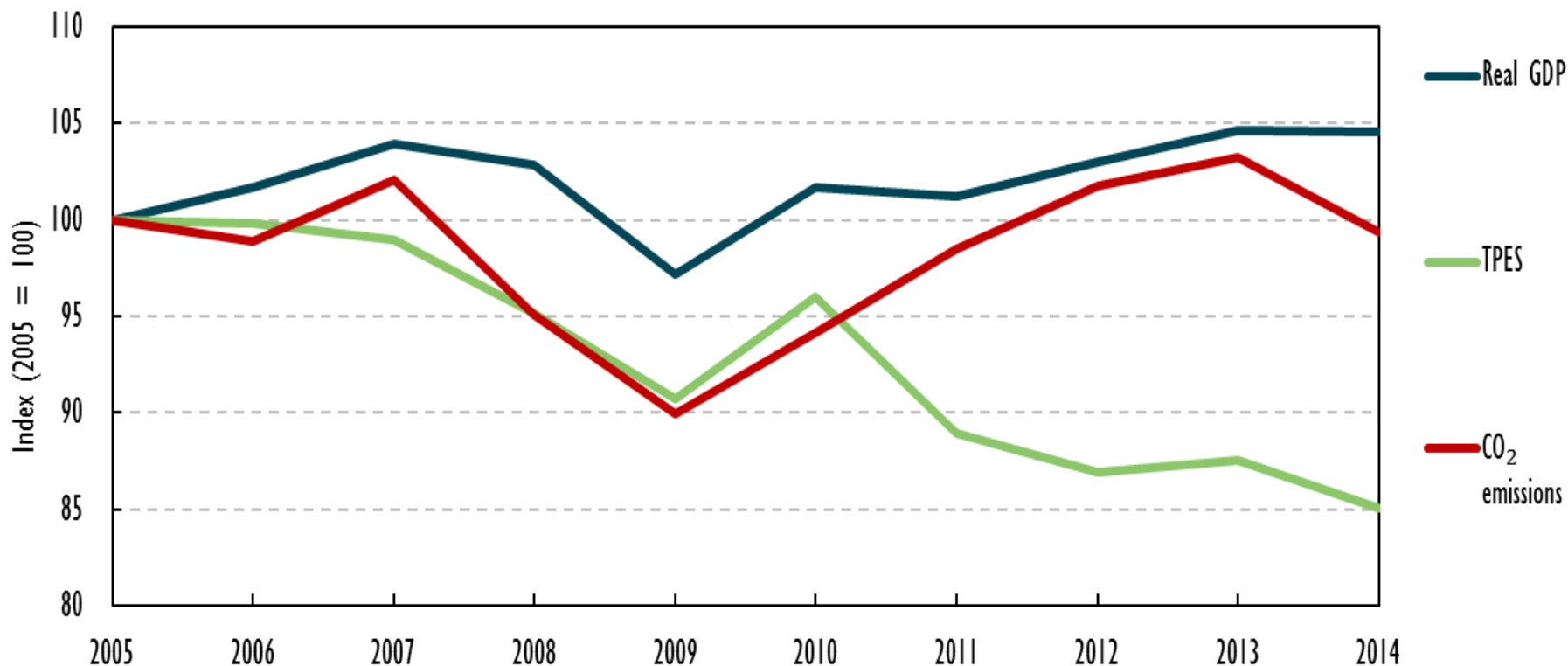
Energy efficiency & renewables will deliver most of the additional emissions reductions required for a 2°C pathway, but all forms of clean technology are needed

Turning to Japan

**From global energy context
to
a focus on Japan's energy policy**

How can Japan contribute?

