

No 4 | May 12, 2021

News Analysis

IEA global energy review



IEA global energy review

*By Dr. Charles Ellinas**

The International Energy Agency (IEA) published its 'Global Energy Review 2021' [report](#) in April. This was complemented in May by a [special report](#) on the 'Role of Critical Minerals in Clean Energy Transitions'. Both make very interesting reading, also providing some timely warnings.

The key conclusions are that:

- Global energy-related carbon dioxide (CO₂) emissions are expected to increase by almost 5%, or 1.5 billion tonnes CO₂, in 2021, mostly due to increases in coal demand
- Global energy demand is also expected to increase by 4.6% in 2021 – in line with 6% rebound in global economic output - recovering 2020 reductions and rising above 2019 levels, led by emerging markets and developing economies
- Renewables are set to provide 30% of electricity generation globally, increasing by 8% in 2021, with China in the lead
- In the transition to clean energy, critical minerals bring new challenges to energy security. Today's mineral supply and investment plans fall short of what is needed to transform the energy sector, raising the risk of delayed or more expensive energy transitions. New and more diversified supply sources will be vital to pave the way to a clean energy future.

Fatih Birol, IEA's executive director, said "This is a dire warning that the economic recovery from the Covid crisis is currently anything but sustainable for our climate...Unless governments around the world move rapidly to start cutting emissions, we are likely to face an even worse situation in 2022...This is a critical moment to commit to clear and immediate action ahead of COP26 in Glasgow."

Global energy demand

Sustained economic recovery from Covid-19 is bringing about a reversal in last year's decline in global energy demand. This is now expected to increase by 4.6%, led by emerging markets and developing economies, with both coal and natural gas consumption set to rise above 2019 levels.

China is expected to account for over 50% of the increase in coal consumption. While it is making major commitments towards clean energy, China is still carrying on burning coal, accounting for over 50% of the world's consumption. Its 14th Five-Year-Plan (FYP) covering the period 2021-2025, approved in March, provides for the continued use of coal over the period, with 250GW of new coal-fired power plants are under development - more than the entire generating capacity of the US – promising peaking emissions only

by 2030. What is astonishing is that the expected rise in coal consumption in 2021 dwarfs that of renewables by almost 60%.

Natural gas demand is projected to rise by 3.2% globally in 2021 - 1.3% above 2019 levels - led by Asia, but also the Middle East and Russia. Most of this is driven by industry and buildings, with electricity generation from natural gas remaining below 2019 levels, squeezed by the growth in renewables. But, according to the IEA, uncertainties regarding industrial rebound and gas price competitiveness mean that "recovery remains fragile."

Global oil demand in 2021 should recover about 5.4million b/d of the 8.5million b/d loss in demand in 2020 due to the impact of Covid-19 on the global economy and travel. But it is likely to return back to pre-Covid-19 levels by 2022. Again, this is led by China, where demand in 2021 is expected to grow by about 9% above 2019 levels.

But with oil demand increasing, Rystad Energy is warning that oil reserves could run-out within 15 years if new, large, commercial discoveries are not made quickly.

Global electricity demand is on the way to grow by 4.5% by the end of 2021, greater than at any time over the last ten years, with China accounting for half of this. Electricity's share of global final energy demand is expected to exceed 20% for the first time.

