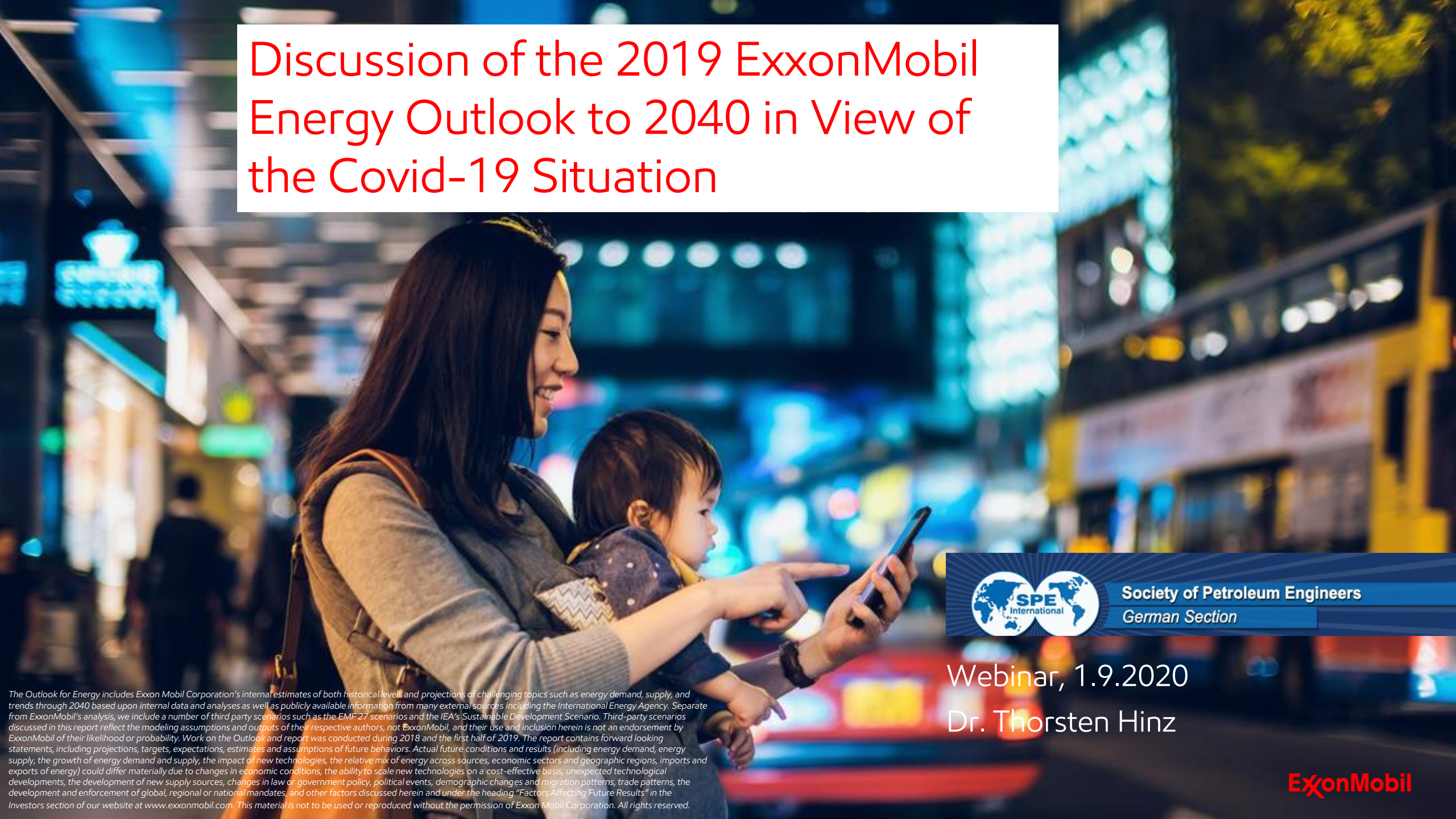
Discussion of the 2019 ExxonMobil Energy Outlook to 2040 in View of the Covid-19 Situation



Society of Petroleum Engineers
German Section

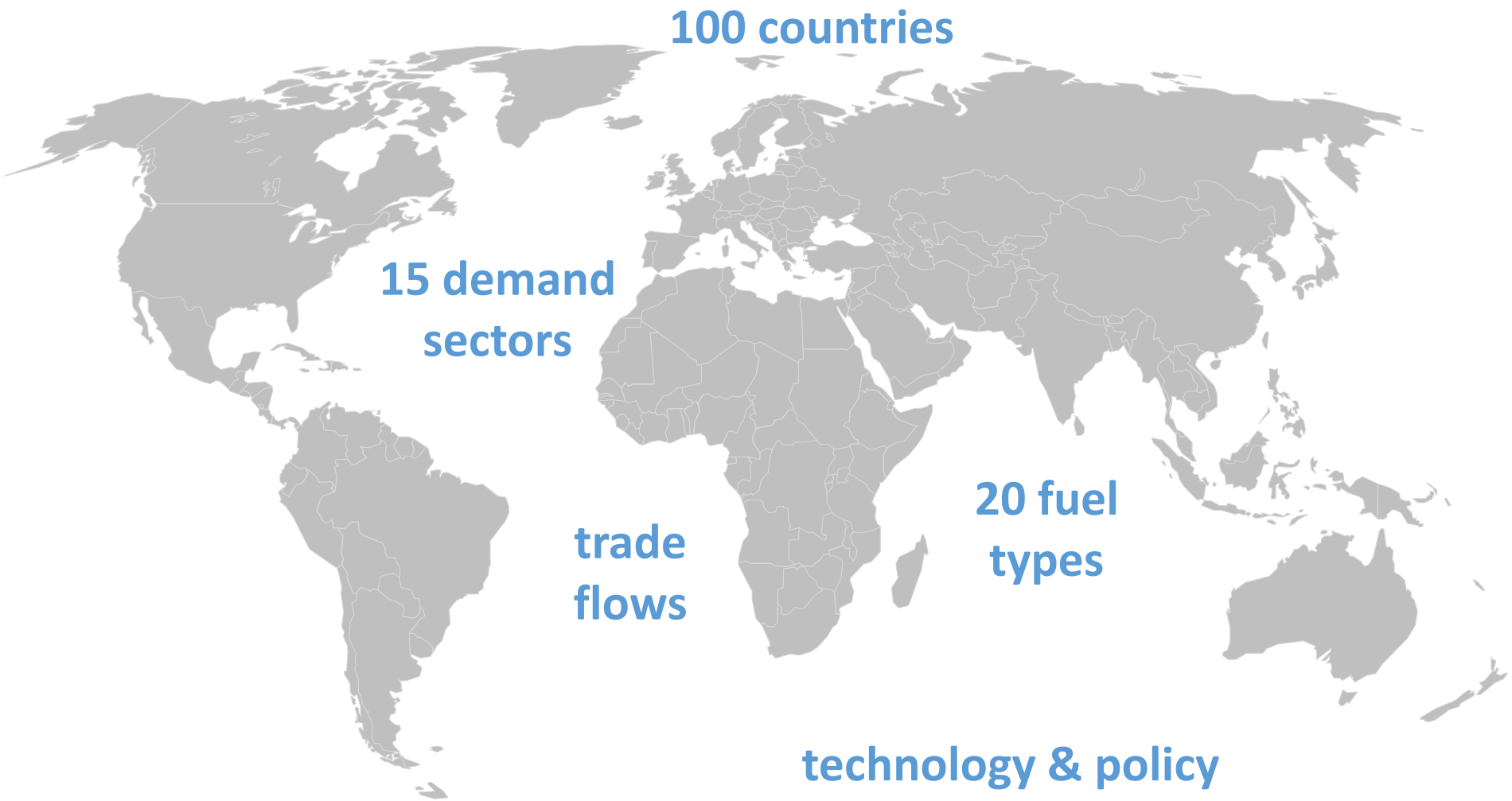
Webinar, 1.9.2020

Dr. Thorsten Hinz

ExxonMobil

The Outlook for Energy includes Exxon Mobil Corporation's internal estimates of both historical levels and projections of challenging topics such as energy demand, supply, and trends through 2040 based upon internal data and analyses as well as publicly available information from many external sources including the International Energy Agency. Separate from ExxonMobil's analysis, we include a number of third party scenarios such as the EMF 27 scenarios and the IEA's Sustainable Development Scenario. Third-party scenarios discussed in this report reflect the modeling assumptions and outputs of their respective authors, not ExxonMobil, and their use and inclusion herein is not an endorsement by ExxonMobil of their likelihood or probability. Work on the Outlook and report was conducted during 2018 and the first half of 2019. The report contains forward looking statements, including projections, targets, expectations, estimates and assumptions of future behaviors. Actual future conditions and results (including energy demand, energy supply, the growth of energy demand and supply, the impact of new technologies, the relative mix of energy across sources, economic sectors and geographic regions, imports and exports of energy) could differ materially due to changes in economic conditions, the ability to scale new technologies on a cost-effective basis, unexpected technological developments, the development of new supply sources, changes in law or government policy, political events, demographic changes and migration patterns, trade patterns, the development and enforcement of global, regional or national mandates, and other factors discussed herein and under the heading "Factors Affecting Future Results" in the Investors section of our website at www.exxonmobil.com.

