Melchett Award and Lecture 2017

4 July 2017

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Global Energy Markets and Environment Challenges: Today and Tomorrow

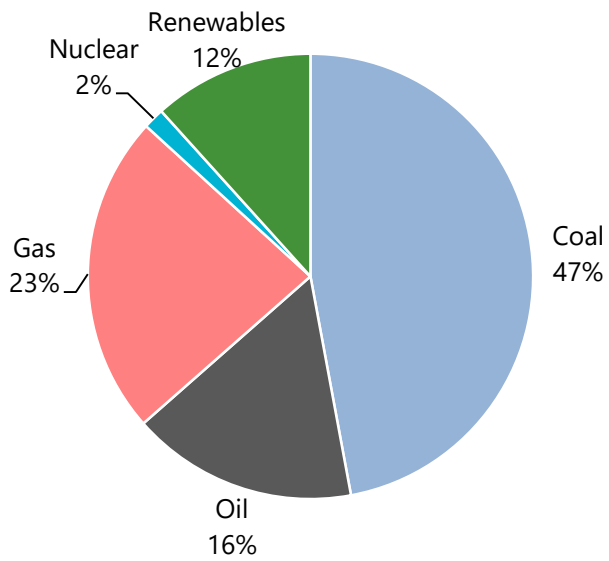
Fatih Birol, Executive Director, International Energy Agency