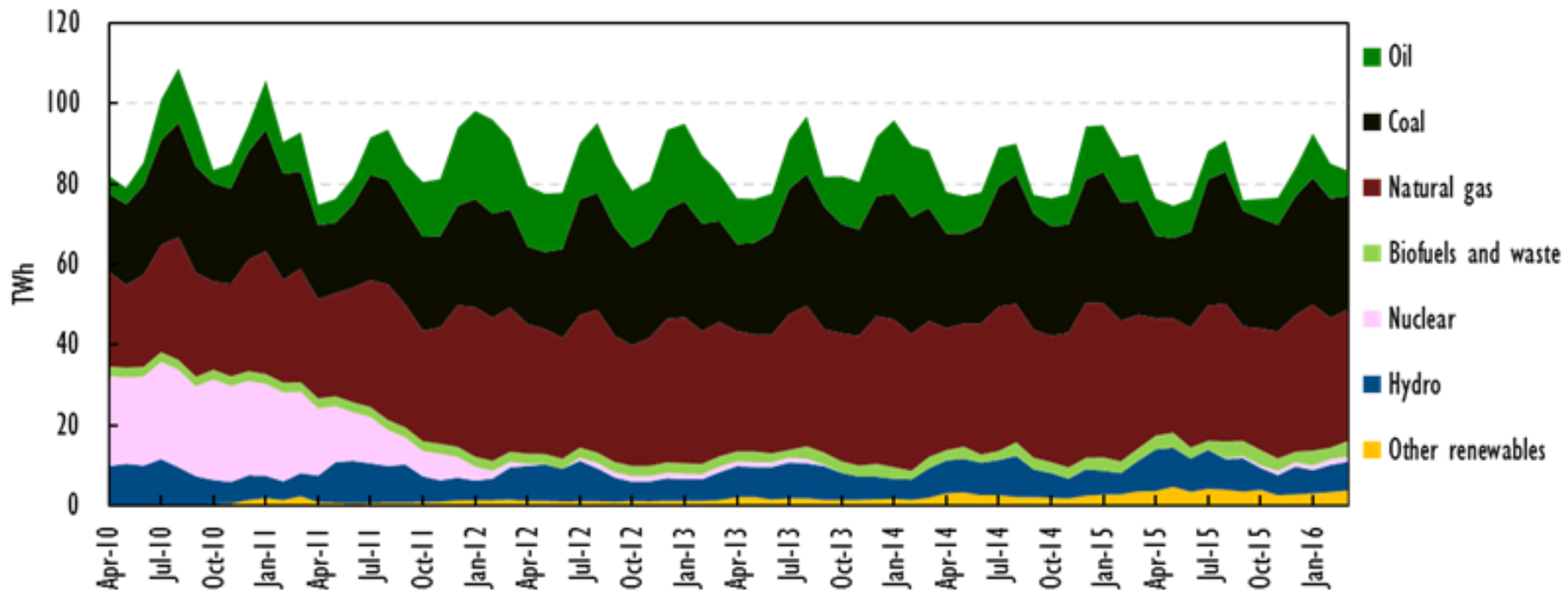
CO₂ emissions in relation to GDP and total primary energy supply



Japan has decoupled energy demand from economic growth, but CO₂ emissions have jumped since 2009.

Electricity generation dominated by fossil fuels, especially since nuclear shutdown