Energy Outlook Development

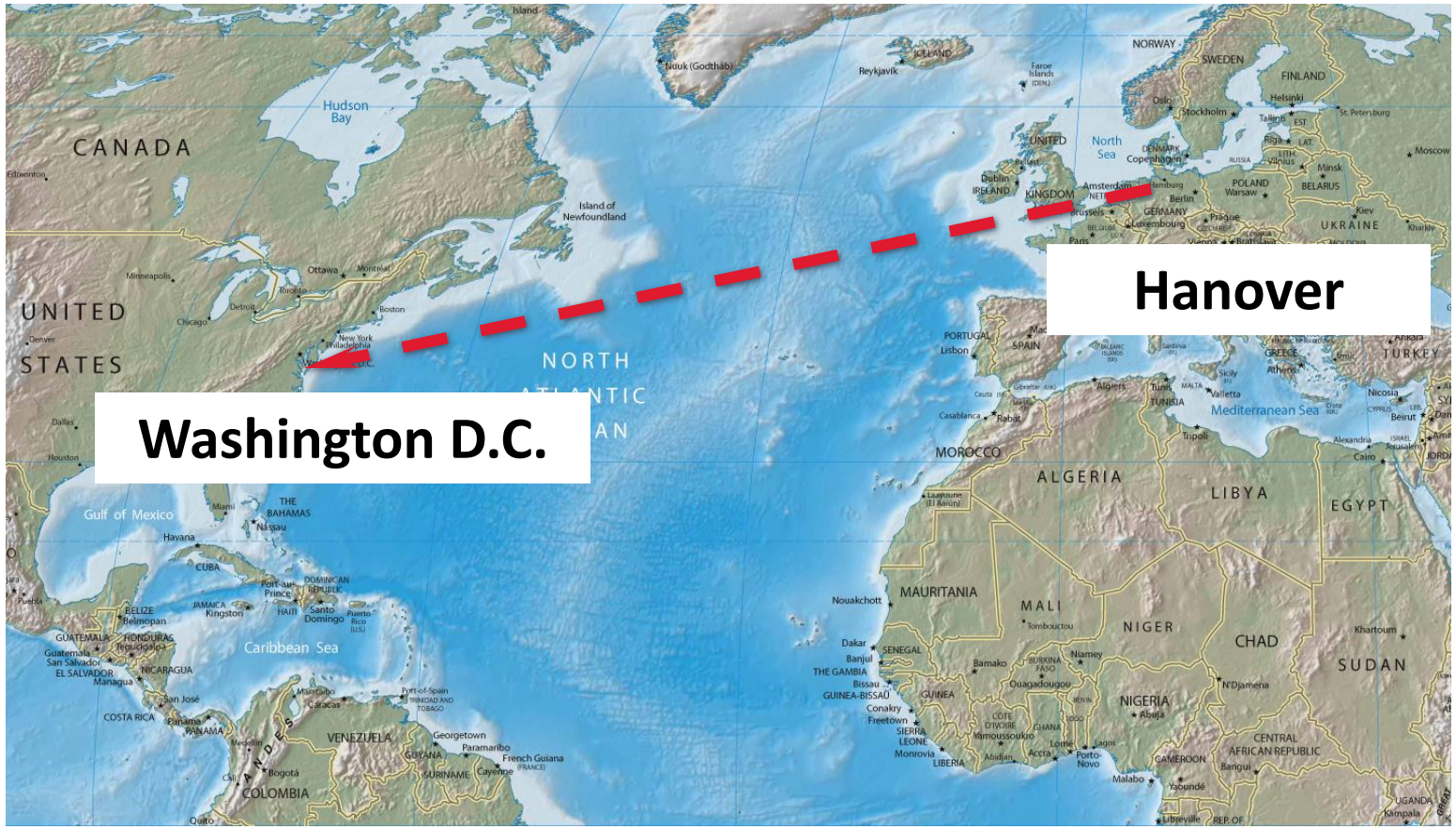



DUAL CHALLENGE

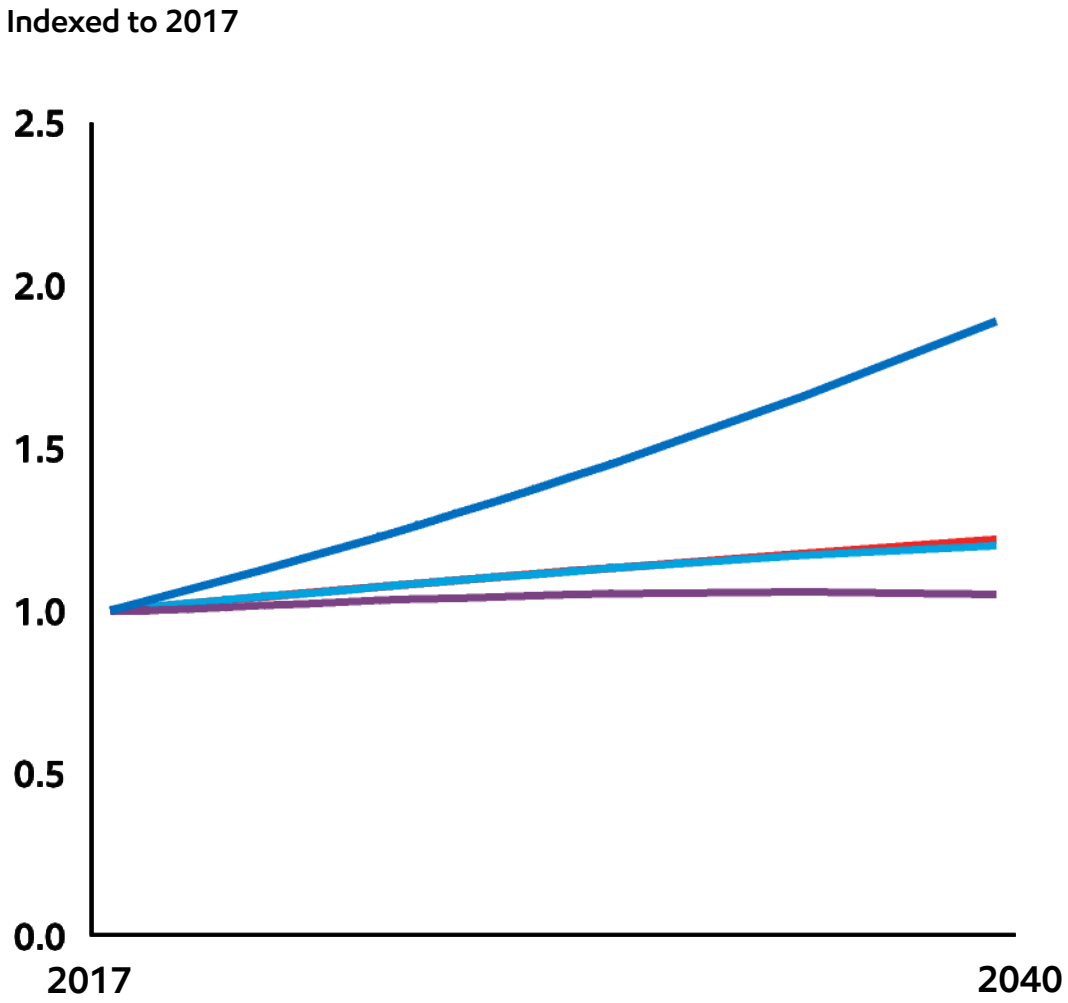
FUNDAMENTALS

The economy and population drive energy demand

Daily energy demand



World Energy Trends



+71 trillion GDP

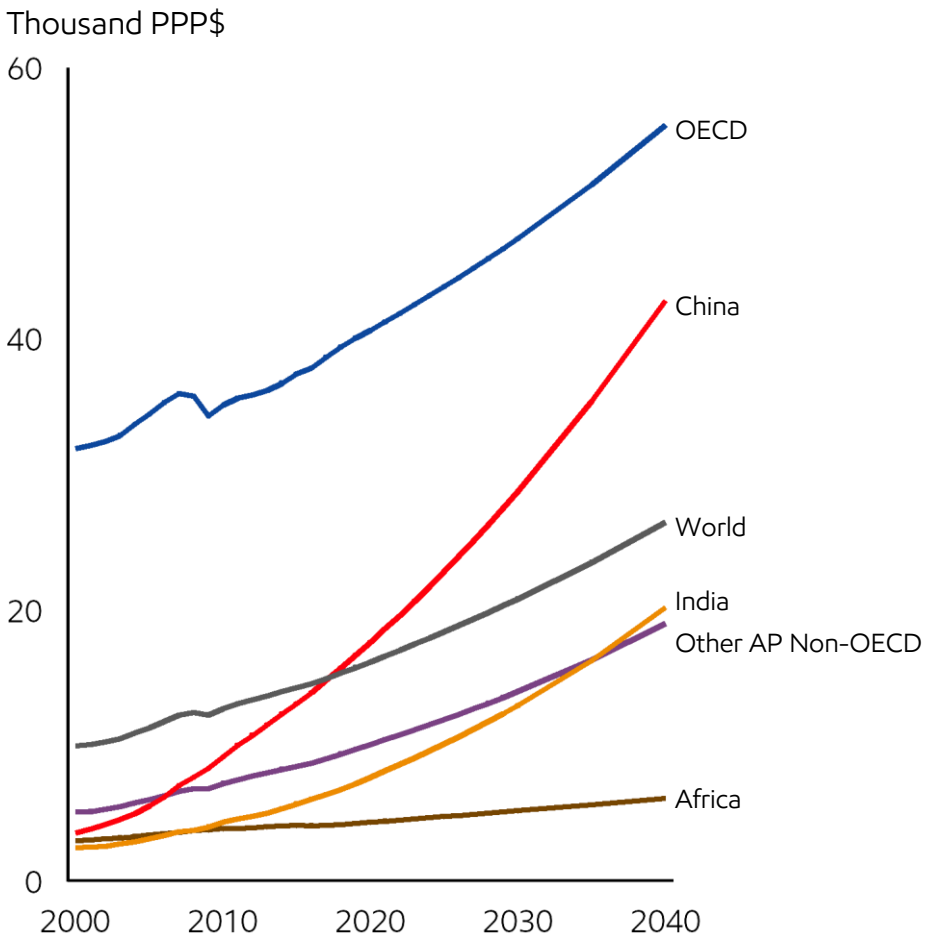
+1.6 billion people

+20 percent demand

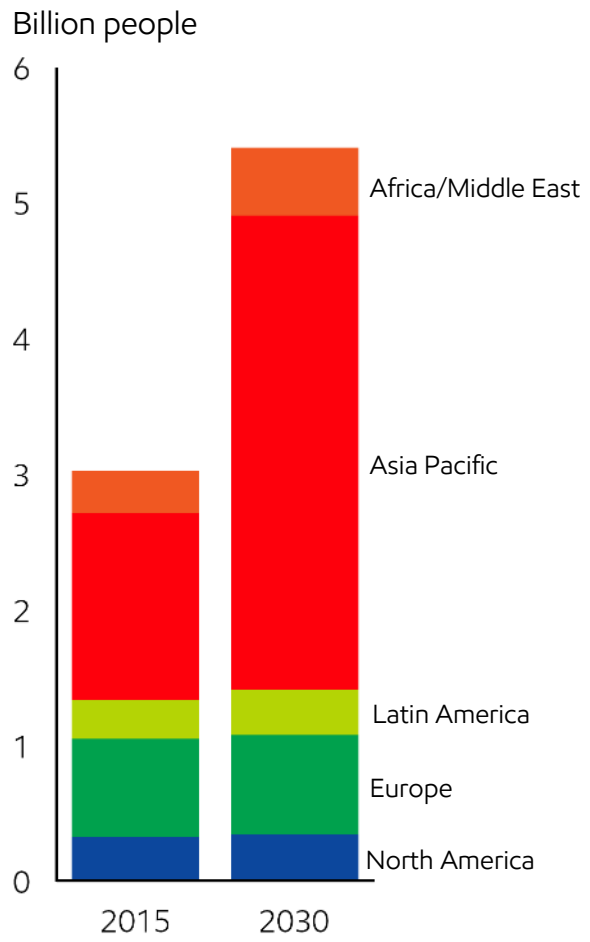
+5 percent carbon emissions

Purchasing Power expands

GDP per capita



Global middle class nearly doubles