Melchett Award, Energy Institute, London 4 July 2017

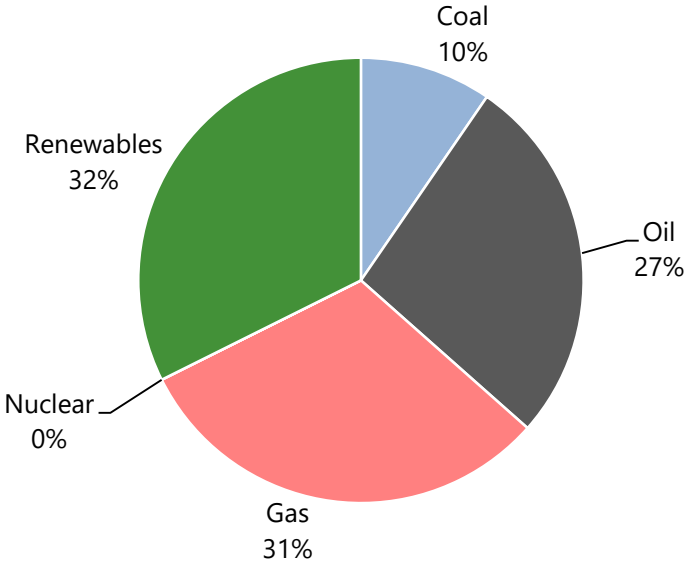
IEA

A rapidly shifting energy landscape

Shares in *growth* in world energy demand



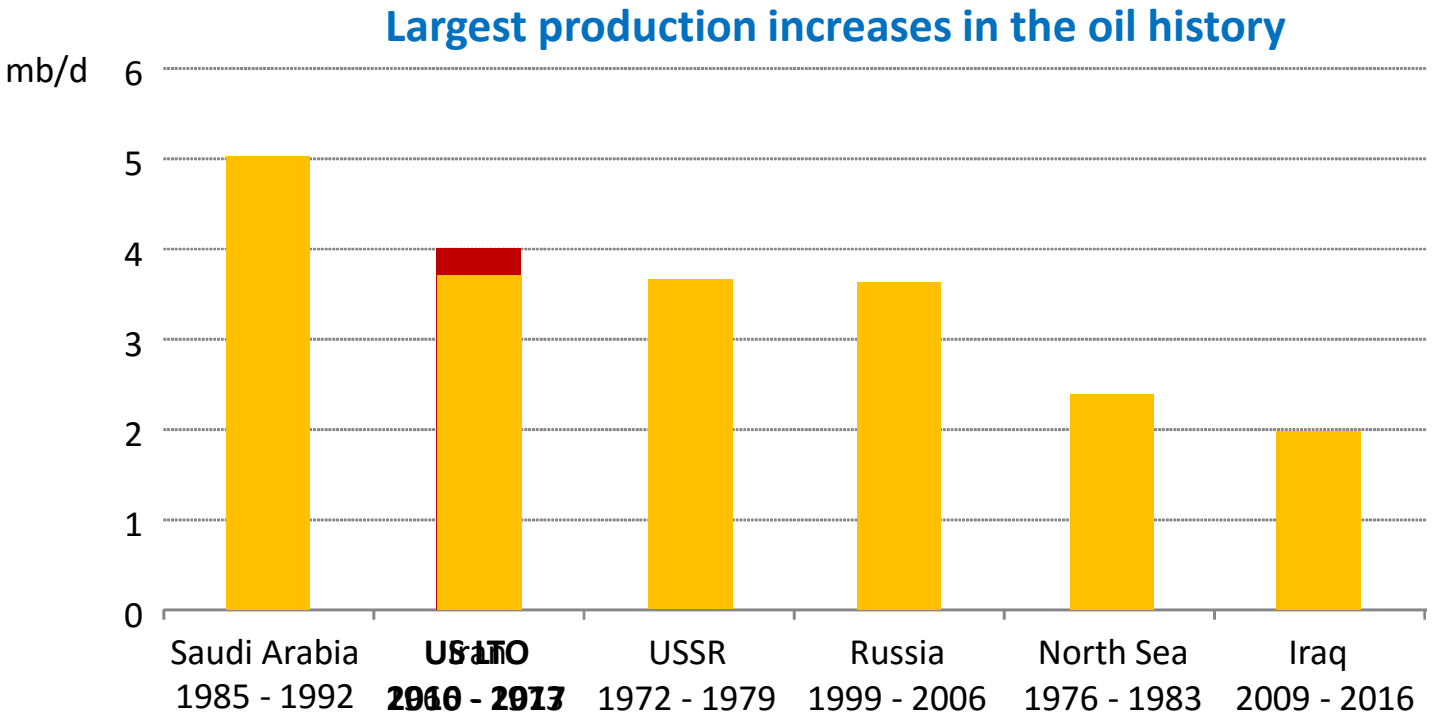
2000-2010



2010-2016

Since 2010, efficiency measures have slowed down growth in global energy consumption . Renewables and natural gas account for almost two-thirds of the growth.

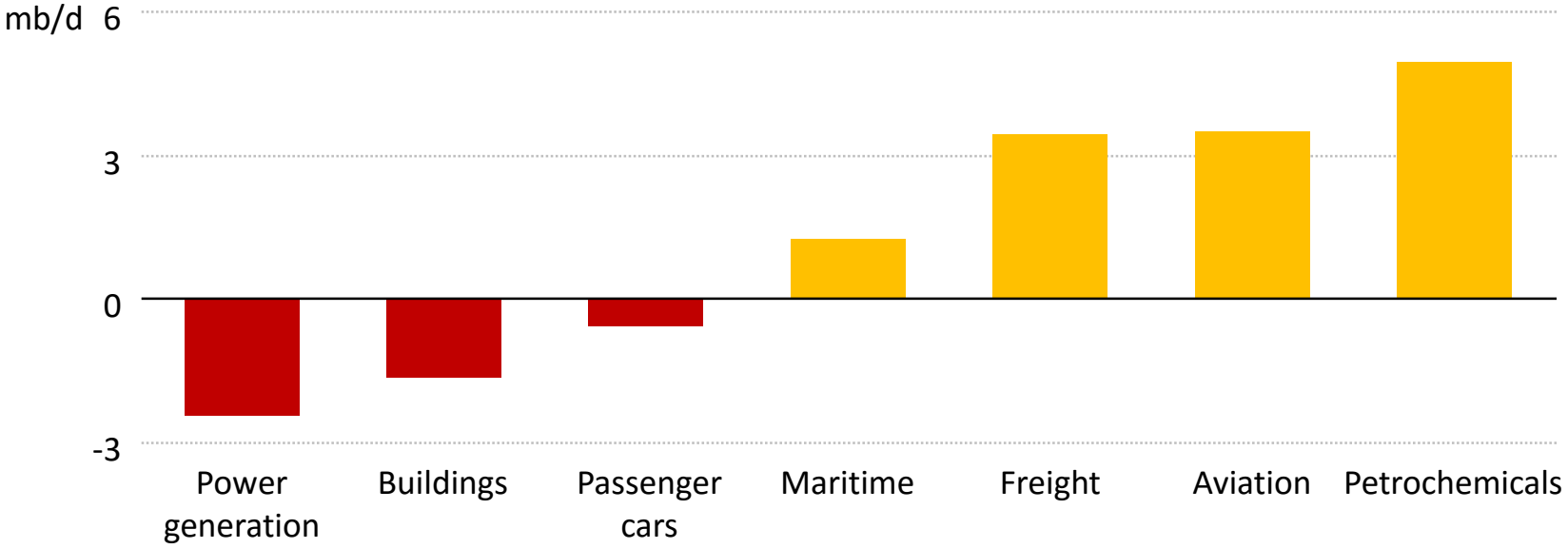
US shale the most successful story in the oil history outside Saudi Arabia



Differently from all other regions, US shale oil growth results from technological and market progress rather than the discovery and deployment of huge oil resources

