



Global energy: today and tomorrow

Dr. Fatih Birol

Executive Director, International Energy Agency

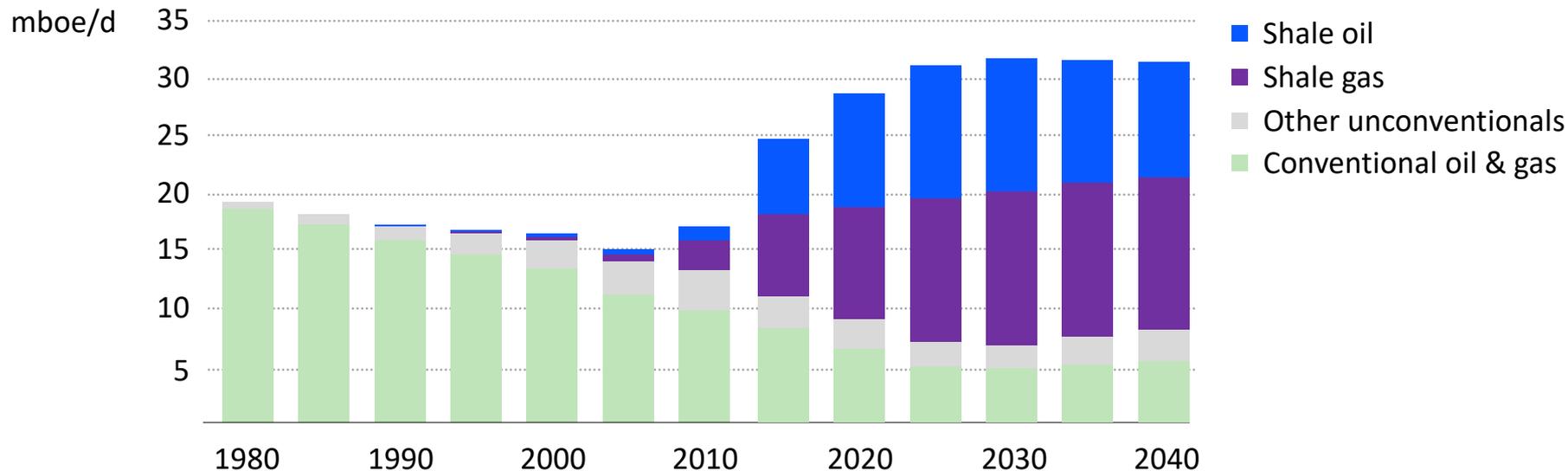
The Hague, 26 March 2018



- Four **large-scale upheavals** in global energy are underway:
 - The **United States** is turning into the undisputed global leader for oil & gas
 - **Solar PV** is on track to be the cheapest source of new electricity in many countries
 - **China's** new drive to “make the skies blue again” is recasting its role in energy
 - The future is **electrifying**, spurred by cooling, electric vehicles & digitalisation
- There are many possible pathways ahead & many potential pitfalls if governments or industry misread the signs of change