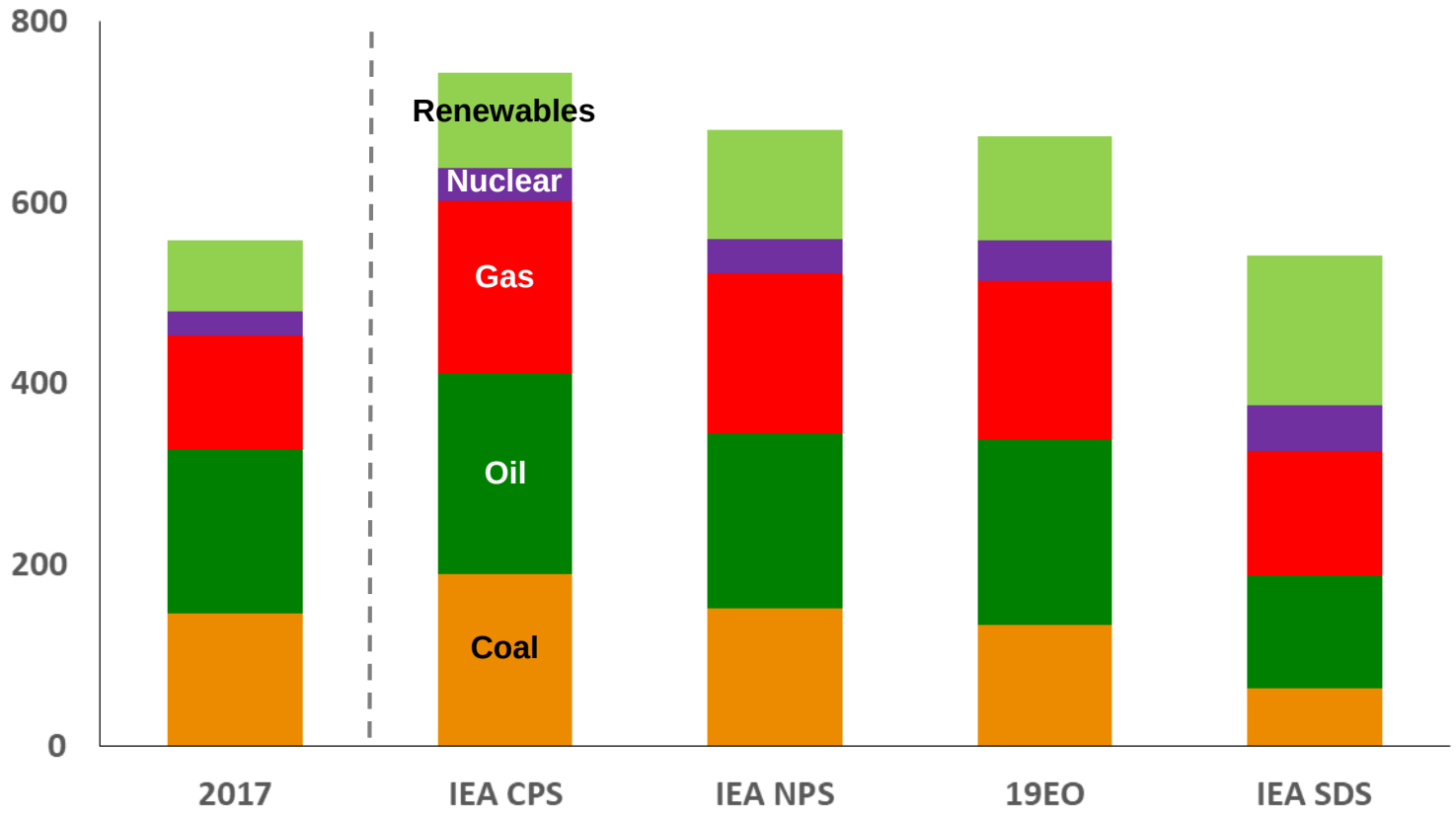


Source: The Brookings Institution - Global Economy & Development 2017

The Energy Challenge

2040 Global Demand: *Outlook* vs. IEA Scenarios

Quadrillion BTUs



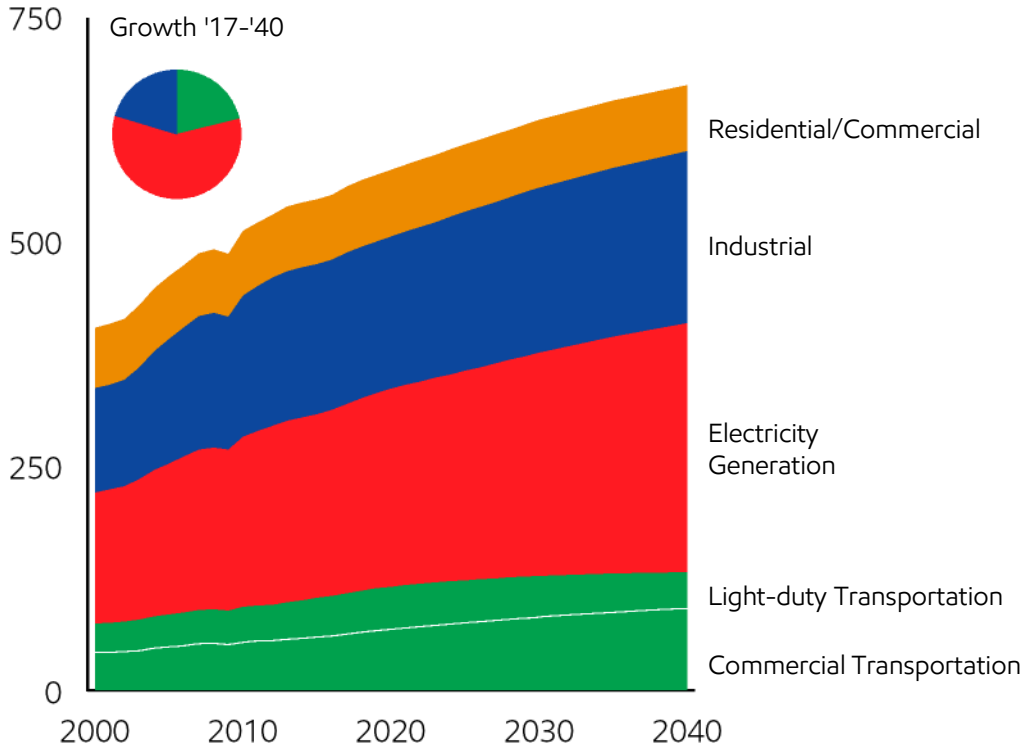
Source: Estimates based on IEA *World Energy Outlook 2018* and *2019 Outlook for Energy*; includes adjustments to common basis

DEMAND: THREE DRIVERS

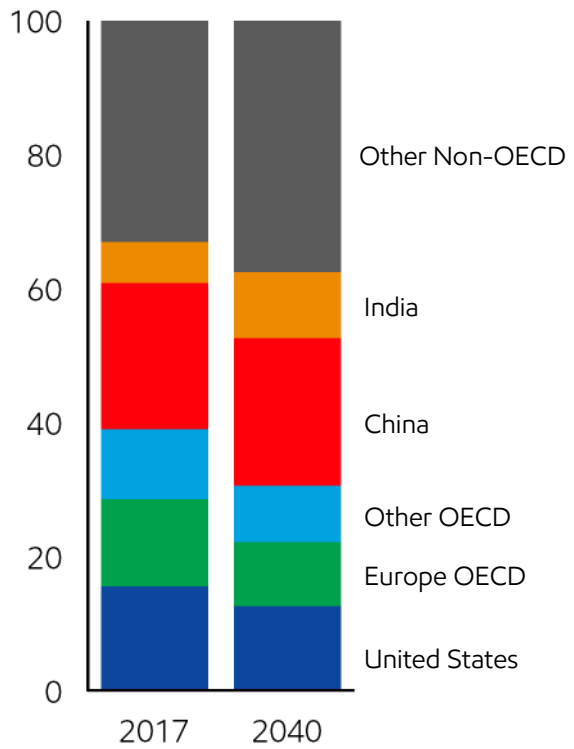
POLICY. TECHNOLOGY. CONSUMER PREFERENCES.
All three impact how the world uses energy.