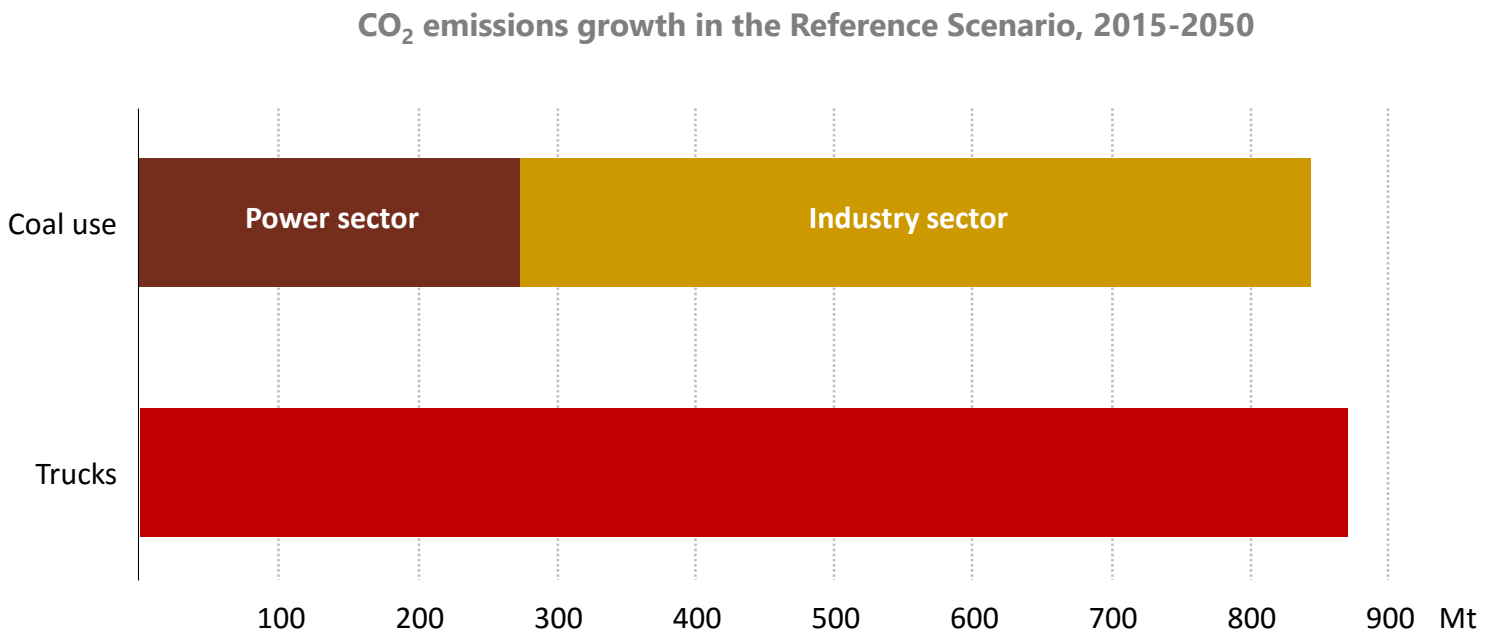
No peak yet in sight, but a slowdown in growth for oil demand

Change in oil demand by sector, 2015-2040



The global car fleet doubles, but efficiency gains, biofuels & electric cars reduce oil demand for passenger cars; growth elsewhere pushes total demand higher

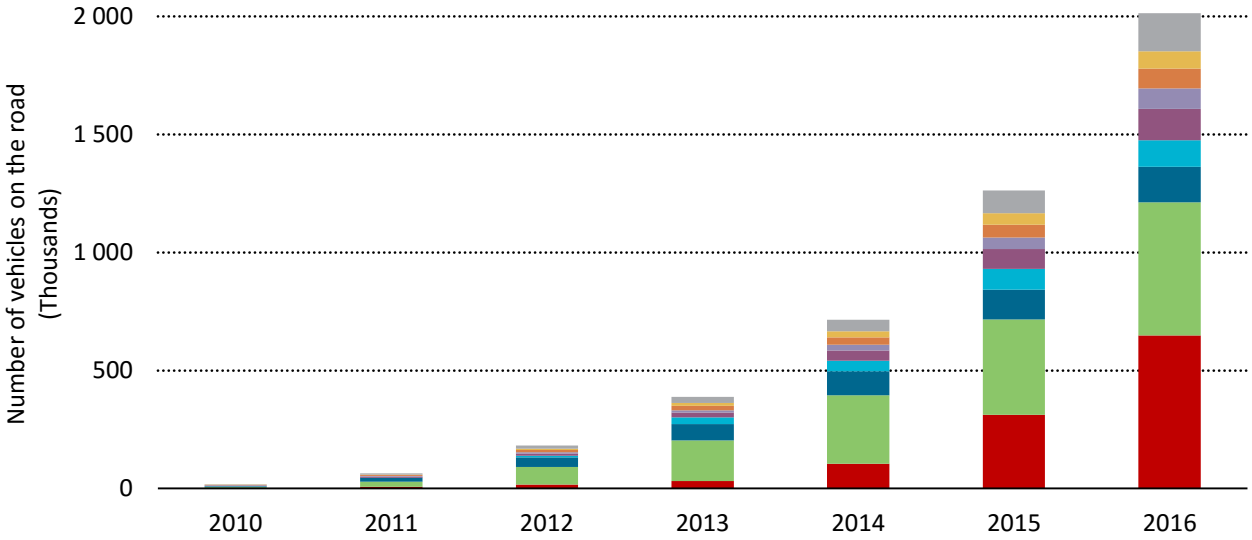
A modern truck sector is still a long haul away