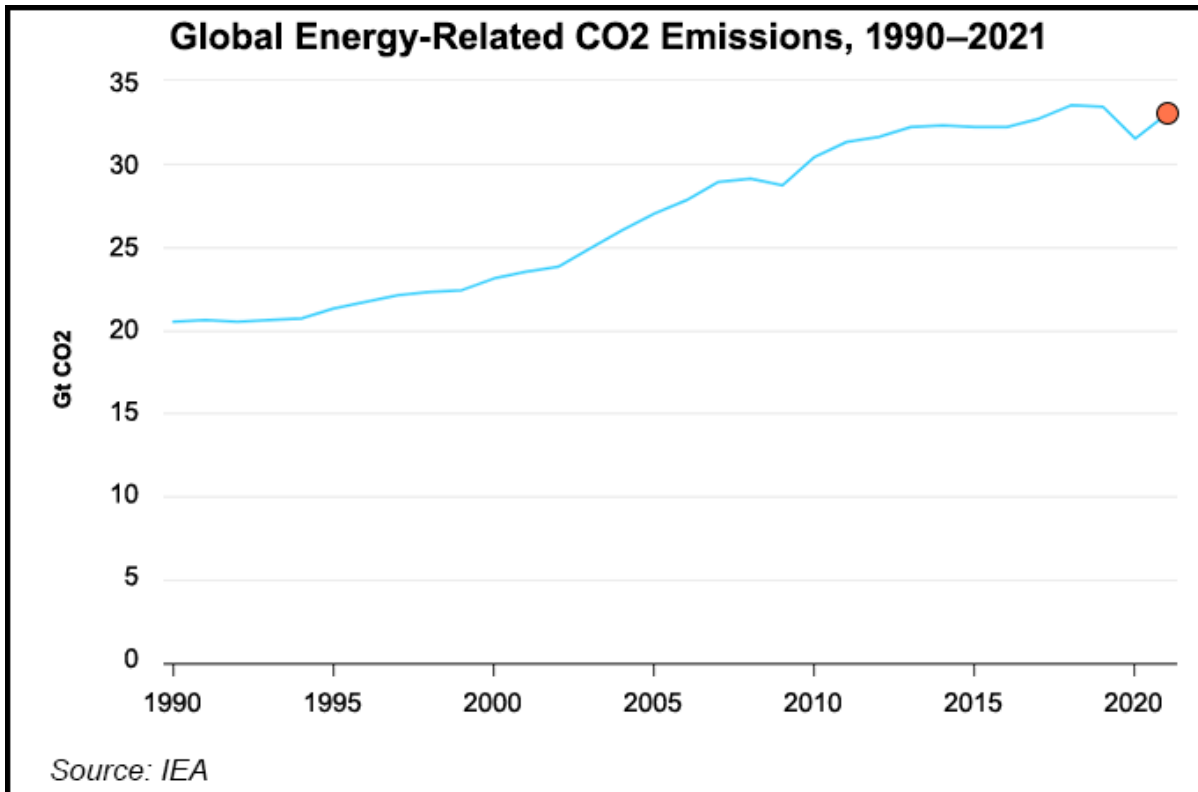
The greatest contribution to this is from renewables, set to grow by more than 8%, with solar and wind contributing about two-thirds of this growth. The share of renewables in electricity generation will reach 30% in 2021. China accounts for about half of this growth, with the US following behind.

Carbon emissions

Most of the gains in 2020, when CO2 emissions declined by almost 2billion tonnes, will be lost, with 2021 ending just 1.2% below 2019 levels. About half of the overall improvement in global emissions in 2020 resulted from a reduction in the use of oil for road transport and aviation. But according to the IEA, a full recovery of global transport activity would push oil-related emissions back up.

The increase in carbon emissions in 2021 is expected to be the largest over about the last ten years, increasing by 5% (Figure 1). This follows the rebound in coal, oil and gas demand as economic recovery picks up pace in 2021.

Figure 1: Global energy-related CO2 emissions, 1990-2021



<https://www.naturalgasintel.com/iea-cautions-co2-emissions-to-spike-in-2021-as-global-economy-emerges-from-pandemic/>

The increase in CO2 emissions in China alone is expected to be 6% above 2019 levels> it will also be 1.4% higher in India. With less coal and more gas and renewables, US emissions should remain 5.6% below 2019 levels. With a dimmer economic outlook, emissions in the EU are likely to rebound less.

Overall, non-developed economies now account for more than two-thirds of global CO2 emissions, while emissions in advanced economies are in structural decline, despite the anticipated rebound in 2021.

China’s emissions, now at 27% of the world total, exceed the combined emissions of all advanced economies. US is the second largest with 11%, with India third at 6.6% and EU fourth at 6.4%.