Energy trends vary by sector and geography

Global energy demand by sector
Primary energy – Quadrillion BTUs



Relative energy demand by region
Percent of primary energy (%)



SUPPLY

An evolving energy supply mix is required to meet growing demand

Projected share of 2040 energy

OIL

GAS

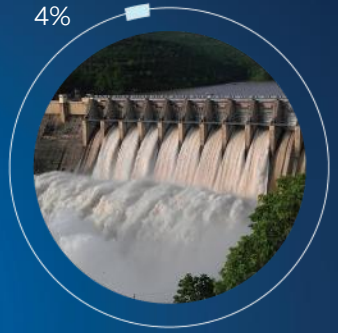
COAL

BIOMASS

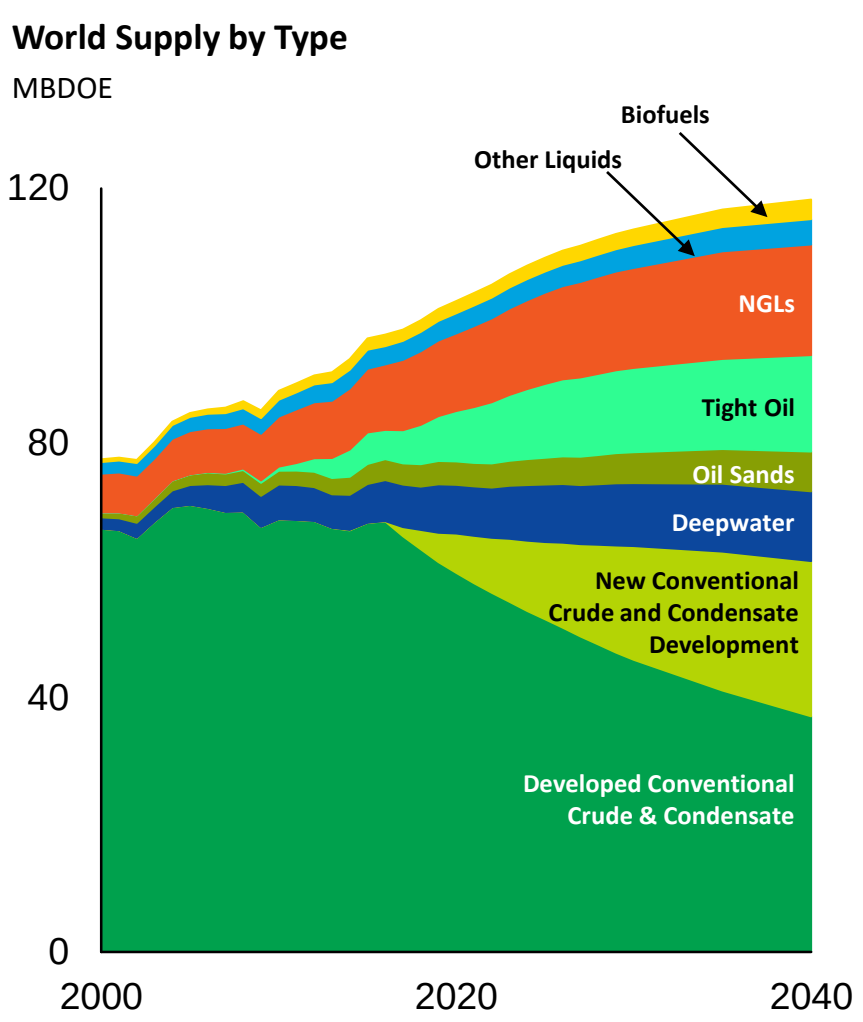
NUCLEAR

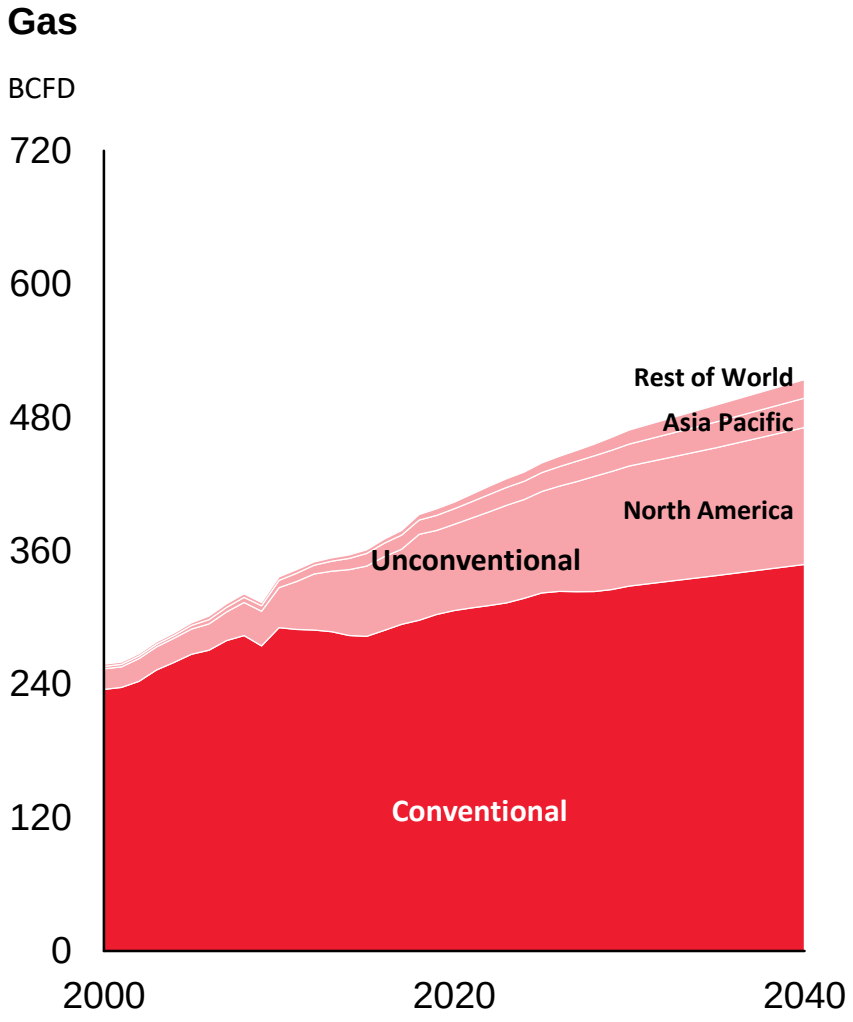
WIND/SOLAR

HYDRO/GEO/BIOFUELS

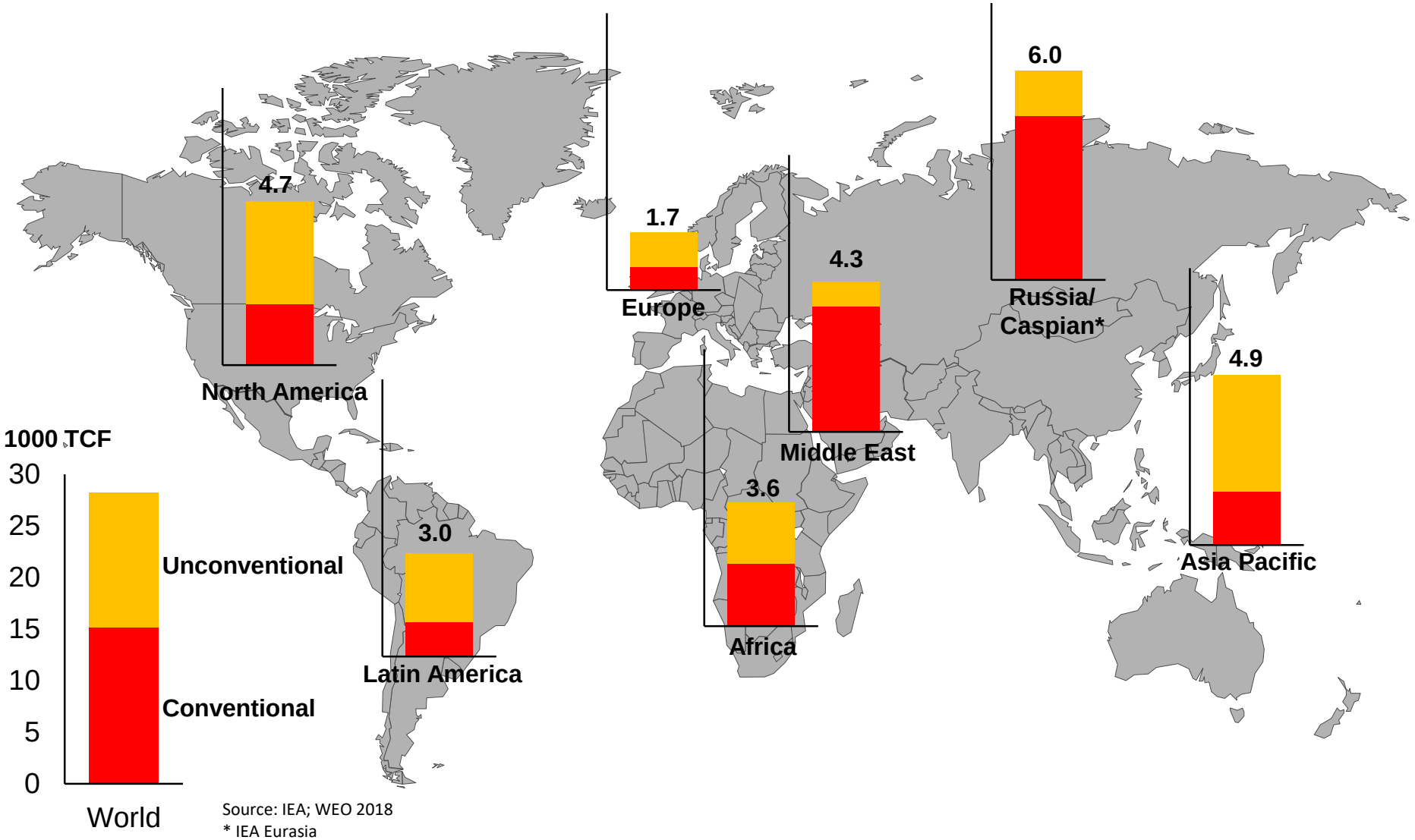


Global Liquids and Gas Supply





Remaining Global Gas Resource

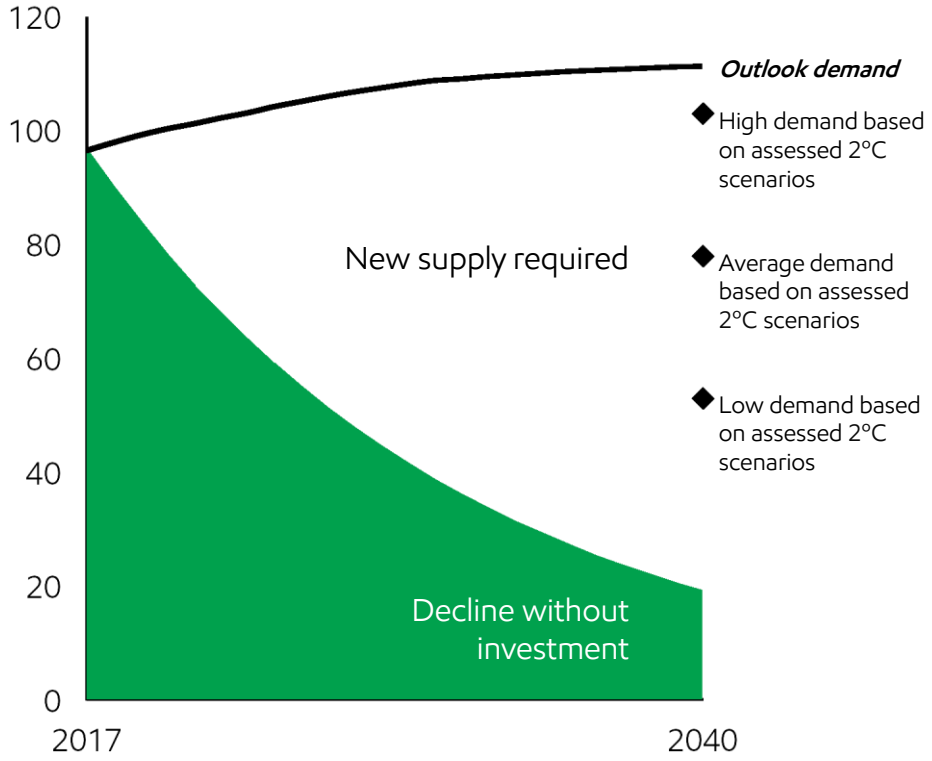


Source: IEA; WEO 2018
* IEA Eurasia

Supply / demand gap warrant investment