Without further policy efforts, trucks will account for 40% of the oil demand growth to 2050 and 15% of the increase in global CO_2 emissions

On-track: Electric mobility is breaking records, but policy support remains critical

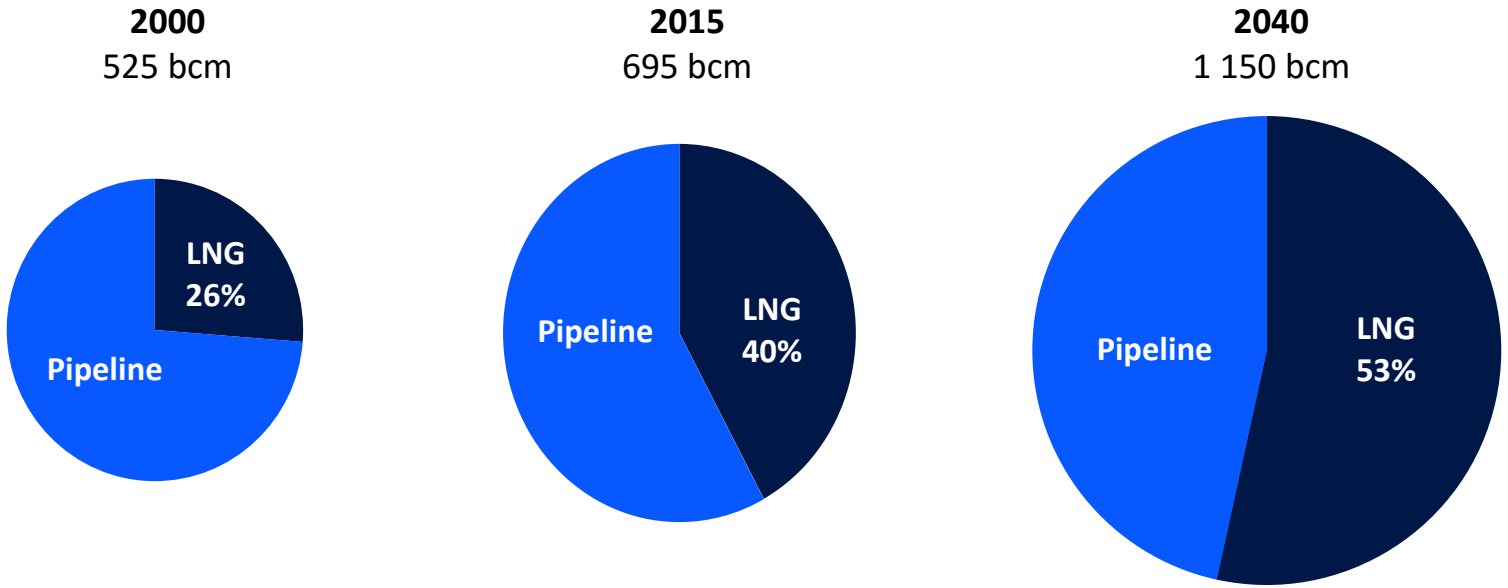
Global electric car fleet



The global electric car fleet passed 2 million last year, but sales growth slipped from 70% in 2015 to 40% in 2016, suggesting the boom may not last without sustained policy support