United States becomes undisputed leader of oil & gas production

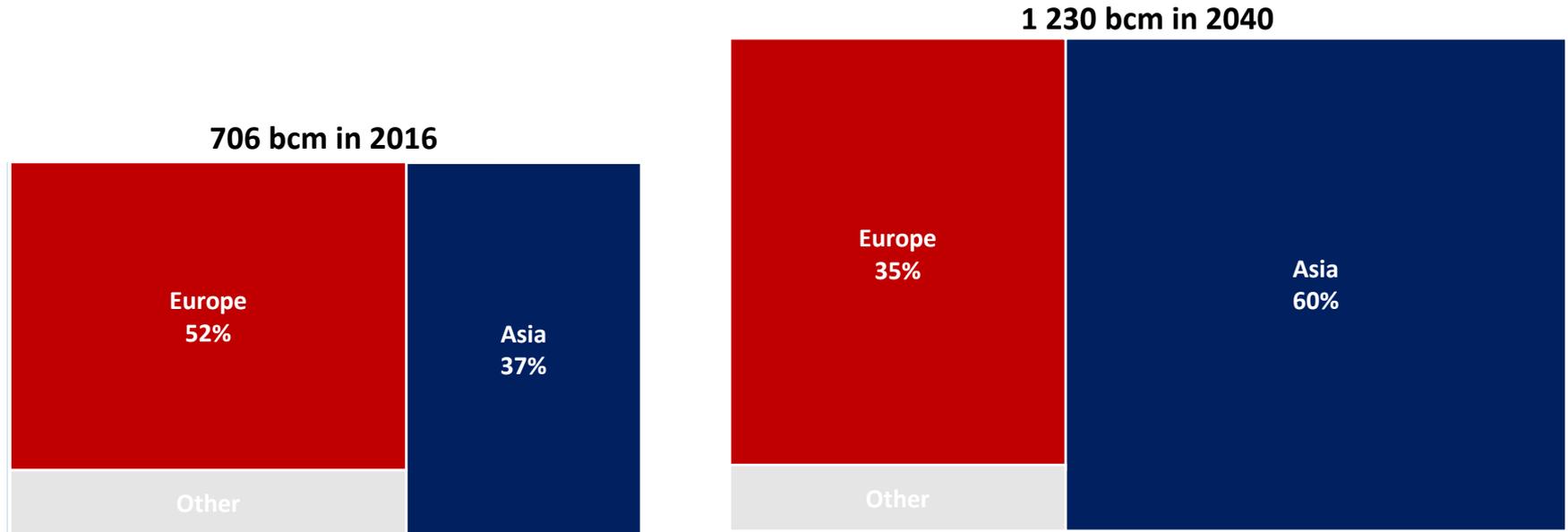
Oil & gas production in the United States



The United States is already switching to become a net exporter of gas & becomes a net exporter of oil in the 2020s, helped also by the demand-side impact of fuel efficiency & fuel switching

Strong outlook as LNG ushers in a new global gas order

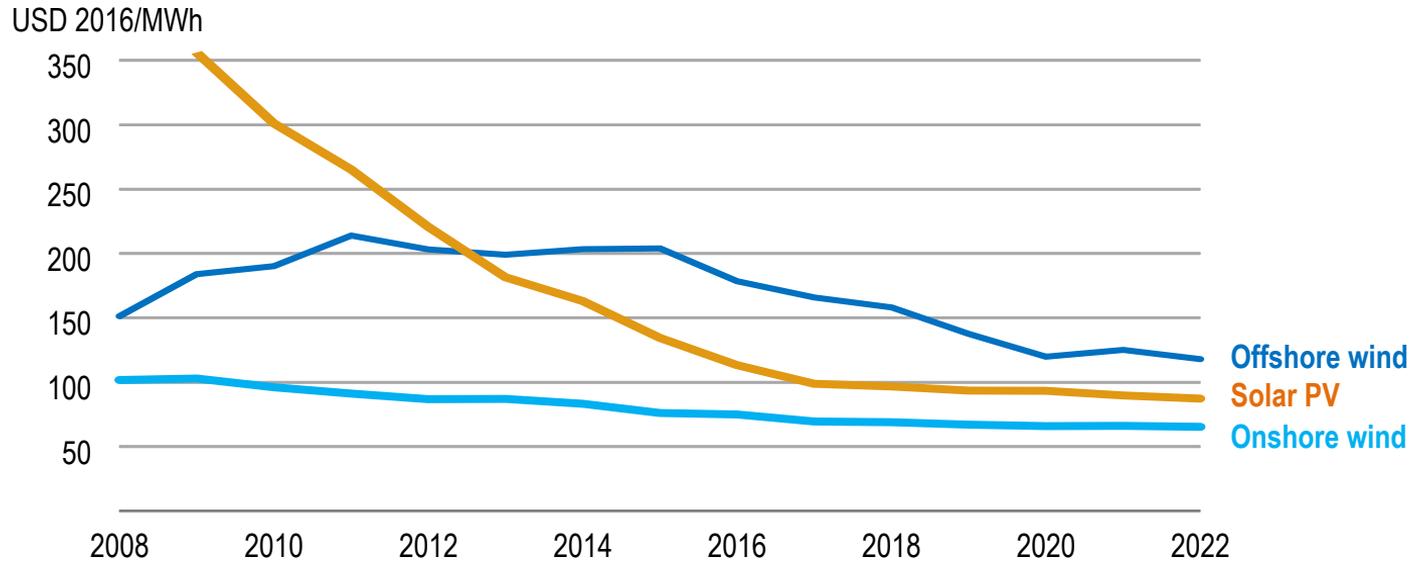
Gas importers



Growing gas import requirements in developing Asia, Japan & Korea are largely met by LNG, with exports from the United States & Australia accelerating a shift to a flexible, liquid global market