Global oil supply and demand

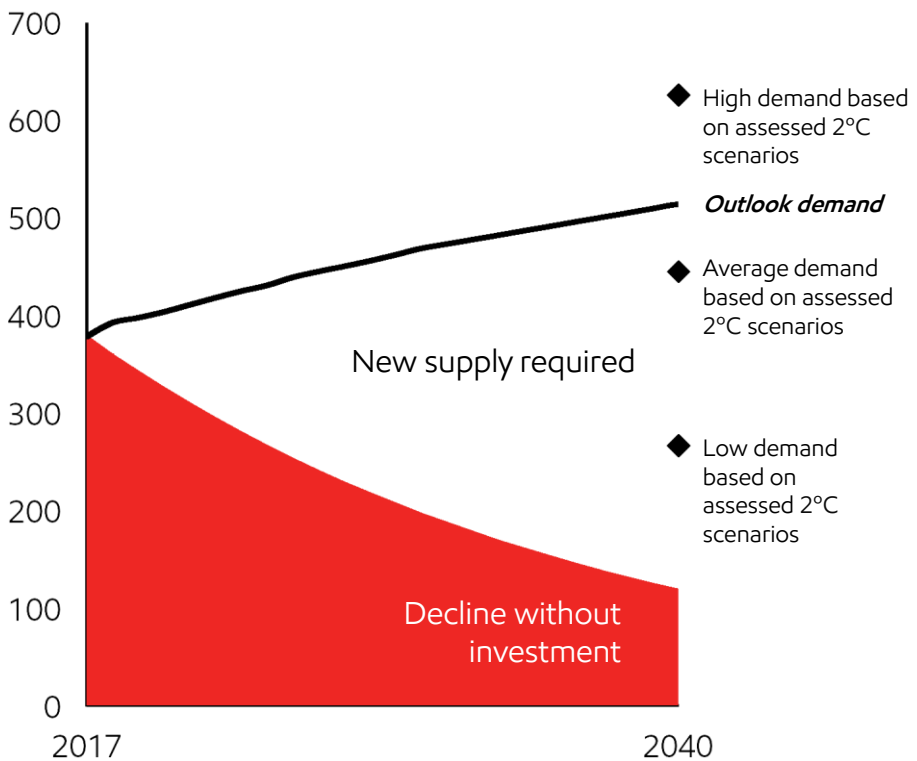
MBDOE



Excludes biofuels; Source: IEA, EM analyses
Assessed 2°C scenarios based on EMF27 full technology/450ppm cases targeting a 2°C pathway

Global natural gas supply and demand

BCFD

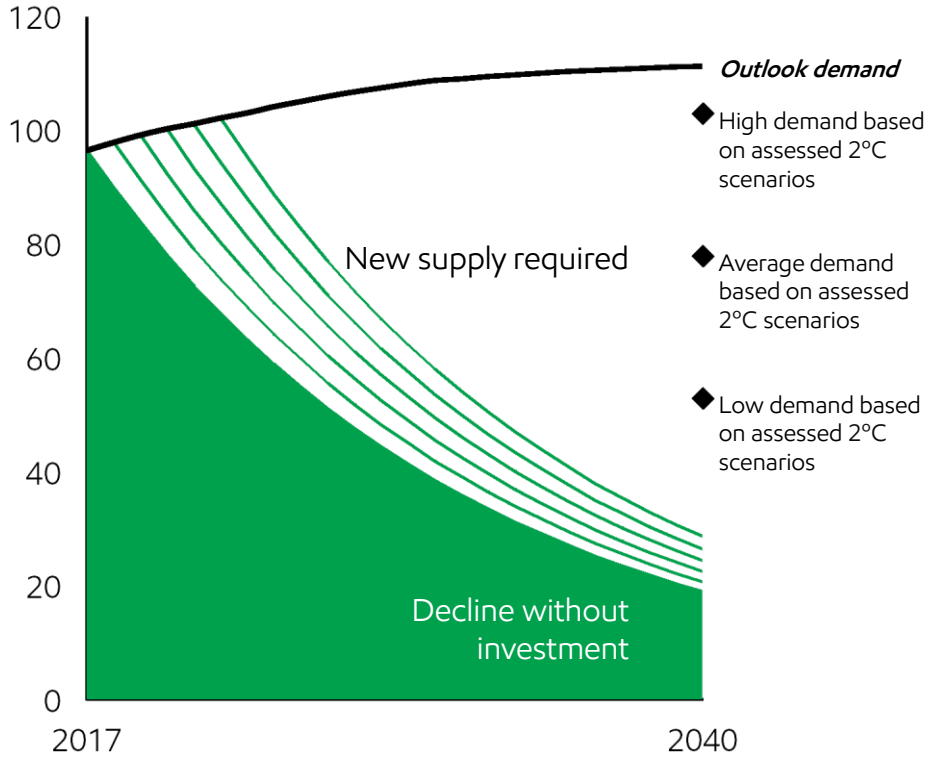


Source: IHS, EM analyses
Assessed 2°C scenarios based on EMF27 full technology/450ppm cases targeting a 2°C pathway

Supply / demand gap warrant investment

Global oil supply and demand

MBDOE



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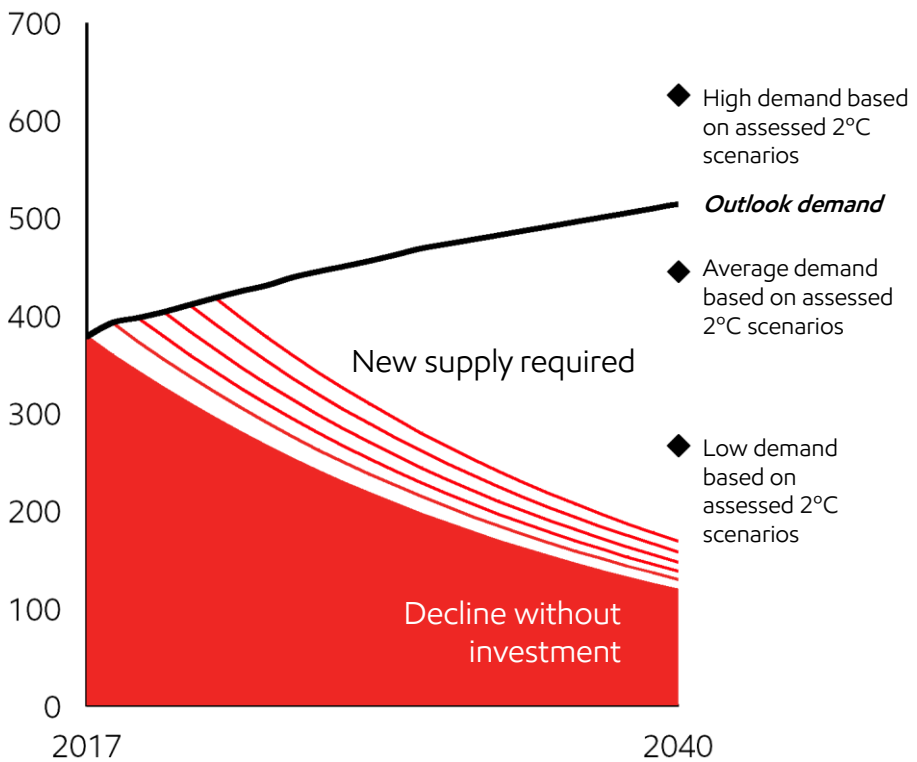


Source: IHS, EM analyses
Assessed 2°C scenarios based on EMF27 full technology/450ppm cases targeting a 2°C pathway

