



## **IENE Briefing Note No.21**



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**This Briefing Note is authored by Dr Charles Ellinas, Senior Fellow – Global Energy Center, Atlantic Council, USA and Visiting Research Fellow of IENE**

### **IENE Briefing Notes**

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Institute of Energy for South East Europe (IENE)  
3, Alexandrou Soutsou, 106 71 Athens, Greece  
tel: +0030 210 36 28 457, 3640 278, fax: +0030 210 3646 144  
website: [www.iene.eu](http://www.iene.eu), e-mail: [secretariat@iene.gr](mailto:secretariat@iene.gr)

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## Review of world energy

*By Charles Ellinas \**

During the last two months two major reports were released reviewing world energy. First was Energy Institute's 'Statistical Review of World Energy 2024' published in June, followed by BP's 'World Energy Outlook 2024' published in July. The two reports are "instrumental in providing comprehensive data on global oil, gas and coal production and consumption, as well as on carbon dioxide emissions and renewable energy." Together they provide a comprehensive picture of where world energy is and where it is going.

### Statistical Review of World Energy

According to the Review, global primary energy demand is increasing faster than many hoped. It increased by 2% in 2023, higher than the 1.4% average during the previous 10-years. Even though renewables provided 44% of this growth, fossil fuels provided the remainder.

The contrast between developed and developing countries is stark. In 2023, primary energy demand actually declined by more than 1.5% in OECD countries, but increased by a staggering 4.3% in non-OECD countries, with fossil fuels providing close to 80% of this growth.

In fact, fossil fuels provided about 84.5% of primary energy demand in non-OECD countries despite the rapid growth in renewables. Solar and wind provided less than 6.6% of primary energy demand in non-OECD countries, even after growing by 18% in 2023.

In addition, energy efficiency has been weaker than anticipated. During the last four years, it has been growing by just 1% per year, in comparison to the 4% rate envisioned by the Paris Agreement.

Evidently, during energy transition oil and gas will continue to be important to the global energy mix, especially as the penetration of renewables in sectors other than electricity is very low, and more so in Asia and Africa. Globally, electricity demand grew by 2.5% in 2023, much the same as in 2022, and comprised 17.4% of global primary energy demand, only marginally up on the 17.3% in 2022. At this rate, energy transition will be a long-drawn process.

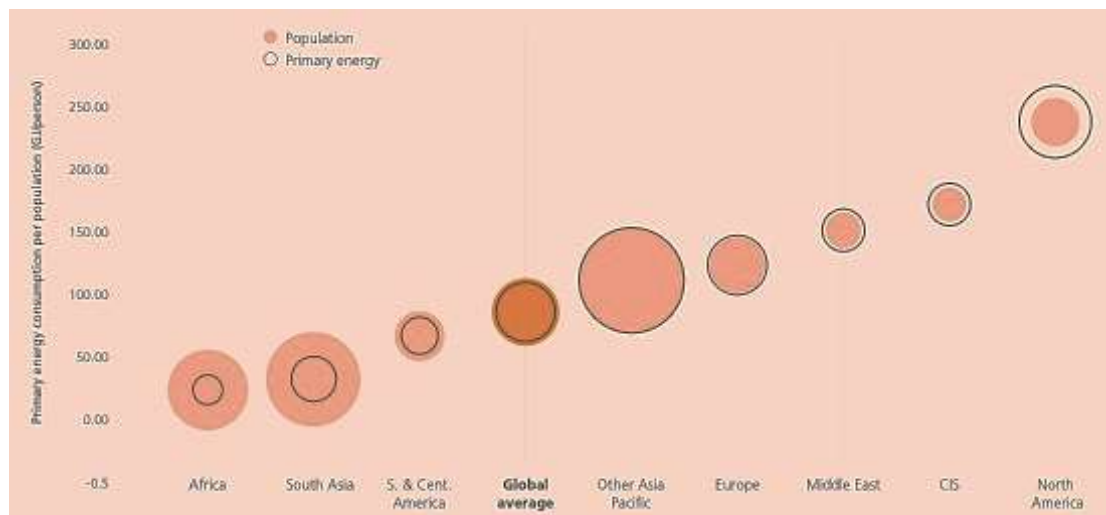
Investments in renewables and the growth in low-carbon electricity generation are thriving. But, so far, renewable energy sources have been unable to cope with rising energy demand on their own.

Clearly, maintaining oil and gas reserves and production to support this demand is critical to global energy security. The oil and gas majors have been making this point for a while, but it is important to now see international banks and lenders coming to a similar conclusion.