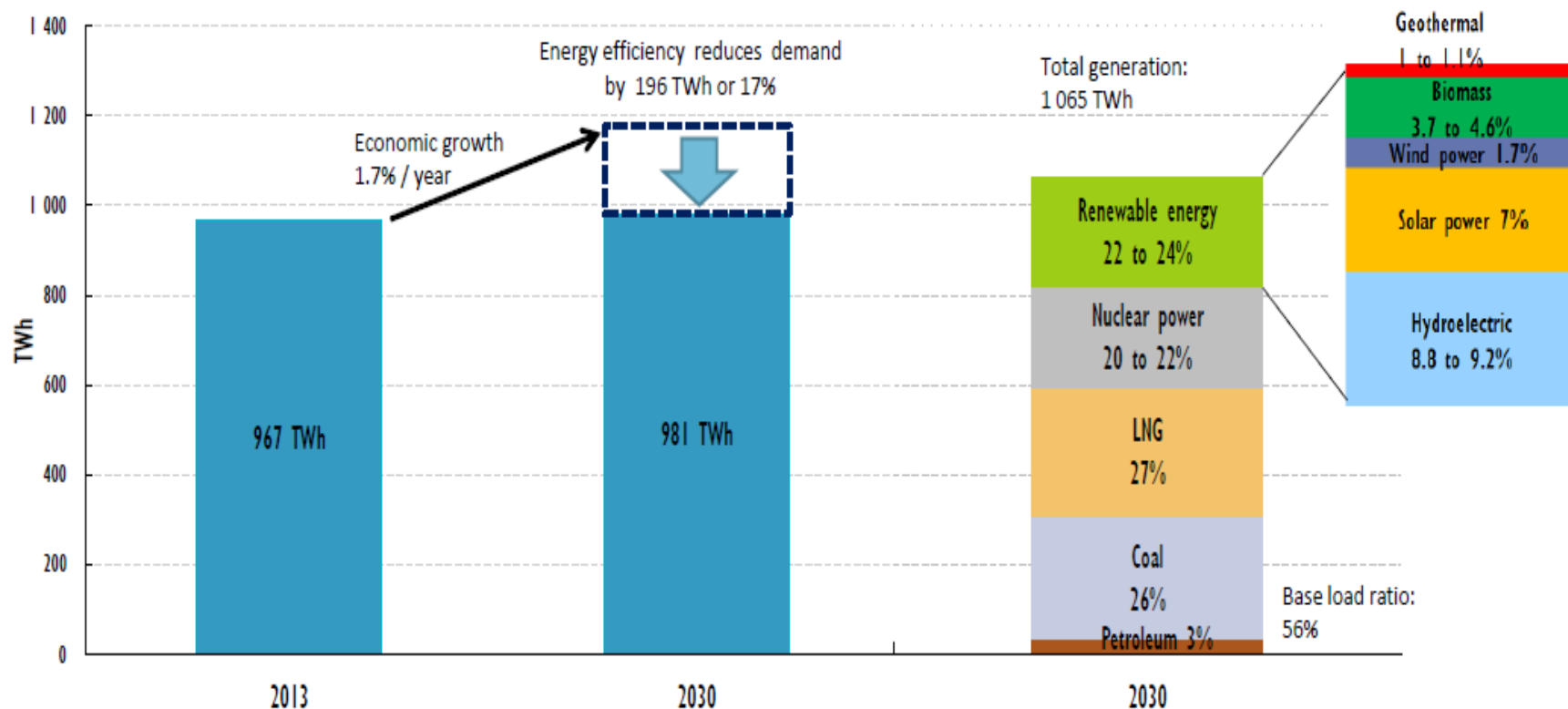
Monthly electricity generation by source, July 2010 to March 2016



Increased use of fossil fuels helped maintain electricity supply, but raised CO₂ emissions, import dependence and electricity prices.

Electricity outlook to 2030

Electricity demand and electricity supply by source



***To reach 2030 INDC (-26% from 2013), fossil fuels use must decline.
The outlook also foresees nuclear restarts and a strong increase in renewables.***

Plans to cut GHG emissions by 2030 and 2050

2030 INDC: -26% from 2013

- Meeting the INDC relies on improving energy efficiency, restarting nuclear power plants and increasing renewable energy supply
- Efficiency: Japan can build on its successful policies and measures for industry, vehicles and appliances. New requirement for buildings to be introduced.
- Nuclear: safety approvals and public acceptance must be won
- Renewables: reducing cost and removing technical and non-technical barriers essential

2050 objective: -80%

- The leap from -26% by 2030 to -80% by 2050 requires new technology
- Japan is world leader in several low-carbon technology sectors already
- National Strategy on Energy Technology Innovation to 2050 adopted in April 2016