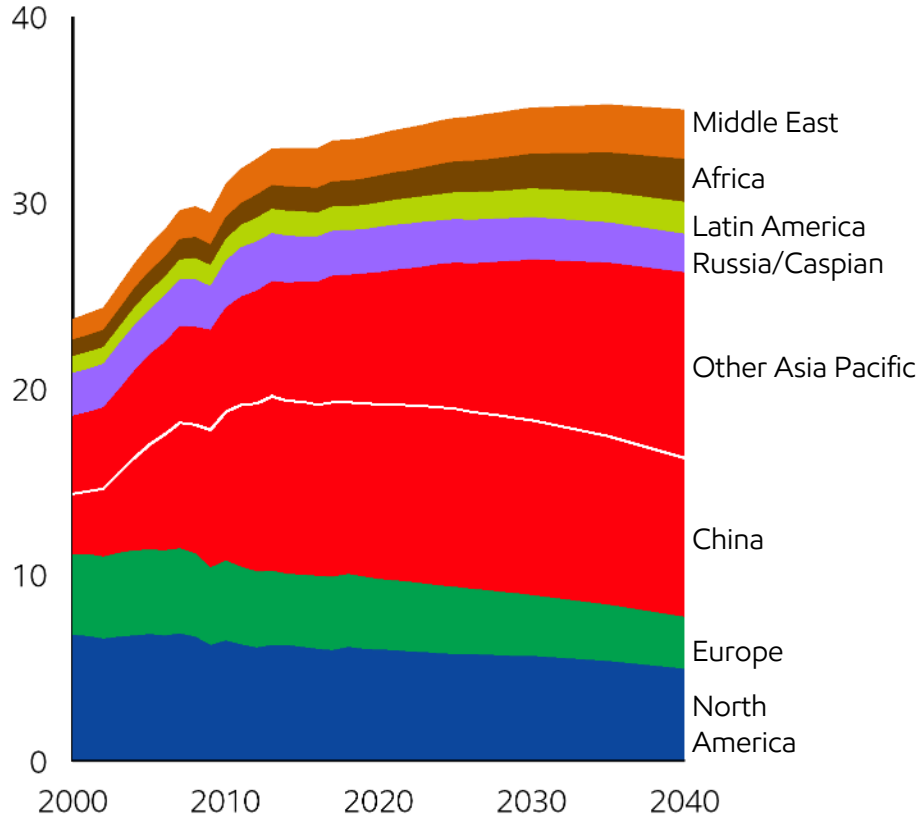
EMISSIONS

Energy-related CO2 emissions projected to peak before 2040

Emissions peak with shift to lower emission sources

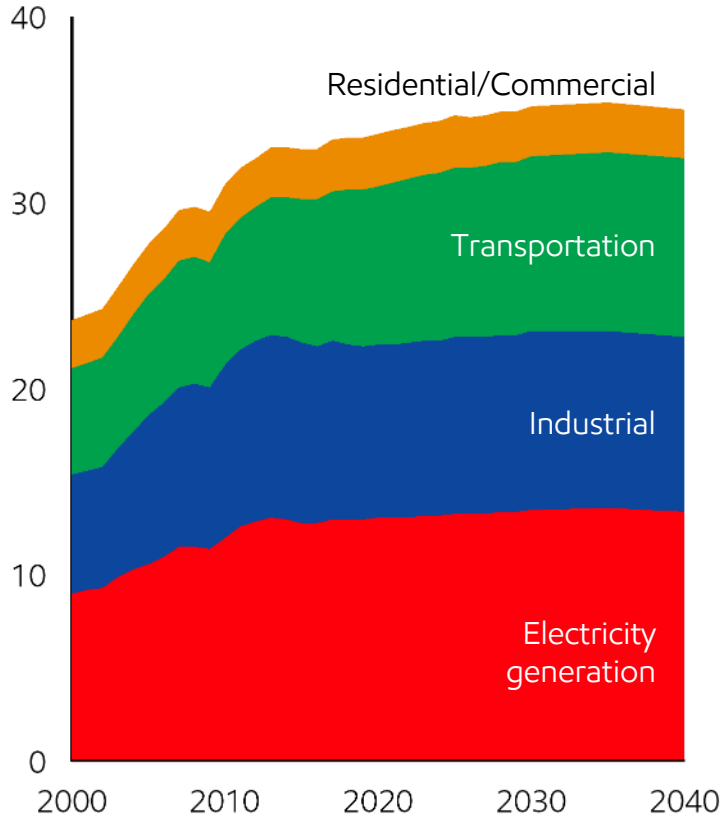
Energy-related CO_2 emissions peak

Billion tonnes

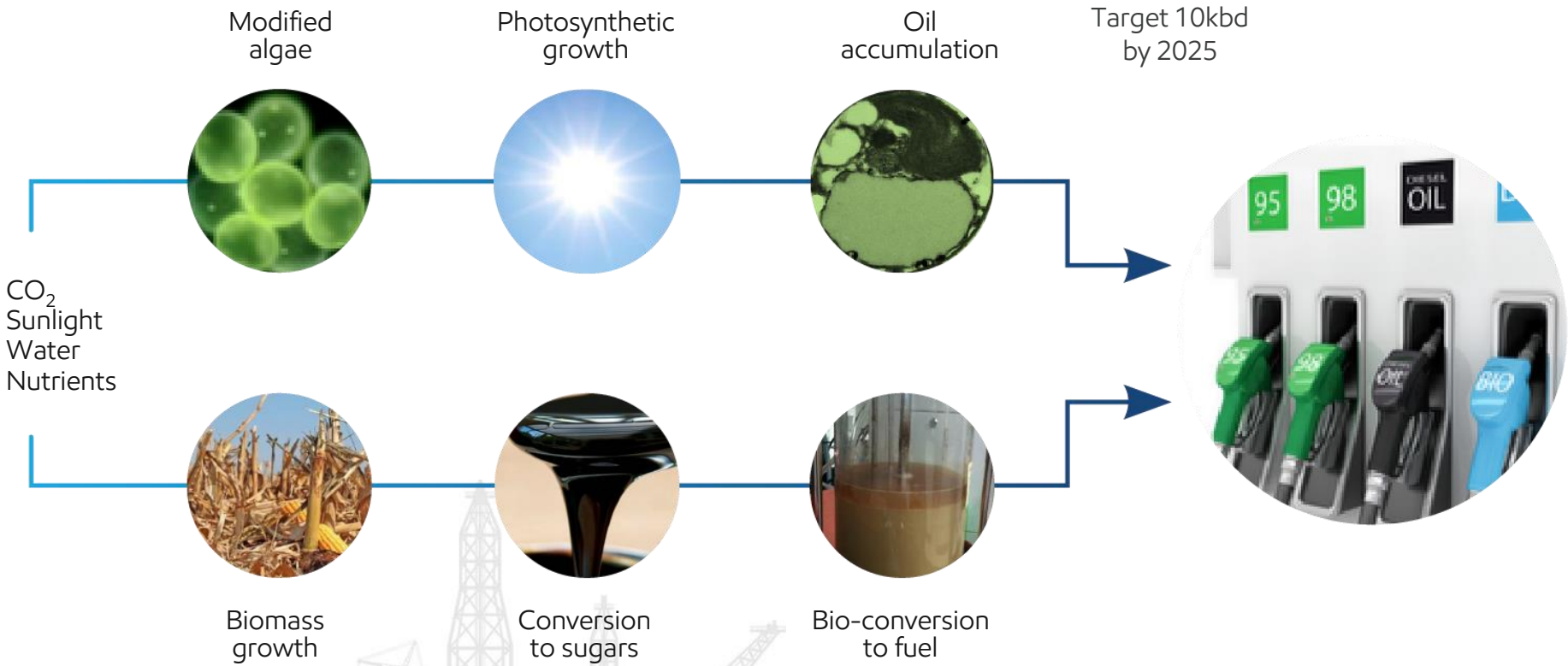


All sectors contributing to restrain CO_2 emissions growth

Global energy-related CO_2 emissions - billion tonnes



Low Emissions Transportation with Advanced Biofuels



Key takeaways from 2040 projections

- **Energy is fundamental for modern life**
- **Global energy demand rises by 20 percent; market demand trends differ for OECD and non-OECD**
- **Global electricity demand rises 60 percent**
- **Almost half of the world's energy is dedicated to industrial activity**
- **Commerce and trade drive transportation energy consumption up more than 25 percent**
- **Global energy related CO_2 emissions peak, but remain above assessed 2°C scenarios**
- **Oil and natural gas remain important energy sources and require significant investment**

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"Governments have a once-in-a-lifetime opportunity to reboot their economies and bring a wave of new employment opportunities while accelerating the shift to a more resilient and cleaner energy future"

Dr Fatih Birol, IEA Executive Director

https://www.iea.org/reports/sustainable-recovery

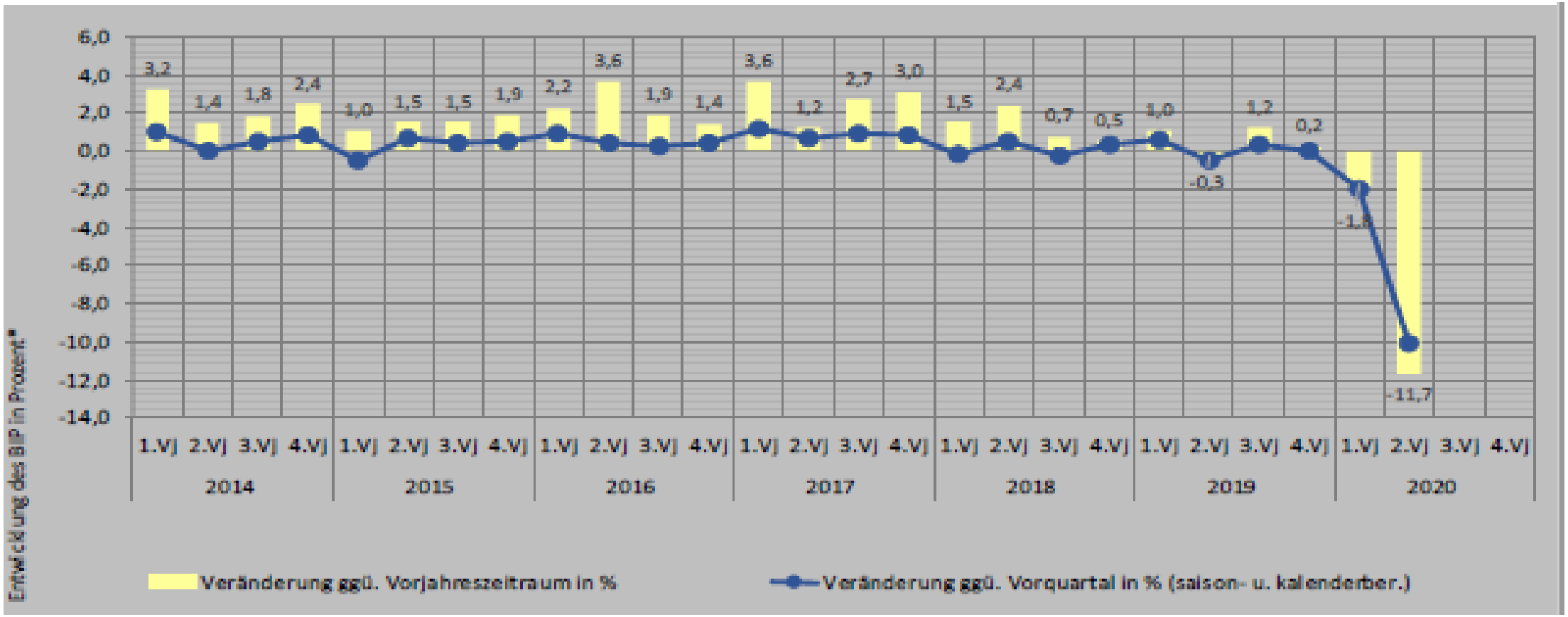
IEA: Covid-19 Impact on Global Economy

- OECD expects the global economy to contract by around 6% in 2020 (no 2nd wave during second-half of 2020)
- **Global energy demand** is estimated to **fall** by around **6% in 2020** relative to 2019.
  - **8% of the 40 million jobs** directly provided by the energy sector are at risk or have already been lost.
  - **Oil demand -8%** on average across the year. Demand in April -25%; expected to pick up as economic activity increases, but a number of uncertainties remain over the speed and magnitude of the rebound (IEA, 2020c).
  - **Natural gas demand -4%;** recent major reduction in gas prices, together with the widespread availability of liquefied natural gas, made it more competitive with coal, including in many Asian countries.
  - **Electricity generation from renewables +5%** in 2020.
- Annual global **CO2 emissions** are expected to fall by around **8% in 2020**, predominantly due to the downturn in economic activity