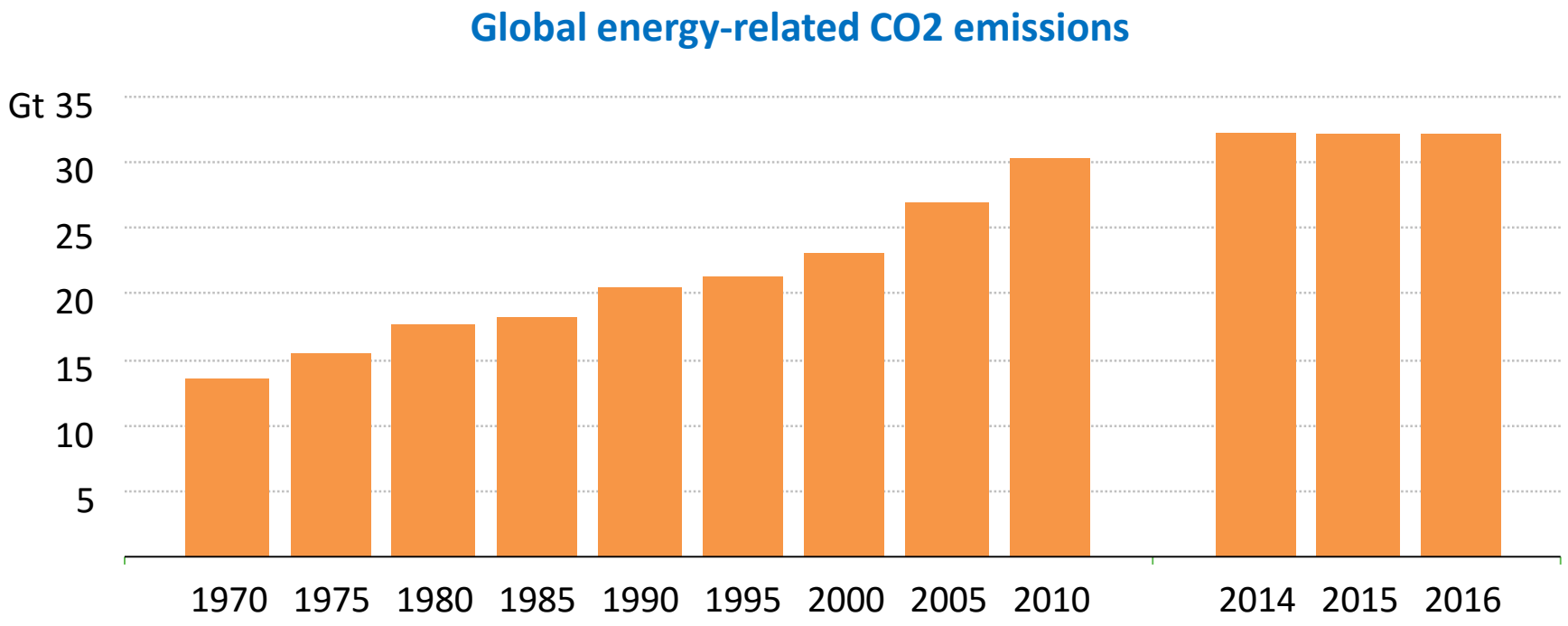
A 2nd natural gas revolution is changing the gas security equation

Share of LNG in global gas trade



A wave of new LNG supply, led by Australia and the US will improve the ability of the system to react to potential demand or supply shocks, but security of gas supply cannot be taken for granted

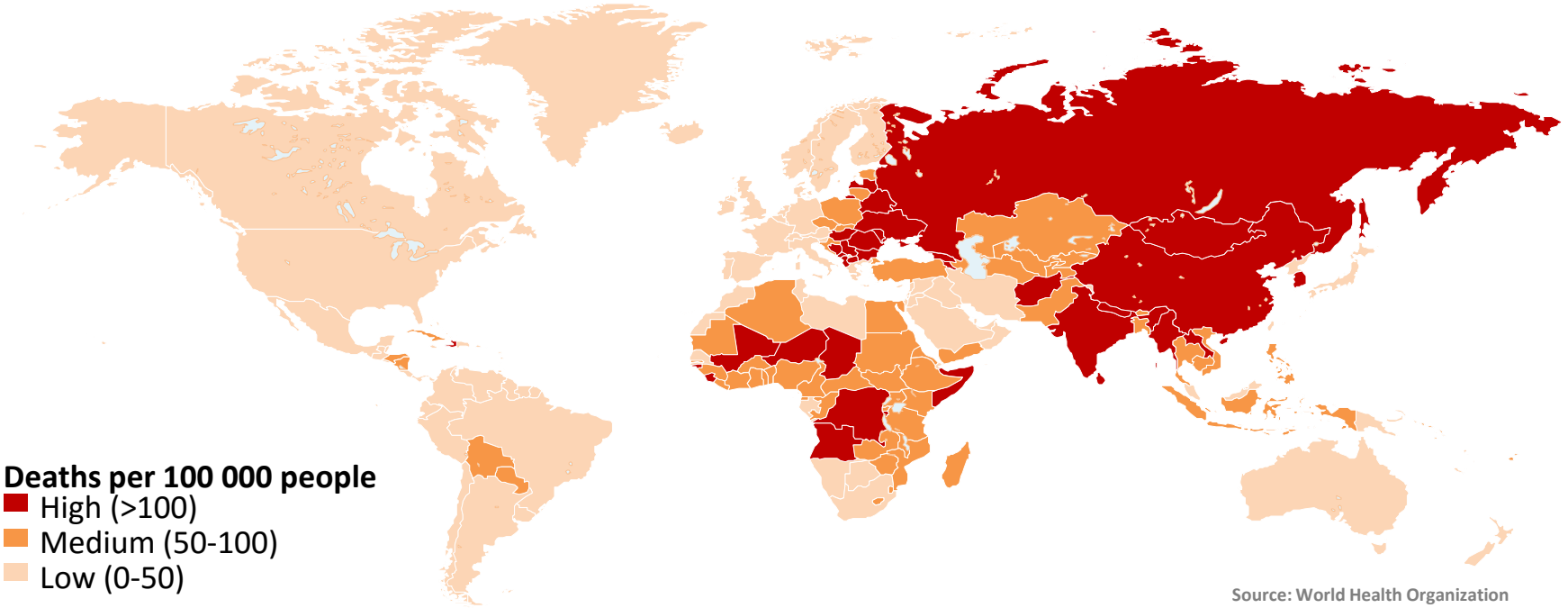
Global CO_2 emissions flat for 3 years – an emerging trend?