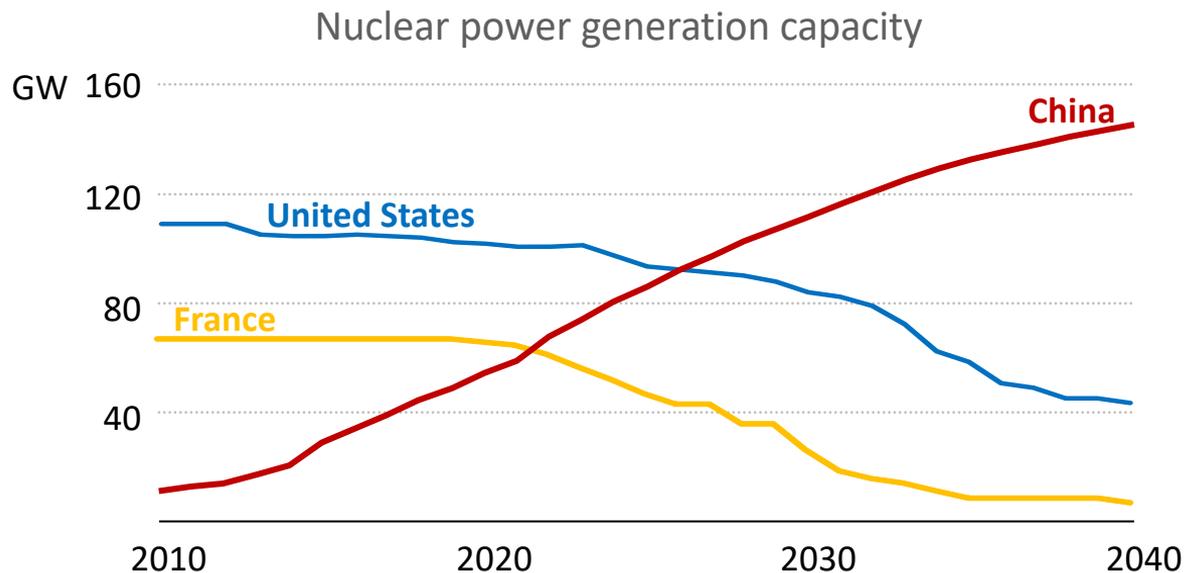
Wind & solar costs being driven down by competition

Wind & solar PV average costs



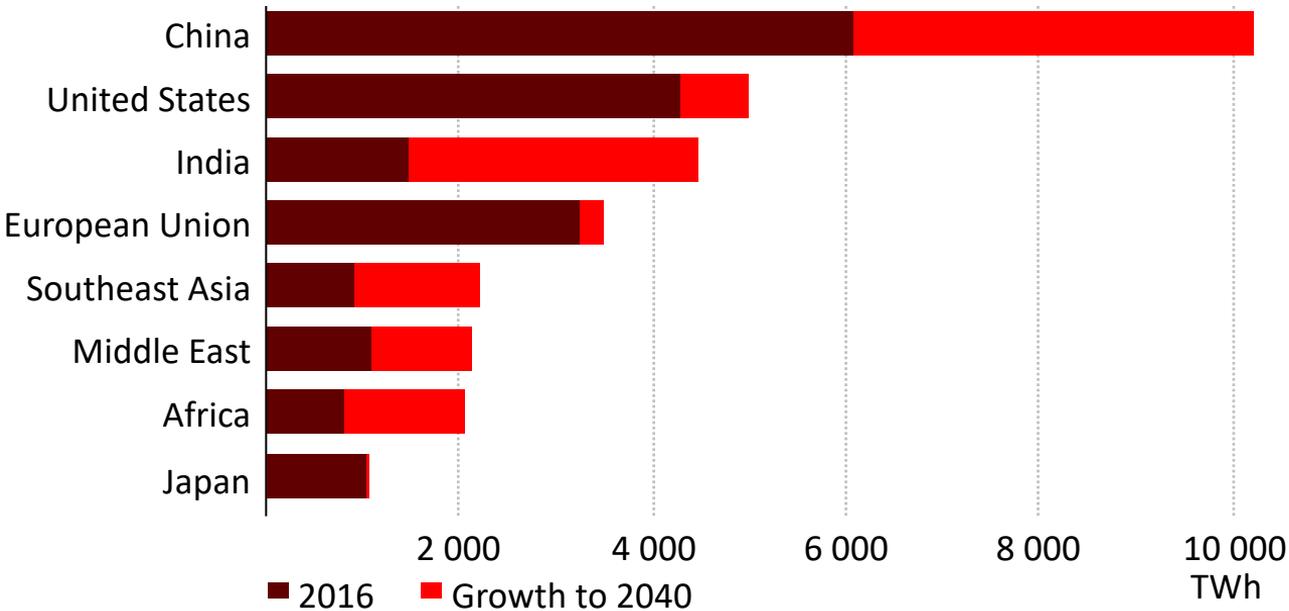
The cost of wind & solar PV have fallen sharply, with further reductions expected; cost-optimal integration requires interconnections, flexible generation, storage & demand response