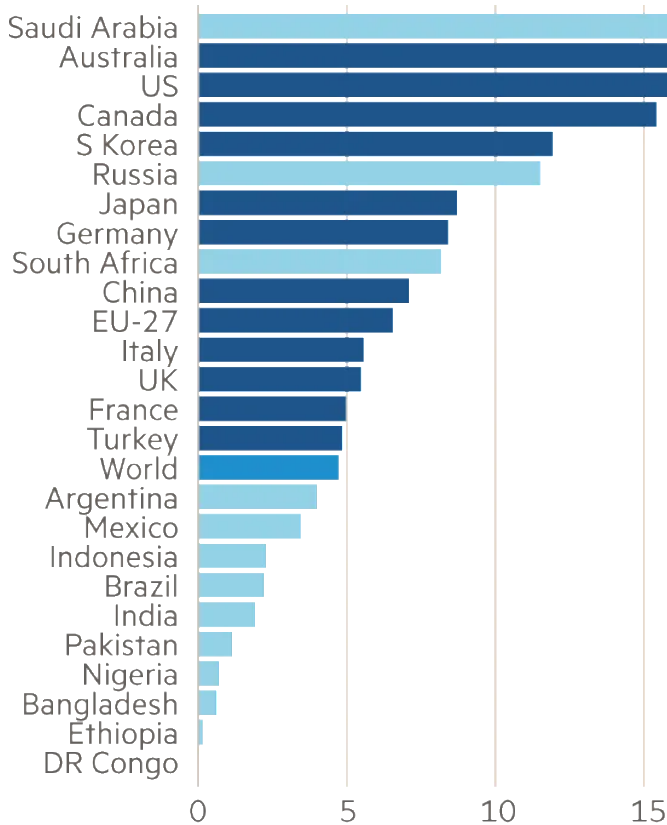
However, on a per-capita basis CO2 emissions from advanced economies still top global ranking, with all emitting above the world-average (Figure 2).

Figure 2: CO2 emissions per-capita across the world

There is an enormous range of emissions per head across the world

CO₂ emissions per head, 2019 (tonnes)

■ Advanced ■ Emerging & developing



Source: Our World in Data based on data from Global Carbon Project, UN
© FT

https://ecp.yusercontent.com/mail?url=https%3A%2F%2Fwww.ft.com%2F_origami%2Fservice%2Fimage%2Fv2%2Fimages%2Fraw%2Fhttps%253A%252F%252Fip-ep-ftcom-manual.s3.eu-west-1.amazonaws.com%252F6d309910-35a6-4730-a78a-e8d0278a5da7%3Fsource%3Dip-ep-eme-api%26width%3D700%26fit%3Dscale-down&t=1620225420&ymreqid=e6bccf60-b840-14be-1c9c-fb0d9501a500&sig=yoltFdGO0deTYd4tyxXCKw--~D

On a per-capita basis, China is catching up, now above the EU average and approaching 50% of US per-capita emissions. But India is still very low, at about only one-tenth of the US.

Nevertheless, Figure 1 gives credence to the view that when it comes to planning future reductions in emissions, advanced economies must lead by example. As Birol said “in the absence of major and immediate policy changes in the world’s largest economies, global emissions will continue to increase.”

Mineral supply

All new technology required to support renewable and clean energy applications requires more minerals than conventional energy sources do. As the IEA points out, “a typical electric car requires six times the mineral inputs of a conventional car and an onshore wind plant requires nine times more mineral resources than a gas-fired plant.”

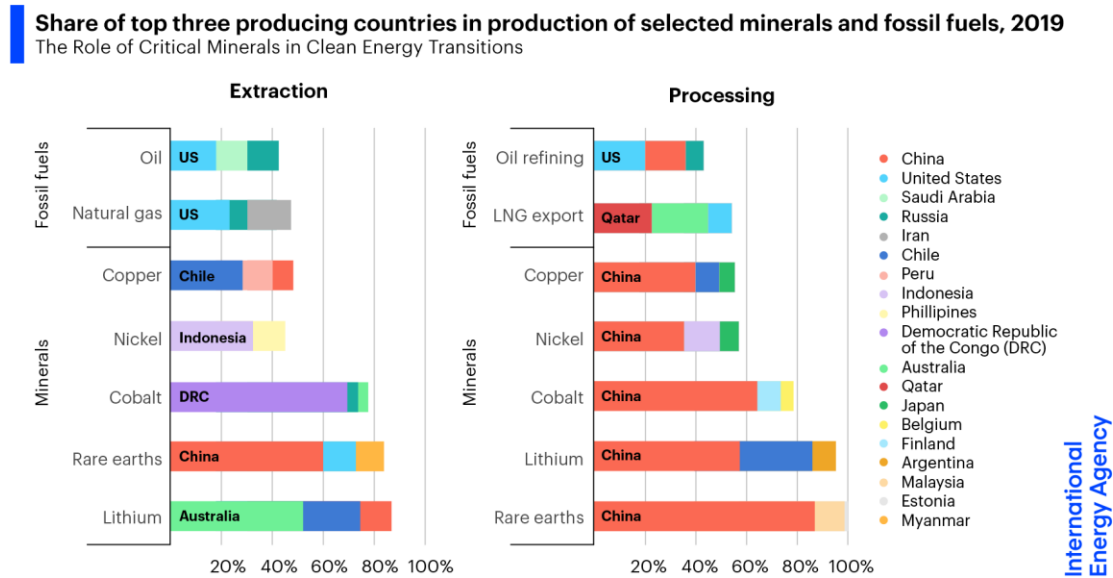
As energy transition gathers pace, clean energy technologies are growing fast, putting increasing pressure on mineral resources and markets.

