

Renewable energy – a requisite tool for tackling climate change

Published 12 June 2023

Mobeen Tahir

Director, Research

"The electric light did not come from the continuous improvement of candles." – Oren Harari

In the year 1900, the world had a simple energy mix. One half of total energy supply came from coal and the other came from biomass. Gas, oil, and hydropower existed but paled in comparison. Fast forward 121 years, by 2021, things had changed in two key aspects. First, oil and gas had come head-to-head with coal to collectively account for nearly 77% of the energy mix. And second, total energy consumption had increased 14x1.

This drastic increase in our energy consumption, and demand mostly satiated by fossil fuels, has created a problem. It has left us with a carbon budget of 380 gigatons of CO2 equivalent from the start of 2023. In other words, we could hit 1.5°C of warming in 9 years2.

That is, unless things change meaningfully. Not continuous improvement, but radical change. Like shunning fossil fuels for cleaner alternatives. Not only is this essential but, luckily, it is now achievable thanks to the advancement of renewable energy.

At the heart of the energy transition

Consider the gap between the base case (dark blue line in the chart below) in Figure 1 and the path we must adopt in the 1.5°C scenario (teal line). The teal scenario appears to be possible by doing a combination of two things. Where decarbonisation of power and transportation is possible, it must be done. Where it isn't, say heavy industries like steel and cement, carbon capture must be employed. Scaling up renewable sources of energy, therefore, is at the heart of this endeavour.

Figure 1: The difference between the base case and 1.5 degree and what's needed to get there

Source: WisdomTree, Wood Mackenzie.

Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.

A more efficient alternative

Historically, our total energy consumption has only moved in one direction – upwards. While population growth and advancement in industrialisation and technology are the prime reasons for this, another contributing factor is that energy efficiency has seldom been achieved on a large scale. But with the rapid

electrification of transport and buildings, efficiency gains vs using fossil fuels could result in total end-use demand for energy peaking by 2028 and, potentially, declining thereafter (in a 1.5°C scenario).

Source: WisdomTree, Wood Mackenzie. Mtoe = mega tonnes of oil equivalent.

Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.

Wind and solar have arrived

Among renewables, wind and solar are expected to play the leading role (see Figure 3). There are numerous reasons for this. First, both technologies have been around long enough to see significant cost reductions in recent years. According to a Bloomberg New Energy Finance report published in June 2022, new onshore wind now costs about \$46 per megawatt-hour (MWh), while large-scale solar plants cost \$45 per megawatt-hour. In comparison, new coal-fired plants cost \$74 per MWh, while gas plants cost \$81 per MWh.

Second, most places in the world have access to either wind or sunshine (if not both). The only challenge that needs to be overcome, therefore, is obtaining the necessary funding required to install renewable energy farms.

And third, wind and solar are seeing some exciting innovations. Consider floating offshore wind as an example. Floating offshore wind power has several benefits as a source of renewable energy. First, floating wind turbines can be deployed in deeper waters where traditional fixed-bottom turbines cannot reach. This allows for greater access to stronger and more consistent wind resources, which can generate more electricity at a lower cost. Additionally, floating offshore wind turbines are less visible from shore and have a smaller environmental footprint compared to onshore and fixed-bottom offshore wind farms. Furthermore, floating offshore wind farms have the potential to be located closer to population centres, reducing transmission costs, and improving energy security. Lastly, because they are not limited by the ocean floor, floating wind turbines can be moved to different locations if needed, making them a more flexible option for renewable energy production.

Wind and solar can be complemented by emerging sources of renewable energy like hydrogen. Green hydrogen, which is produced through the renewable electrolysis of water, that is, passing a current of renewable electricity through water, has the potential to help decarbonise both heavy-duty transport like trucks, ships, trains, and airplanes, and energy-intensive industries like steel and coal. As the production of green hydrogen achieves scale, cost-reductions will foster further growth.

Figure 3: Wind and solar have a significantly large role to play in a net zero world

Source: Wood Mackenzie, 2023.

Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.

The pathway forward

Renewable energy can help the energy sector deliver net zero with the aid of the following:

1. Effective policy design - regulatory, commercial, and technical barriers to entry be removed.
2. Capital - by 2050, US\$47 trillion is required to deliver the generation and infrastructure of a net zero energy system³.
3. Technology – wind and solar will need to be supported by emerging technologies like hydrogen and carbon capture.
4. System flexibility – innovative ways of energy storage and distribution will need to support renewable energy.
5. Sustainability – recycling will need to be scaled up to ensure we efficiently utilise natural resources.

