

22nd Edition World Energy Markets Observatory: Global Findings

In pursuit of a "better normal"



Energy demand slowed in 2019, but emissions continued to grow

Energy demand } +0.7% 2019
+2.8% 2018

GHG Emissions historic peak at +0.6%

10%

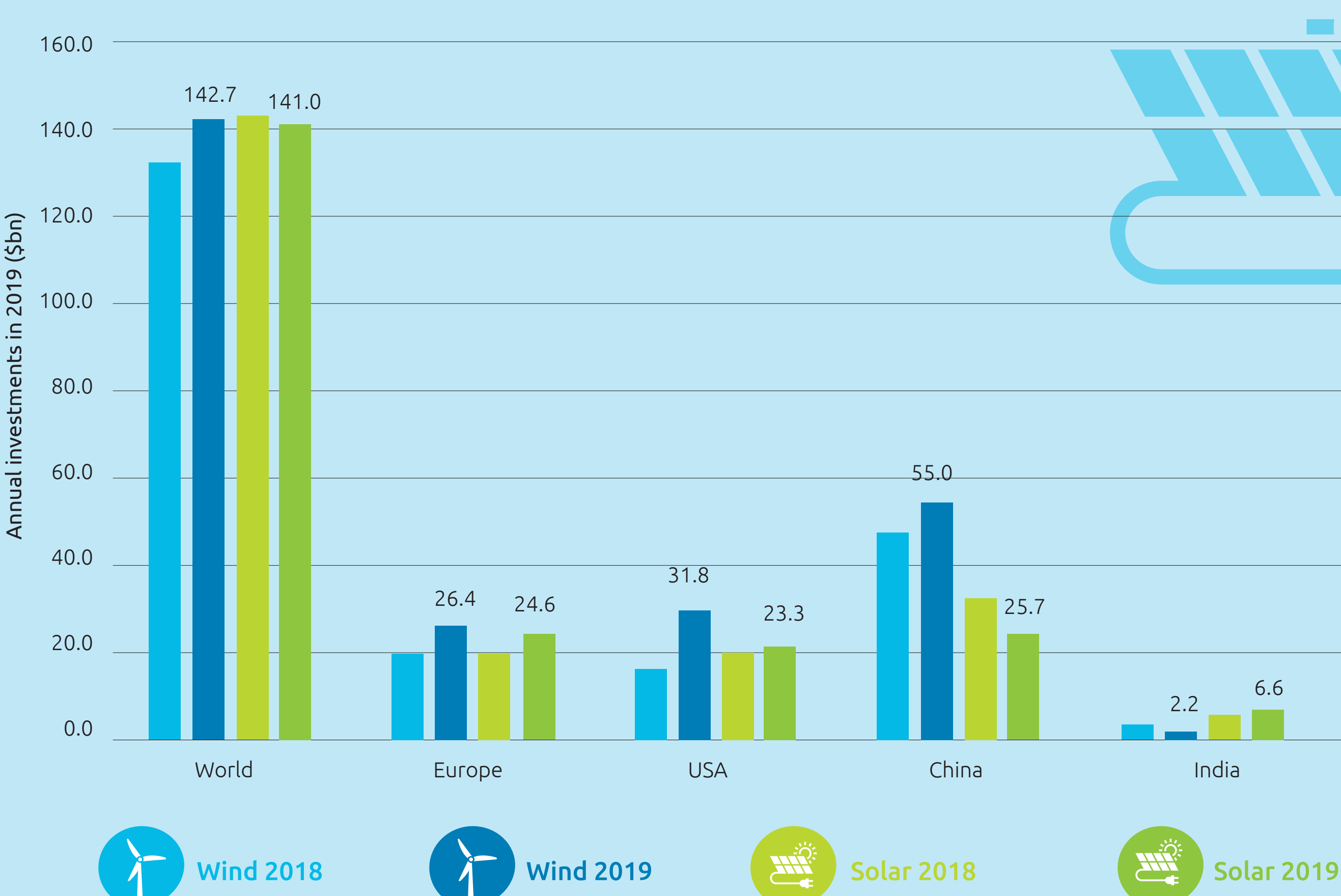
Share of nuclear generation in the world's electricity mix in 2019

Nuclear production is stable but falls short of International Energy Agency recommendations

Global investments in wind & solar energy remain steady at +3%

China's investments in solar have slowed during the past two years, though a rebound is expected.