https://www.iea.org/reports/sustainable-recovery

GDP Germany

Source: AGEB Quarterly Report August 2020

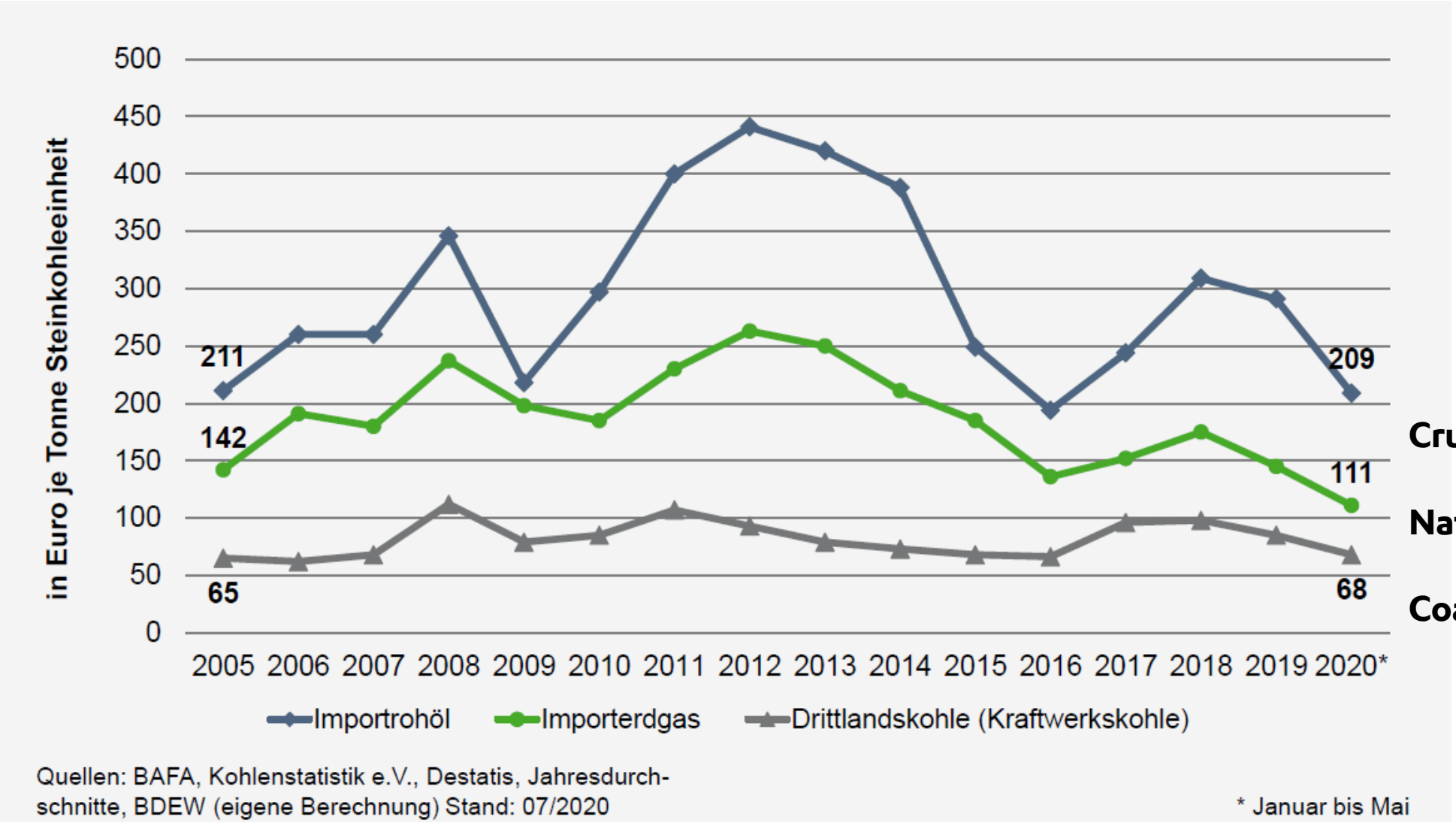


* Statistisches Bundesamt

AGEB
AG Energiebilanzen e.V.

Price History of selective Import Resources

Source: BDEW Bundesverband der Energie-und Wasserwirtschaft e.V.



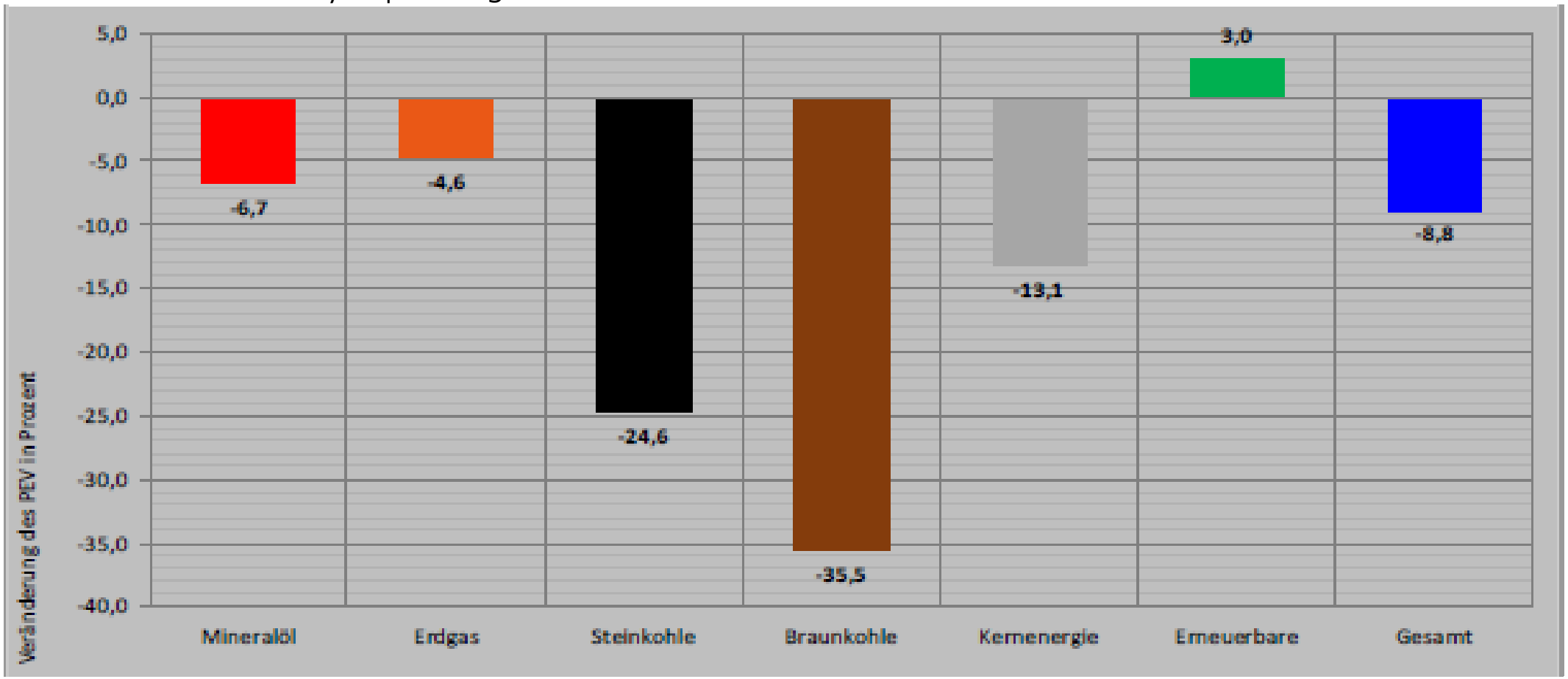
Crude

Natural Gas

Coal

Germany Primary Energy Supply

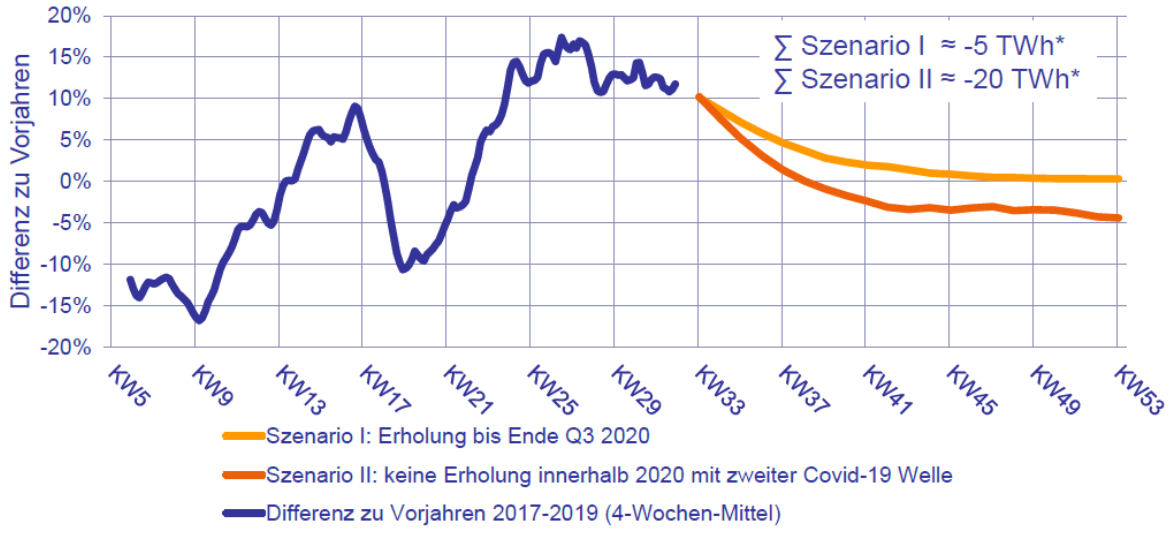
Source: AGEB Quarterly Report August 2020