A new leader emerging on nuclear



Without additional lifetime extensions, the largest nuclear fleets face significant declines, while China is soon set to overtake the United States as the global leader

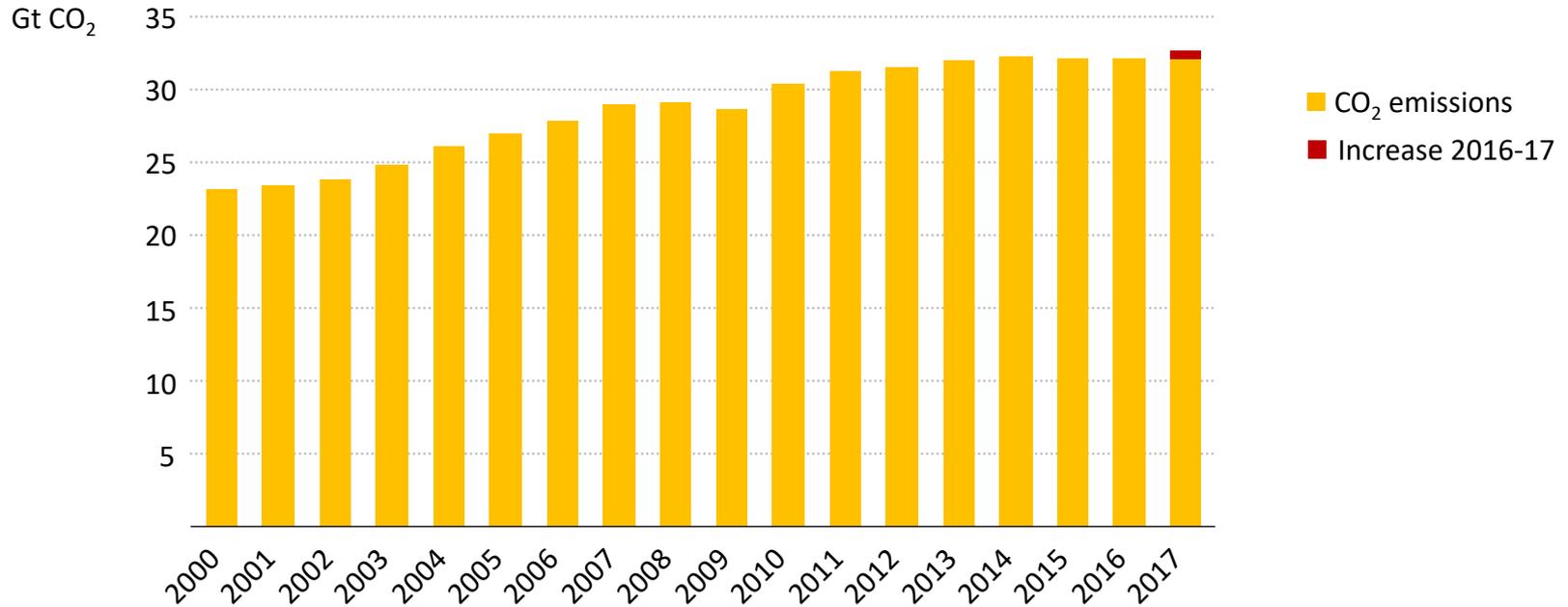
Electricity generation by selected region