IEA analysis shows that global CO_2 emissions remained flat in 2016 for the third year in a row, even though the global economy grew, led by emission declines in the US & China

Air pollution is a universal problem, especially in emerging economies

Premature deaths due to air pollution

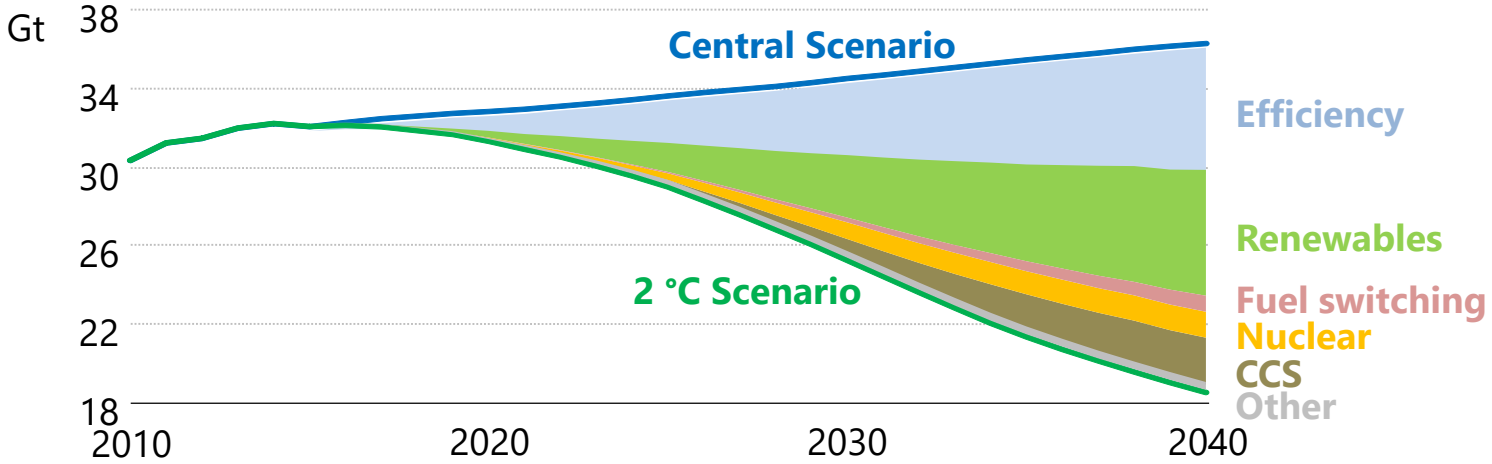


Source: World Health Organization

6.5 million premature deaths every year are caused by pollution from power plants, factories, cars and trucks globally. Air pollution related health risks are largest in cities around the world.

