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FOCUS ON CHANGE

Stocktake of the energy transition

January 2024

The long-term shift in the energy sector from fossil fuels to a multi-fuel, multi-technology, low-carbon system is the inevitable route to a sustainable future. But are we on track to achieve this? As the 2023 UN Climate Change Conference (COP28) included the first global stocktake on climate goals, we've used some of the insights for our own assessment of the energy transition's progress and to highlight risks and opportunities for investors.

What is the energy transition and what does it look like?

COP28 reiterated the warning that global greenhouse gas (GHG) emissions must peak before 2025 and reach net zero by 2050 to keep the temperature goal of the Paris Agreement within reach. As the energy sector is estimated to account for more than 75% of global GHG emissions,[1] the energy transition will be instrumental in achieving these goals.

The transition requires a global change in how we produce and consume energy. Recognising this, for the first time in the history of UN Climate Conferences, the decision taken at COP28[2] explicitly called on parties to transition away from fossil fuels, with the need to scale up zero- and low-emission technologies (including nuclear energy) and to phase out inefficient fossil-fuel subsidies. The outcome also set a specific target to triple renewable energy capacity and to double energy efficiency by 2030.

How these goals are achieved and what the pathways of the energy transition will look like will be different for each country. However, it's clear that even full implementation of current climate action plans (nationally determined contributions, or NDCs) are insufficient to limit global warming to 1.5°C above pre-industrial levels, and current plans fall short of countries' long-term net zero targets.[3]

Previous energy transitions (from wood to coal, then to oil & gas) were driven by economic and technological changes that took place over a century or more.[4] But to meet net-zero emissions by 2050, the current transition has to be completed in a quarter of that time. At present, the world is neither investing in new energy systems fast enough[5] to deliver them quickly nor investing in traditional energy sources (which remain necessary during the transition) at the levels historically required to sustain them. This could lead to a messy transition pathway, with shocks to key commodity markets and value chains along the way.

The IEA's analysis[6] shows that solar PV is the only renewable energy technology on track with the Paris Agreement goals. All other technologies (wind, hydro, geothermal, solar thermal and ocean energy) need to be deployed at an average rate of about 13% during 2023–2030, which is double the average over the past five years.

[1] World | Total including LUCF | Greenhouse Gas (GHG) Emissions | Climate Watch (climatewatchdata.org)

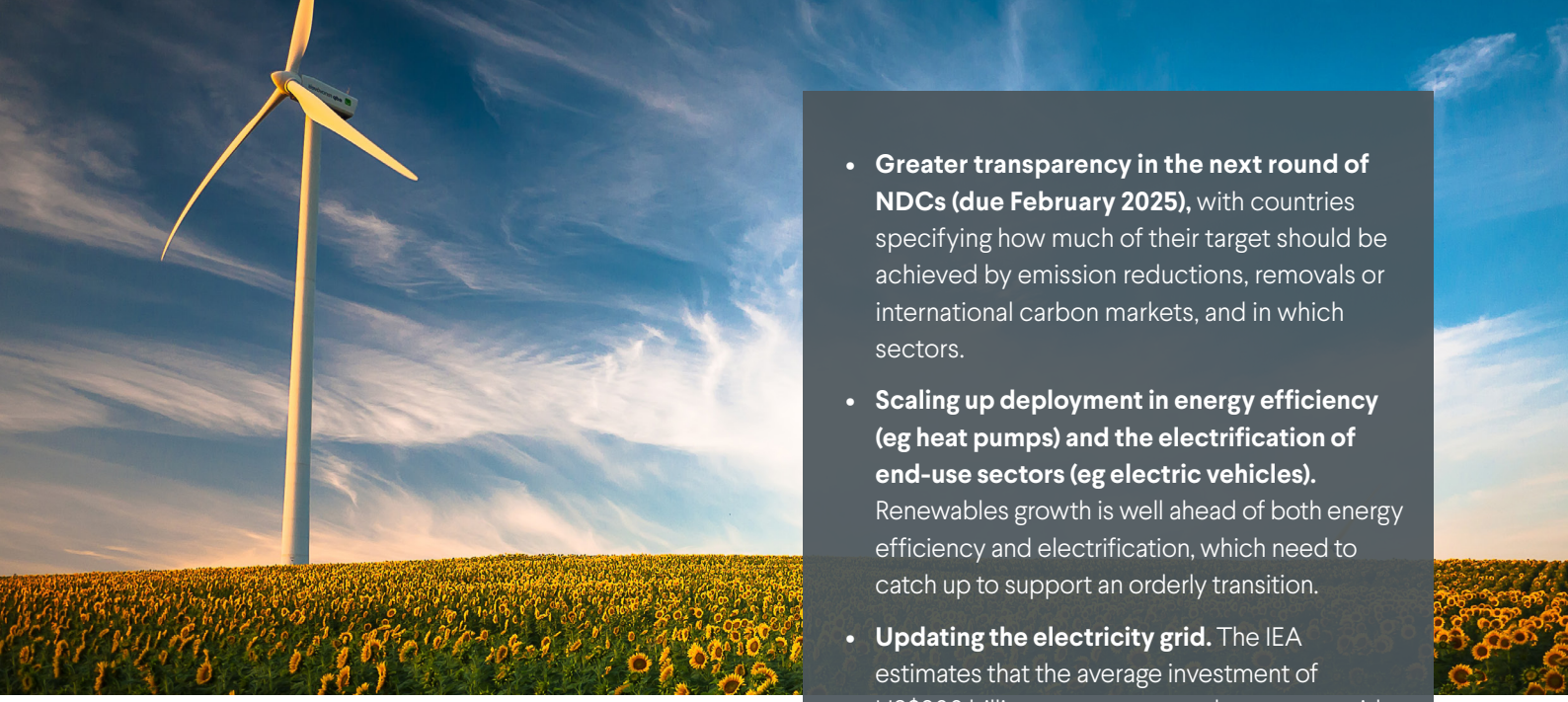
[2] Outcome of the first global stocktake. Draft decision -/CMA.5. Proposal by the President (unfccc.int)

[3] Climate Pledges Explorer – Data Tools - IEA; Global Energy Transitions Stocktake – Topics - IEA

[4] Bumps in the Energy Transition (imf.org)

[5] Renewables - Energy System - IEA

[6] Ibid



What could the next phase look like?