Electricity market reform very welcome

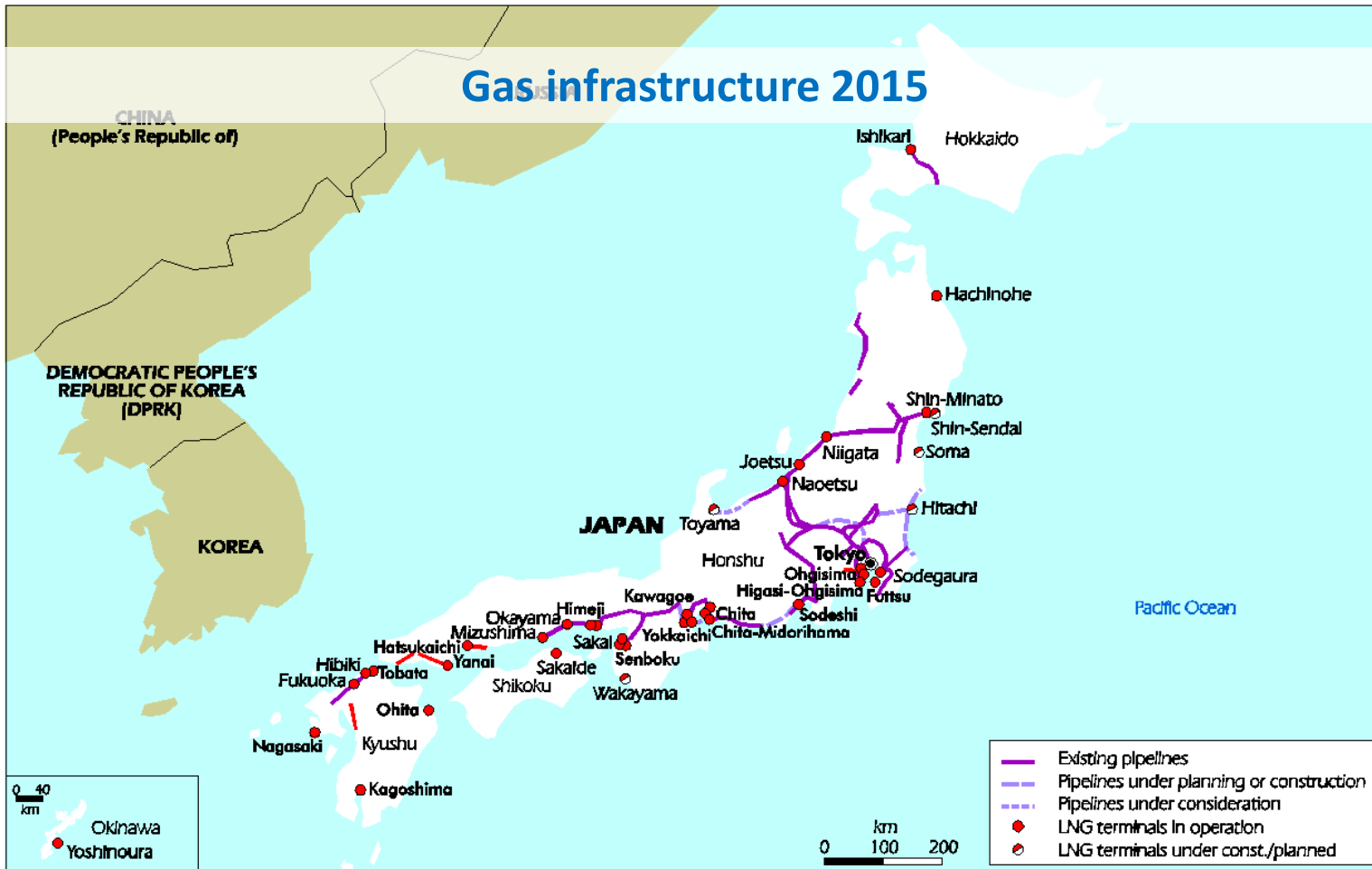
Reform in 2015-20 aims to:

Secure stable supply of electricity, suppress electricity prices, and expand consumer choice and business opportunities.

Suggestions for further steps

- Build more transmission lines and frequency conversion capacity
- Develop the Organization for Cross-regional Co-ordination of Transmission Operators (OCCTO) into a fully independent Transmission System Operator
- Establish regional price zones to give sufficiently strong signals for locating power generation where it is most valuable
- Develop a liquid and transparent wholesale electricity market, including a vibrant power exchange
- Develop demand side response
- Ensure the regulator and competition authority have sufficient independence and resources

IEA also welcomes natural gas market reform



This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area.

Combination of domestic and international market reform efforts should benefit Japanese gas consumers

Renewable energy receiving a boost

- RES can help reduce CO₂ emissions and import dependence
- 2012 feed-in tariffs led to fast growth in renewable electricity generation
- Growth concentrated to some regions and solar PV. Cost control and grid integration became concerns.
- To control costs:
 - tariffs for new facilities are reviewed every year
 - comprehensive reform of the feed-in tariff system and other renewable energy support policies is underway
 - auctions for large solar PV projects will be introduced in April 2017.
- An independent body should be designated to address technical issues with grid integration of variable renewables

IEA recommendations: how can Japan meet its challenges?

- Take measures to meet the 2030 and 2050 objectives
 - ◆ increase low-carbon sources in TPES and electricity supply, and address safety, costs and public acceptance
 - ◆ continue to gradually introduce fiscal incentives and stricter requirements for energy efficiency
 - ◆ promote Japan's proven potential for innovation in low-carbon technologies.
- Fully implement electricity and gas market reforms.
- Continue to support renewable energy, control the costs and aim for a more balanced capacity mix by region and technology.