India adds the equivalent of today's European Union to its electricity generation by 2040, while China adds the equivalent of today's United States

After three years of plateau, global emissions increase again

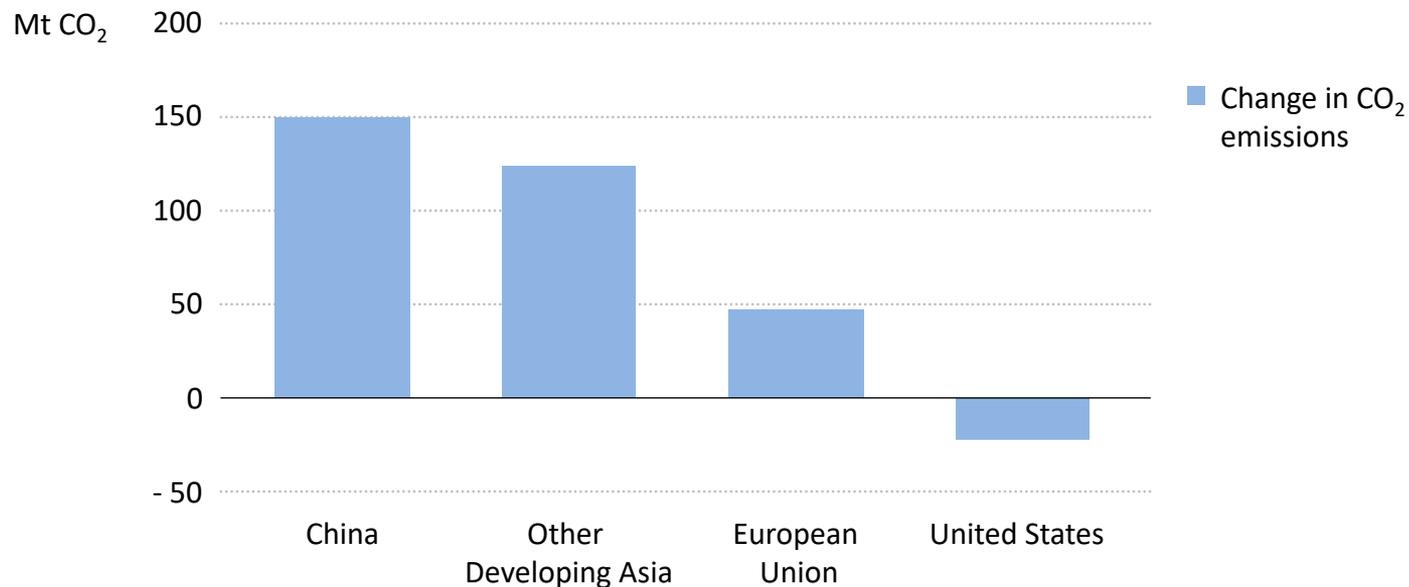
CO₂ energy-related emissions



IEA estimates show that global energy-related CO₂ emissions reached a historic high in 2017, telling us that current efforts to combat climate change are far from sufficient

Emissions growth was not universal

Change in energy-related CO₂ emissions by region, 2016-2017



**Emissions increased in most major economies,
But the United States, United Kingdom, Mexico and Japan were notable exceptions**

- The oil & gas boom in the United States is shaking up the established order, with major implications for markets, trade flows, investment & energy security
- The versatility of natural gas means that it is well placed to grow, but it cannot afford price spikes or uncertainty over methane leaks
- China continues to shape global trends, but in new ways as its “energy revolution” drives cost reductions for a wide range of clean energy technologies
- Action to address climate change can be fully fully compatible with global goals on universal access & air quality
- Electrification & digitalisation are the future for many parts of the global energy system, creating new opportunities but also risks that policy makers have to address

- Making the IEA a **truly global agency**
 - Mexico became 30th member country in February 2018
 - Since 2015, Brazil, China, India, Indonesia, Morocco, Singapore & Thailand have all become Associate members
 - Extended IEA family now accounts for over 70% of the world's total energy consumption, up from less than 40% two years ago
- Strengthening & broadening the **commitment to energy security**
- Enhancing the focus on **energy efficiency & clean energy technologies**



www.iea.org