Efficiency and renewables key to global climate change mitigation

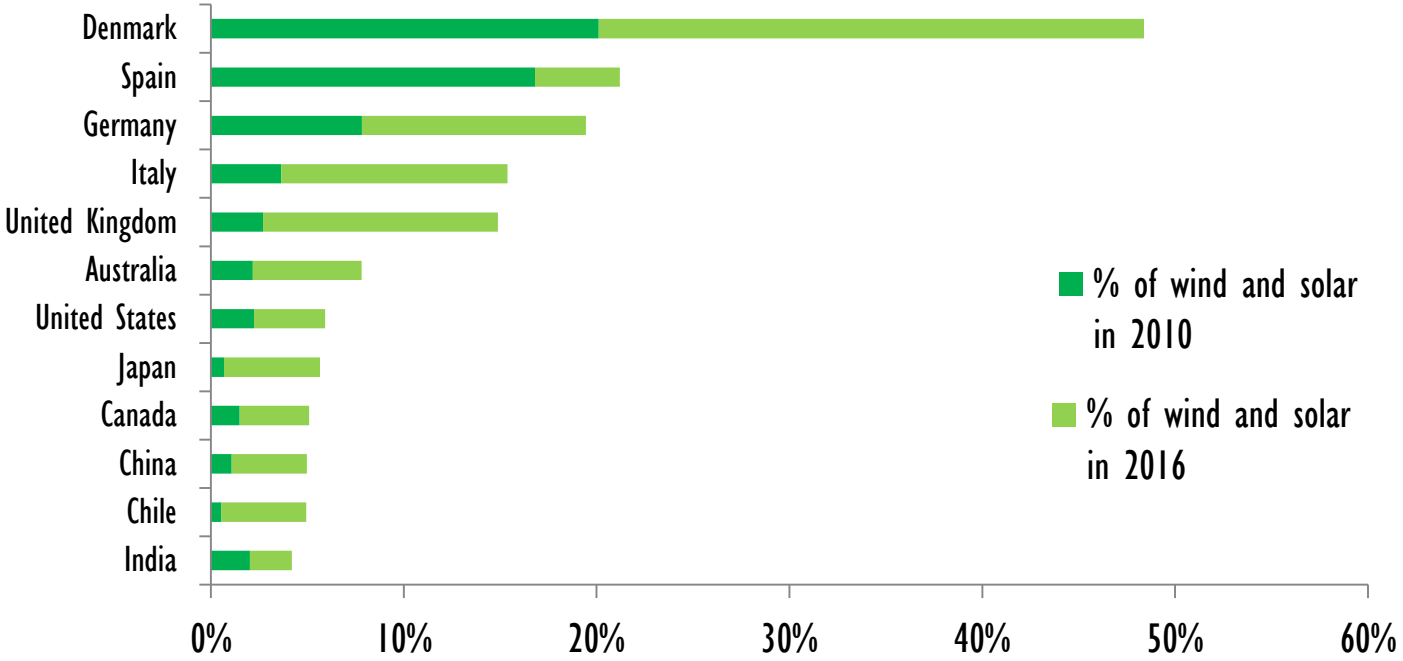
Global CO2 emissions reductions in the Central & 2 °C Scenario by technology



Supply-side investment needs to be re-directed, not increased; demand-side investment for energy efficiency, electrification & renewables needs to ramp up significantly.

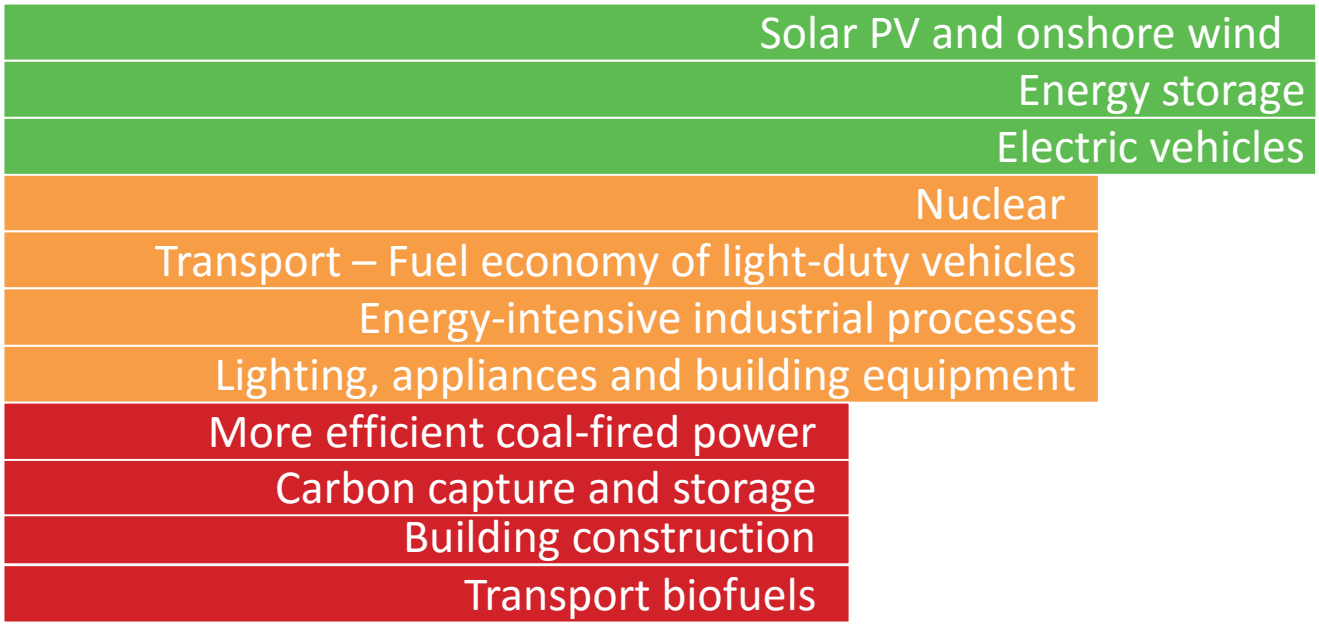
Wind & solar transforming the power sector: system integration is key