Recent geopolitical events, including the crisis in Ukraine and uncertainty in the Middle East, have highlighted the risk of relying on centralised energy systems dependent on fossil fuels. In response to these events, governments have made short-term interventions, such as reviving oil & gas projects or offering fossil-fuel subsidies. However, despite their short-term necessity, it's clear that the support for such interventions is temporary, with long-term policies such as REPowerEU, the US Inflation Reduction Act and China's 14th Five-Year Plan for Renewable Energy supportive of the transition to clean energy.

These policies are expected to lead to strong growth in renewables deployment and in clean energy jobs, which already employ over 50% of the 67 million energy workers worldwide.[7] The IEA expects clean energy jobs to grow by around 1.5 million per year to 2030 as fossil-fuel jobs decline by 0.5 million annually – a net increase of 1 million jobs per year attributable to the transition.[8]

The next phase of the transition requires significantly scaling up the deployment of renewables while electrifying other sectors of the economy. Despite a number of challenges, we've highlighted a few areas where progress could deliver substantial results:

- **Greater transparency in the next round of NDCs (due February 2025),** with countries specifying how much of their target should be achieved by emission reductions, removals or international carbon markets, and in which sectors.
- **Scaling up deployment in energy efficiency (eg heat pumps) and the electrification of end-use sectors (eg electric vehicles).** Renewables growth is well ahead of both energy efficiency and electrification, which need to catch up to support an orderly transition.
- **Updating the electricity grid.** The IEA estimates that the average investment of US$300 billion per year currently spent on grid improvements needs to double in the 2030s to accommodate a multi-technology energy system.[9] Even if this is financed privately, governments will have an important role to play in overcoming challenges such as the long permitting periods, technical complexities, and the shortage of skilled labour and materials.
- **Investing in low-emissions fuels and nuclear power to manufacture products that may be hard to electrify (such as steel, cement, ammonia and plastic).** The technology to make this switch already exists, but it needs to be improved and scaled up to make it as cost effective as existing methods of production.
- **Stronger supply chains.** Unprecedented demand for hardware, including solar panels, wind turbines and batteries, has already put significant pressure on underlying supply chains, from mining and refining to the manufacturing of semi-finished and end products. The IMF, the World Bank, the IEA and various governments have issued studies on these supply chains and on critical mineral shortages. Progress would require significant international co-operation but is likely to lead to a more orderly transition than leaving it up to market forces.
- **Investments and actions to reduce the carbon intensity of fossil fuels, which are part of the energy transition mix.** Governments will play an important role in addressing methane emissions from existing facilities and encouraging lower-emission and flexible fossil fuel assets that can adjust production to meet demand.

[7] Global Energy Transitions Stocktake – Topics - IEA

[8] Energy Transition's clean technologies are empowering an industrial policy revolution - Carbon Tracker Initiative

[9] Executive summary – Electricity Grids and Secure Energy Transitions – Analysis - IEA

Conclusion

The path to 1.5°C has narrowed but could still be achieved by building on current global momentum. The rewards of a shift to a multi-fuel multi-technology system are not disputed – renewable power is now cheaper, more local, provides more jobs and emits far less carbon. To what extent and how quickly the transition takes place in practice will differ. With more than 70 countries holding elections in 2024, political changes could speed up or slow down the transition in different regions.

Despite the regional setbacks, the scaling-up phase of the transition will provide a number of investment opportunities for investors globally. The graphic below from the IEA's energy progress tracker [10] shows which sectors are on track for net zero by 2050 and where more effort is needed, many of which may already form part of asset owners' portfolios. Areas such as large-scale energy storage, smart grids and hydrogen are all evolving technology areas where there may be scope for further investment. We'll examine such investment opportunities in the next article in this series, followed by a consideration of what the future of the fossil-fuel industry may look like.

What's on track?

	On track	More efforts needed	Not on track
Energy system	• Electricity from solar	• Energy efficiency • Electrification • Electricity from other renewables (wind, bioenergy, hydroelectricity, nuclear power) • Electricity from transition fuels (natural gas) • Smart grids and battery storage	• Coal • Low emission / biofuels
Transport	• Electric vehicles	• Fossil fuel combustion cars and vans • Rail	• Trucks and buses • Aviation • Commercial shipping
Industry		• Electrification or hydrogen to decarbonise large industries • Light industry • Data centres and data transmission networks • Hydrogen electrolysers	• Large industry (steel, chemicals, cement, paper)
Buildings	• Lighting (LEDs)	• Heating, cooling and equipment in buildings • Heat pumps	• District heating
Oil & natural gas			• Methane abatement • Gas flaring
CO2 abatement		• CO2 capture and utilisation	• CO2 transport and storage

[10] Tracking Clean Energy Progress 2023 – Analysis - IEA

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