Renewable energy is being fuelled by political will, technological progress, and investor interest. It is an exciting time to employ this tool in our fight against climate change.

1 Source: Visual Capitalist as of 10 March 2023 with original data from 'Our World in Data'.

2 Intergovernmental Panel on Climate Change, 2023.

3 Wood Mackenzie, 2023.

Related blogs

[+ Are we seeing a breakout moment in renewable energy?](#)

[+ The 1.5 degree goal driving the energy transition](#)

Important Risks Related to this Article

IMPORTANT INFORMATION

Marketing communications issued in the European Economic Area (“EEA”): This document has been issued and approved by WisdomTree Ireland Limited, which is authorised and regulated by the Central Bank of Ireland.

Marketing communications issued in jurisdictions outside of the EEA: This document has been issued and approved by WisdomTree UK Limited, which is authorised and regulated by the United Kingdom Financial Conduct Authority.

WisdomTree Ireland Limited and WisdomTree UK Limited are each referred to as “WisdomTree” (as applicable). Our Conflicts of Interest Policy and Inventory are available on request.

For professional clients only. Past performance is not a reliable indicator of future performance. Any historical performance included in this document may be based on back testing. Back testing is the process of evaluating an investment strategy by applying it to historical data to simulate what the performance of such strategy would have been. Back tested performance is purely hypothetical and is provided in this document solely for informational purposes. Back tested data does not represent actual performance and should not be interpreted as an indication of actual or future performance. The value of any investment may be affected by exchange rate movements. Any decision to invest should be based on the information contained in the appropriate prospectus and after seeking independent investment, tax and legal advice. These products may not be available in your market or suitable for you. The content of this document does not constitute investment advice nor an offer for sale nor a solicitation of an offer to buy any product or make any investment.

An investment in exchange-traded products (“ETPs”) is dependent on the performance of the underlying index, less costs, but it is not expected to match that performance precisely. ETPs involve numerous risks including among others, general market risks relating to the relevant underlying index, credit risks on the provider of index swaps utilised in the ETP, exchange rate risks, interest rate risks, inflationary risks, liquidity risks and legal and regulatory risks.

The information contained in this document is not, and under no circumstances is to be construed as, an advertisement or any other step in furtherance of a public offering of shares in the United States or any province or territory thereof, where none of the issuers or their products are authorised or registered for distribution and where no prospectus of any of the issuers has been filed with any securities commission or regulatory authority. No document or information in this document should be taken, transmitted or distributed (directly or indirectly) into the United States. None of the issuers, nor any securities issued by them, have been or will be registered under the United States Securities Act of 1933 or the Investment Company Act of 1940 or qualified under any applicable state securities statutes.

This document may contain independent market commentary prepared by WisdomTree based on publicly available information. Although WisdomTree endeavours to ensure the accuracy of the content in this

document, WisdomTree does not warrant or guarantee its accuracy or correctness. Any third party data providers used to source the information in this document make no warranties or representation of any kind relating to such data. Where WisdomTree has expressed its own opinions related to product or market activity, these views may change. Neither WisdomTree, nor any affiliate, nor any of their respective officers, directors, partners, or employees accepts any liability whatsoever for any direct or consequential loss arising from any use of this document or its contents.

This document may contain forward looking statements including statements regarding our belief or current expectations with regards to the performance of certain assets classes and/or sectors. Forward looking statements are subject to certain risks, uncertainties and assumptions. There can be no assurance that such statements will be accurate and actual results could differ materially from those anticipated in such statements. WisdomTree strongly recommends that you do not place undue reliance on these forward-looking statements.

WT Issuer ICAV

The products discussed in this document are issued by WisdomTree Issuer ICAV ("WT Issuer"). WT Issuer is an umbrella investment company with variable capital having segregated liability between its funds organised under the laws of Ireland as an Irish Collective Asset-management Vehicle and authorised by the Central Bank of Ireland ("CBI"). WT Issuer is organised as

an Undertaking for Collective Investment in Transferable Securities ("UCITS") under the laws of Ireland and shall issue a separate class of shares ("Shares") representing each fund. Investors should read the prospectus of WT Issuer ("WT Prospectus") before investing and should refer to the section of the WT Prospectus entitled »Risk Factors¼ for further details of risks associated with an investment in the Shares.