According to the IEA, “in a scenario that meets the Paris Agreement goals, their share of total demand rises significantly over the next two decades to over 40% for copper and rare earth elements, 60-70% for nickel and cobalt, and almost 90% for lithium. EVs and battery storage have already displaced consumer electronics to become the largest consumer of lithium and are set to take over from stainless steel as the largest end user of nickel by 2040.”

The IEA estimates that mineral requirements to achieve net-zero emissions by 2050 “would require six times more mineral inputs in 2040 than today.”

The rising importance of these minerals means that energy policies must consider availability, cost, investment requirements, vulnerabilities and security of supplies, especially of the more critical minerals. China, for example, controls nearly 90% of rare earth elements (Figure 3). The IEA states that production of critical minerals needed for clean energy technologies was much more concentrated than in the oil market. It is then not strange that security of mineral supply is gaining importance in energy security debate.

Figure 3: Share of top three producing countries in production of selected minerals and fossil fuels



<https://pbs.twimg.com/media/E0mUwchXEAQb7eX?format=png&name=large>

As Birol pointed out, "today, the data shows a looming mismatch between the world's strengthened climate ambitions and the availability of critical minerals that are essential to realising those ambitions."

Without appropriate planning and action, energy transition risks being delayed by availability and increasing costs of critical minerals and supply disruptions.

Implications

Developments in 2021 – with demand for all fossil fuels growing significantly - to a certain extent confirm what Frans Timmermans, European Commission vice-president, said earlier in the year: "Where, and as long as, clean energy cannot yet be deployed on the scale needed, fossil gas may still play a role in the transition from coal to zero emission electricity." Something similar of course also applies to transport and oil. And India and China argue they are not yet ready to wean themselves from coal - they may need the rest of this decade to achieve this.

But as Birol said early May, the current situation is "shocking and very disturbing. On the one hand, governments today are saying climate change is their priority. But on the other hand, we are seeing the second biggest emissions rise in history. It is really disappointing."

Nevertheless, the march towards clean energy and renewables, and eventually net-zero, is an one-way street. Setting up targets and striving to achieve them is now accepted globally - nearly 200 countries have endorsed the Paris Agreement. The additional commitments made at the Leaders Summit on Climate hosted by US President Joe Biden end of April, that included China and India, are a good indication of this. But these can become effective only if rhetoric is backed-up with credible policy actions. And that is where the challenge lies.

**** Senior Fellow, Atlantic Council, UK and Visiting Research Fellow at IENE***

IENE - NEWS ANALYSIS - Issue No. 4 – May 12, 2021 – ISSN:179-9163

News Analysis is published by the INSTITUTE OF ENERGY FOR SOUTH-EAST EUROPE (IENE)

3, Alex. Soutsou st. 106 71 Athens, Greece, T: +30-210 3628457, 3640278, F: +30 210 3646144, marketing@iene.gr,

www.iene.eu

© 2021 Institute of Energy for South East Europe All rights reserved. No part of this publication may be reproduced, scanned into an electronic retrieval system, or transmitted in any form or by any means, including photocopying and recording, without the written permission of the publish.