Global energy demand carries on growing, driven by non-OECD countries, and while this is happening, as EI's Review has shown, the world will need all the energy it can get.

The Review states that in 2023 the average amount of energy consumed per person in Africa, South Asia, and Southern & Central America, comprising 48% of the world's population, was 30 Gigajoules (GJ), about 27% the global average of 110 GJ/person (*Figure 1*).

**Figure 1: Energy consumption per person, 2023**



Source: Energy Institute 2023 'Statistical Review of World Energy'

<https://www.energyinst.org/statistical-review>

The populations of these countries are increasing and by 2050 they are expected to comprise 61% of the world's population. They also aspire to better living standards, which means their energy consumption will inevitably get closer to the global average. Even if their energy use only doubles to 60 GJ/person, this would lead to global energy use increasing by 35% by 2050.

These factors alone explain why global energy demand will carry-on growing, dominated by non-OECD countries, with renewables alone not being able to provide it.

On that basis, the notion that oil and gas demand would peak in 2030, as the International Energy Agency (IEA) claims, looks unlikely. To a large extent, the impact of increasing EV penetration is expected to be offset by petrochemical demand growth.

Such factors are more often than not glossed over in climate change debates, but they will not go away – it's reality. Even the IEA, a strong advocate of transition to clean energy, recognizes that this will lead to "significant energy demand growth in the future." This poses the biggest challenge to the arguments of climate change activists.

These are also the reasons why oil and gas companies, such as Shell and BP, and now banks, have been backtracking on energy transition commitments and are increasing their oil and gas investments.

### **World Energy Outlook**

Much in agreement with IEA's Statistical Review, the key conclusion from BP's Outlook is that low-carbon energy sources are not growing quickly enough to keep up with global demand.

Apart from the scenario exploring what needs to be done to achieve net-zero by 2050, BP considered the 'Current Trajectory', which is designed to capture the broad pathway along which global energy systems are currently travelling. I will concentrate on this, because the net-zero scenario prescribes an end-result and works backwards on what needs to be done to achieve it. As such, it is an aspiration rather than reality. But the two scenarios can also be compared to give a clearer sense of what needs to be done to shift the world from its current high emissions trajectory to a low-emissions pathway.

BP states that "the world is in an 'energy addition' phase of the energy transition in which it is consuming increasing amounts of both low carbon energy and fossil fuels." This is driven by population growth, prosperity and living standard improvements in non-OECD countries, as well as demand driven by cooling needs and the voracious energy needs of AI data centers.

As Spencer Dale, BP's chief economist, said "the challenge is to move, for the first time in history, from the current energy addition phase of the energy transition to an 'energy substitution' phase, in which low carbon energy increases sufficiently quickly to more than match the increase in global energy demand, allowing the consumption of fossil fuels, and with that carbon emissions, to decline." There is no evidence of that happening yet, but most attending BP's presentation expect the move to start in the second half of the 2030s.

But as Spencer Dale said “the world has never reduced its consumption of any fuel on a sustained basis. It's just consumed more of everything.” This is still the case.

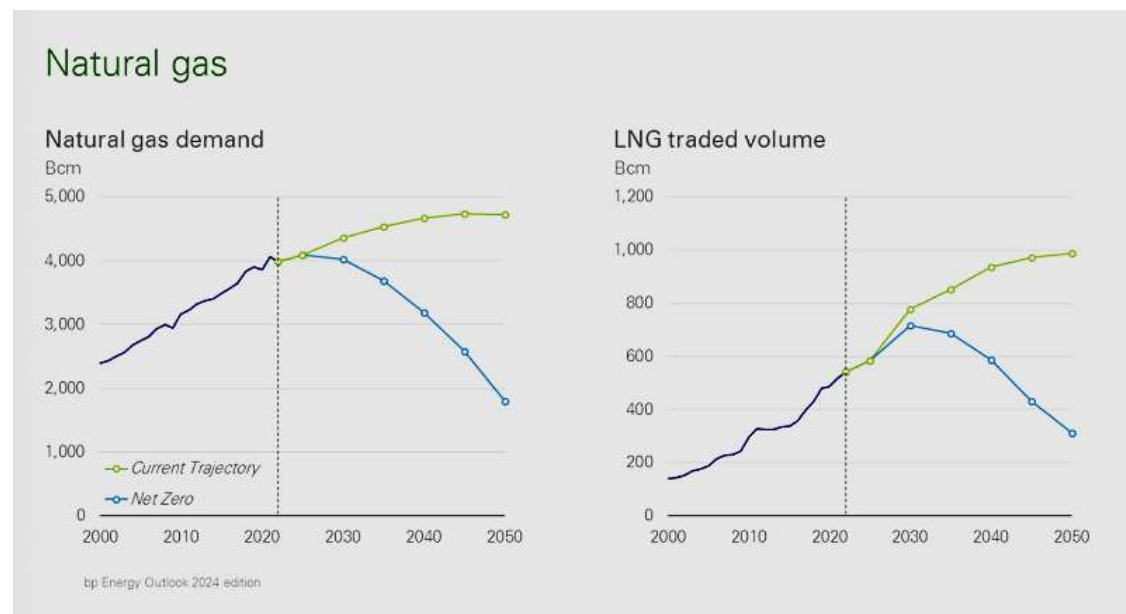
BP stresses that any successful and enduring transition needs to address all three elements of the trilemma: energy security, affordability and sustainability, and the economic and social costs they entail.