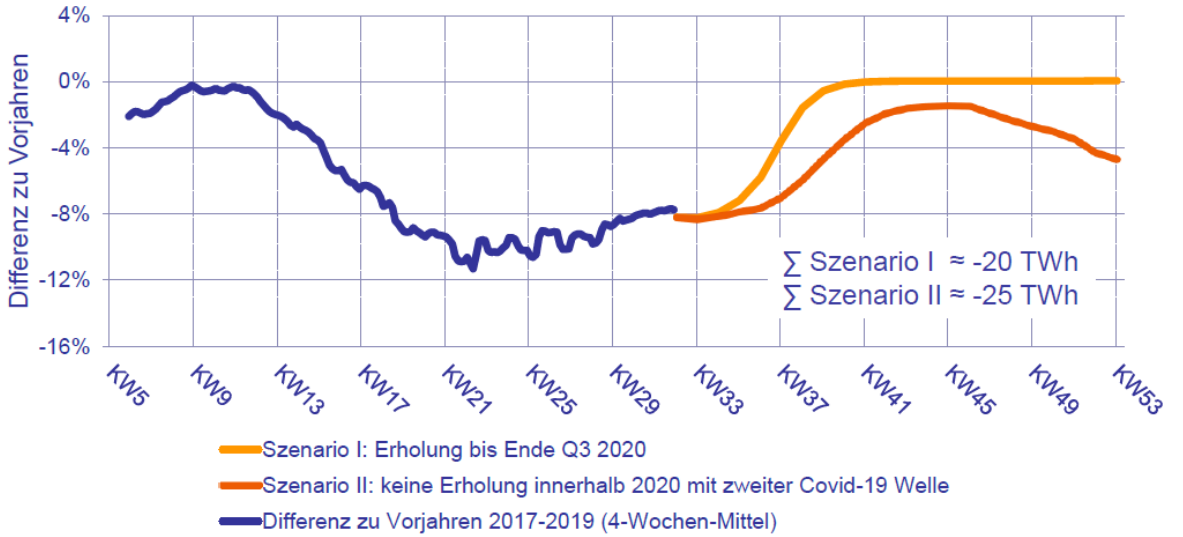
AGEB
AG Energiebilanzen e.V.

Germany Demand of Nat. Gas & Electricity

Source: Team Consult Energiemarktradar 19.8.20



Quellen: NCG, GPL
** Minderverbrauch ab 06/20 in Szenarien nur durch Covid-19 bedingt; d.h. keine Extrapolation des bisherigen temperaturbedingten Minderverbrauchs in 2020*



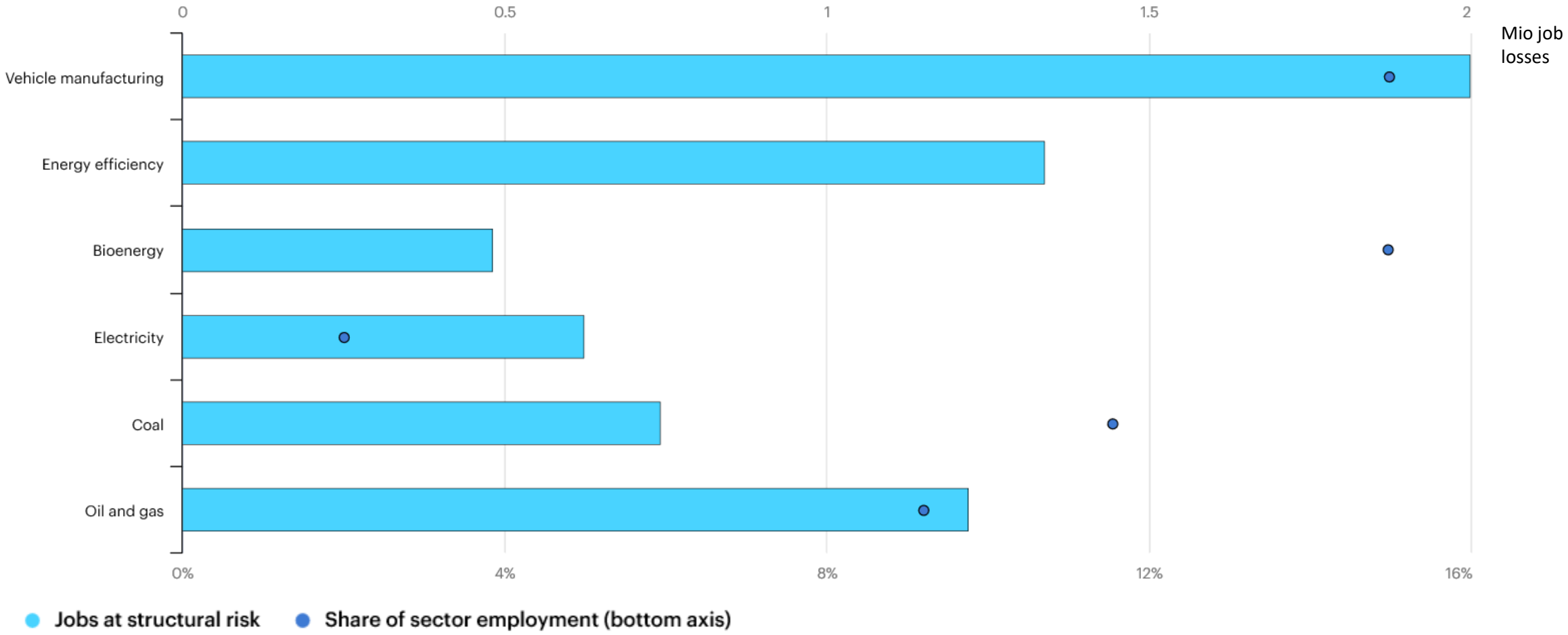
Quellen: ENTSO-E

Die betrachteten Vorjahre sind 2017 - 2019

Scenario I:	Normalisation of energy demand in the third quarter
Scenario II:	Partial normalization of energy demand and renewed tightening of restrictions in the fourth quarter
Comment:	Curves and numbers of scenarios are continuously updated

IEA: Energy sector, energy efficiency and vehicle manufacturing jobs at risk post Covid-19 and share of total sector employment

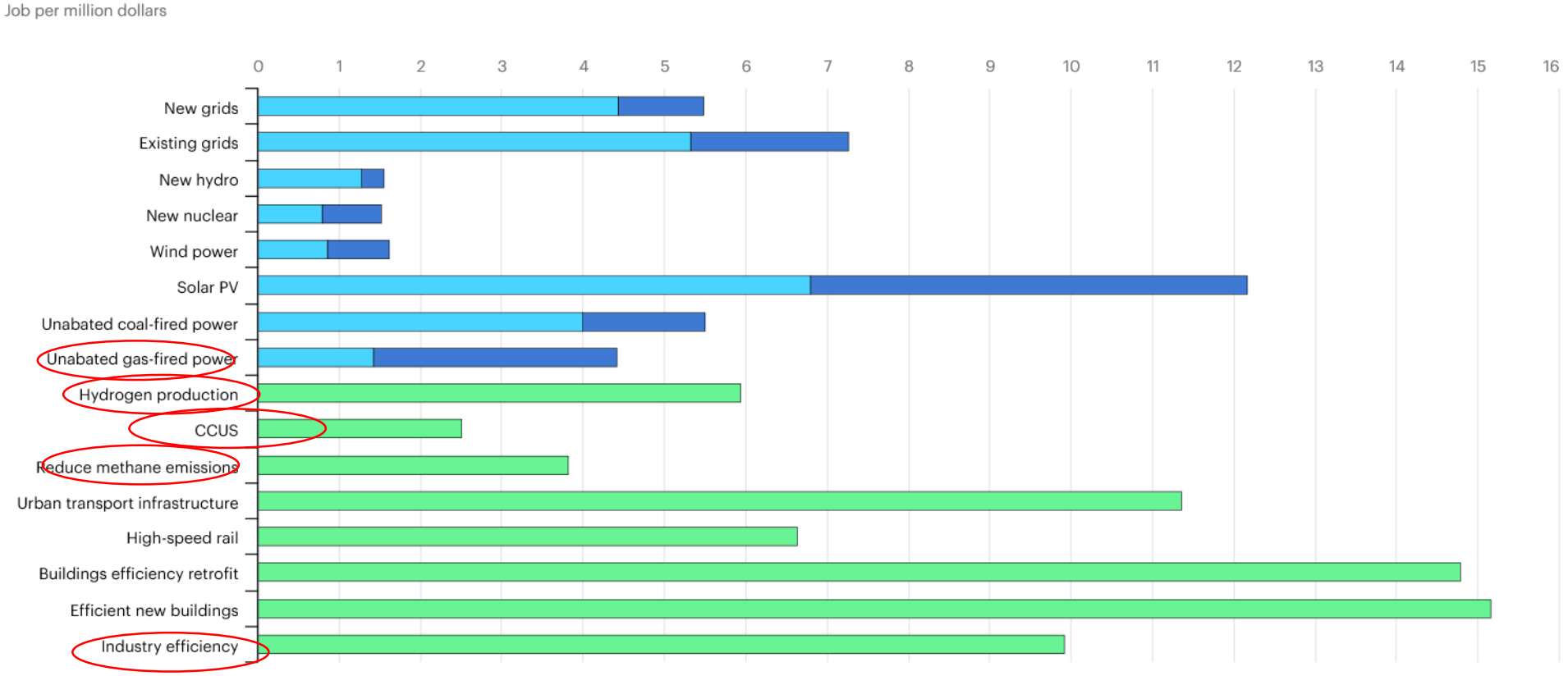
Last updated 17 Jun 2020



https://www.iea.org/data-and-statistics/charts/energy-sector-energy-efficiency-and-vehicle-manufacturing-jobs-at-risk-post-covid-19-and-share-of-total-sector-employment

IEA: Construction and manufacturing jobs created per million dollars of capital investment in the Sustainable Recovery Plan

Last updated 17 Jun 2020



https://www.iea.org/data-and-statistics/charts/construction-and-manufacturing-jobs-created-per-million-dollars-of-capital-investment-in-the-sustainable-recovery-plan

Construction Manufacturing Total