Share of wind and solar in total electricity generation in selected countries



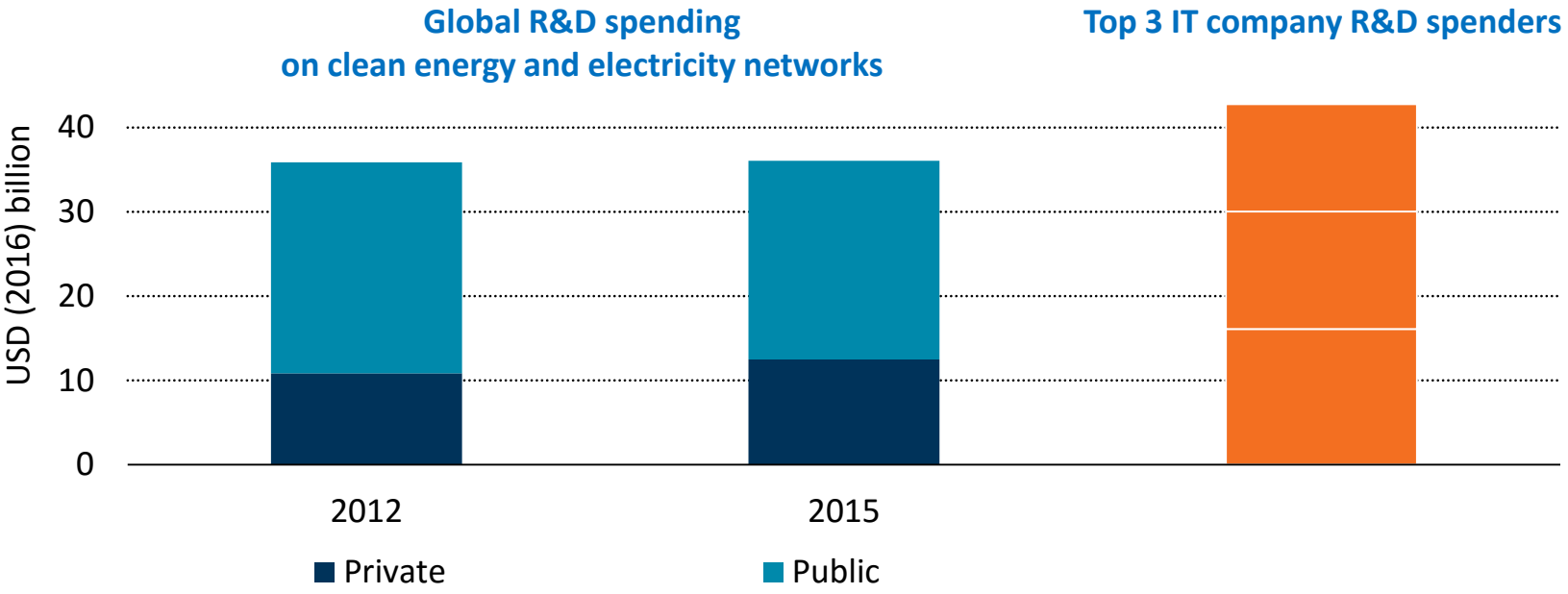
Better grids, more flexible power plants and storage & demand side response will be needed to integrate larger shares of wind & solar in a secure and cost-effective way

The potential of clean energy technology remains under-utilised



Recent progress in some clean energy areas is promising, but many technologies still need a strong push to achieve their full potential and deliver a sustainable energy future

Global clean energy R&D funding needs a strong boost



We've tracked a steady $37 billion/year of clean energy and electricity networks R&D spending, with room for growth from the private sector. As a share of GDP, China now spends most on energy R&D

Closing remarks

- **While a continued focus on oil security is essential, a broader approach to energy security is needed to reflect changing nature of natural gas & electricity markets**
- **US shale oil triggers a deep transformation of oil industry dynamics**
- **A wave of LNG is the catalyst for a second natural gas revolution, with far-reaching implications for gas pricing & contracts**
- **The next chapter in the rise of renewables requires more work on systems integration & expanding their use beyond the power sector**
- **Limiting the global temperature rise to 2°C would require an energy transition of exceptional scope, depth & speed, including stronger R&D efforts**