2018-2019 investments in wind and solar energy



Renewable or "green" hydrogen is a critical new energy carrier for a carbon-neutral future

However, improvements in cost efficiency are needed in order to optimize this promising solution

Green H2
Produced from renewable energy sources

Blue H2

Produced from non-renewable sources but with low CO2 emissions (e.g., CCUS, nuclear)

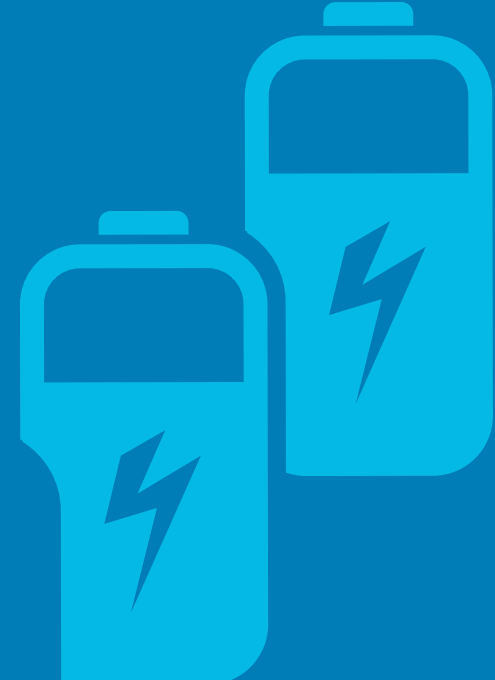
Grey H2

produced from fossil energy sources without carbon capture

3X production cost of Green Hydrogen as compared to Grey Hydrogen in 2019

Batteries are essential to the advancement of intermittent renewable generation

115 new megafactories planned worldwide including 88 in China



Costs -19% 2019/2018

Anticipated capacity: 2632 GWh by 2028

The Impact of COVID-19

The crude price war during March and April, as well as the COVID lockdown, caused a crisis in oil and gas markets.



-30% Oil price drop in March 2020

+ -30% Additional oil price drop Jan-Feb 2020

100mb/d: Oil consumption in early 2020
75-80 mb/d: Oil consumption during the COVID-19 lockdown period

\$64/b: WTI oil prices in early 2020

\$-37.63/b in April 2020

2022: Full recovery of oil prices

8% Projected GHG emissions reduction during 2020 due to COVID-19

However, the decrease is unsustainable. Emissions will likely rise as the world recovers from the pandemic.

With intermittent renewable share in the electricity mix rising above 40% during the lockdown period, grid stability became a concern.



-20% Electricity consumption:

-50% Wholesale electricity prices:

"In this year's World Energy Markets Observatory, we see the need to take a more ambitious and concrete plan to address the dire need for climate action — and COVID may be an unlikely impetus for change. As governments pass economic stimulus bills and recovery packages, it is possible to prioritize "green" initiatives, accelerating energy transition and sustainability goals."

Philippe Vié
Vice President and Sector Head for Energy, Utilities and Chemicals, Capgemini

Accelerate grid modernization through at-scale deployment of the smart grid, enough schedulable generation, storage and increased demand flexibility.

Oil & Gas operators are drastically reducing their CAPEX & OPEX in response to the price war and economic slowdown related to COVID-19.

O&G players invest less than 1% outside the core business — hampering their ability to meet energy transition goals.

European O&G majors invest far more. 50% of non-core investments are dedicated to renewables

Utilities transformation roadmaps must be reconsidered in a post-COVID world.

Energy Transition, Carbon Neutrality
Priority #1



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"Our planet remains far from reaching our global climate objectives. Extension of the 2019 trajectory would lead to a global temperature increase of 3.1-3.7°C by 2050—well above the 1.5-2°C threshold experts recommend. This year's World Energy Markets Observatory makes the case for why the sector must act—and what the best path forward may be."

Colette Lewiner
Senior Energy Adviser to Capgemini Chairman

About WEMO

The World Energy Markets Observatory (WEMO) is Capgemini's annual thought leadership and research report that tracks the development and transformation of electricity and gas markets in Europe, North America, Australia, Southeast Asia, India and China. Now in its 22nd edition, WEMO examines the following topics: climate change & regulatory policies; energy transition; infrastructure & adequacy of supply; supply & final customer; transformation; financials; and, for the first time, the oil & gas industry. This edition also includes data and analysis for the first half of 2020 due to the extraordinary events related to COVID-19.

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