Spencer Dale said that “current energy security concerns focus attention to the benefits of domestically produced energy, or obtaining energy from resilient, trusted, and diversified resources.”

Based on ‘current trends’ oil demand carries-on growing, peaking during this decade at 102 million b/d and then gradually declines to about 77million b/d by 2050. But, in reality, based on IEA’s June Oil Report, this peak has already been exceeded. This supports other Outlooks, such as Goldman Sachs, that show oil demand peaking later, in the 2030s and then plateau, rather than decline sharply. Even BP’s Outlook shows oil demand to remain at high levels well into the 2030s.

In contrast, natural gas demand grows throughout the Outlook, expanding by around 20% by 2050, driven by a 50% demand growth in non-OECD countries, with its share of primary energy increasing to over 25% (*Figure 2*).

**Figure 2: Global natural gas and LNG demand to 2050**



Source: BP World Energy Outlook 2024

<https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2024.pdf>

LNG demand grows robustly throughout the Outlook, driven by increasing demand in non-OECD countries, with the increasing use of natural gas in these economies largely met by imported LNG.

But of course as we go into the 2030s and beyond uncertainty about the future level of gas and LNG demand increases. This is clearly shown by the extreme divergence between the 'current trajectory' and 'net-zero' scenarios, especially with regards to the level of LNG trade, which increases by 80% in the former but falls by about 40% in the latter.

According to BP, by 2050 around 80% of natural gas consumption will be abated through carbon capture and storage (CCS) technology.

The projected growth in fossil fuel consumption means that even though emissions will start declining later this decade, the process will be slow and, without technology advancements and policy change, by 2050 emission reduction will be about 25%, consistent with a global temperature rise of 2.5°C. In order to achieve net-zero by 2050, consumption of all fossil fuels should reach a peak by next year and decline rapidly thereafter – something that 'current trends' show is quite unlikely, even though decarbonizing power systems could help.

But there is a limit to how quickly the world can decarbonize the global energy system in an orderly manner without having to resort to policies and actions that have "outsized economic and social costs," that could lead to the kind of political backlash we saw during the European elections in June.

With an orderly transition becoming increasingly impossible, the world must invest more in adaptation -as COP28 identified.

Spencer Dale asked attendees to predict what technology would produce the biggest surprises in terms of accelerating decarbonisation. The most popular option was nuclear fusion, followed by AI-enabled improvements in energy efficiency.

As BP concluded, we cannot predict the future, but "the one thing we know for sure is that over the next 25 years, the energy system will change in ways that we can't even imagine today."

## **About the Author**

**Dr Charles Ellinas, Senior Fellow – Global Energy Center, Atlantic Council, USA,  
Visiting Research Fellow, IENE**

Over 35 years experience in the oil & gas sector in senior management positions.



Currently CEO of e-CNHC (E-C Cyprus Natural Hydrocarbons Company Ltd), providing management and advisory services in the oil & gas and energy sectors in Cyprus and the region. A lot needs to be done and the aim of the company is to contribute to the successful development of these sectors for the future of Cyprus.

Prior to this, as CEO of KRETYK, Cyprus' national hydrocarbons company, I was responsible for implementing Cyprus government's strategy for the development of its hydrocarbons sector.

Until 2012 I was a Director of Mott MacDonald for 25 years and the Managing Director of Mott MacDonald's Oil, Gas & Petrochemicals business world-wide.

Charles Ellinas is also: Features Editor, Natural Gas World, and Senior Fellow, Global Energy Center, Atlantic Council.