International Energy Agency "Net Zero by 2050" report

Business summary

Quick summary

The IEA's new report "Net Zero by 2050" charts a course for what the global energy system must do to support a pathway that limits global warming to 1.5°C, providing momentous analysis on many levels.

First, the language from this global body is stark in tone, referring to the climate crisis as needing an "singular, unwavering focus from all governments—working together with one another, and with businesses, investors and citizens".

It stresses "no need for investment in new fossil fuel supply in our net zero pathway" and therefore reflects a radical departure from previous publications that were more moderated and focused on energy stability.

Second, the report details a long list of specific quantitative actions across multiple sectors required to achieve this pathway. In many cases these are dramatically different from current actions and plans, for example no new oil or gas fields or coal mines from this year, or a 60% global sales target for passenger cars by 2030. The impact of choosing these actions is balanced against the need for energy security and ensuring just and fair transition.

Third, for the first time the world now has a plan and a checklist with hundreds of milestones to assess progress in the highest emitting sectors, and the calls will now be for the IEA to incorporate this pathway in their "base case" modelling and to develop detailed analysis for countries and companies.

In short, there is what some have called a "stunning gap" between where the energy sector is and where it needs to be and while this Net Zero pathway is feasible, the IEA's Chief Energy Analyst says that it is "very, very narrow ".

Background

The IEA report "Net Zero by 2050" is designed to inform the high-level negotiations that will take place at the 26th Conference of the Parties (COP26) of the United Nations Framework Convention on Climate Change Convention in Glasgow in November. It was requested as input to the negotiations by the UK government as incoming COP26 Presidency.

As the report notes, the pledges made under the Paris Agreement are mostly non-binding, aspirational goals. But "there are still pathways to reach net zero by 2050," it states, even though "that pathway remains narrow and extremely challenging, requiring all stakeholders — governments, businesses, investors and citizens — to take action this year and every year after so that the goal does not slip out of reach."

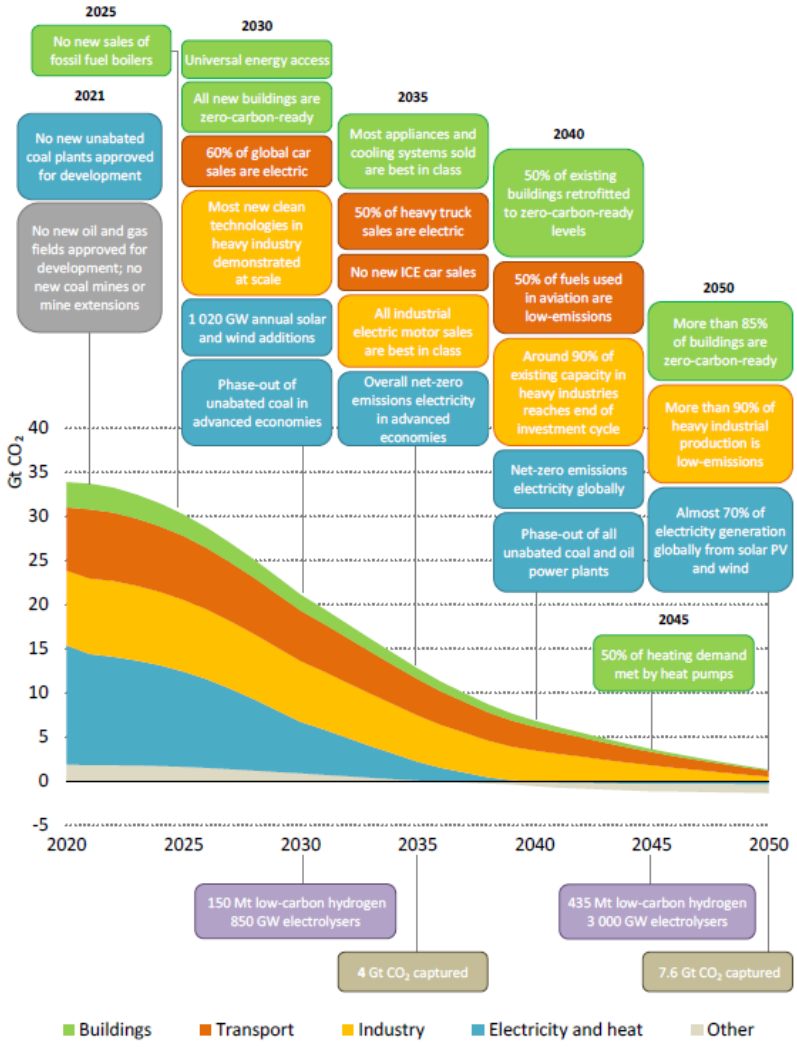
The report therefore considers the need for a global pathway that explores what would need to happen in the energy sector to achieve net-zero emissions by 2050. In line with an official request by the COP26 Presidency the report provides the first comprehensive energy-sector pathway towards global net-zero emissions by 2050. It assesses the policy requirements, the deployment and innovation needs, the necessary investments, the economic benefits and the wider implications for the world.

Key findings

According to the report, the actions required to transform global energy consumption and production can be mapped across **important milestone dates between now and 2050**, including:

- No new oil and gas fields, and no new coal mines or mine extensions (beyond those already committed) from this year.
- Halting construction of all new coal plants this year, unless they are built with carbon-capture technology.
- Closing all coal-fired power plants not fitted with carbon-capture technology by 2040. Coal exit in the OECD by 2030.
- Increasing the use of renewable sources of energy from 29% in 2020 to 90% in 2050.
- Implementing a ban in 2025 on the sale of new oil and gas boilers to heat buildings.
- Net zero emission electricity in advanced economies.
- Phasing out internal combustion engine car sales by 2035.
- 60% of global car sales are electric by 2030 and conversion of vehicle fleets to either electric or hydrogen fuel sources by 2050.
- Shifting power plants away from carbon emissions to renewable sources of energy by 2035.
- Transitioning half of all plane-travel energy sources to hydrogen or biofuels by 2040.
- 70% of global electricity is generated from solar PV and wind by 2050.

Figure 1: Key milestones in the pathway to net zero



The report builds on the IEA's energy modelling tools and expertise, and sets out more than 400 milestones to net zero by 2050. These include, from today, no investment in new fossil fuel supply projects, and no further final investment decisions for new unabated coal plants. By 2035, there are no sales of new internal combustion engine passenger cars, and by 2040, the global electricity sector has already reached net-zero emissions.

It finds that most of the global reductions in emissions between between now and 2030 from readily available technologies. But in 2050, almost half the reductions will have to come from technologies that are currently only at the demonstration / prototype phase. This implies massive shifts in public spending on research and development, as well as on demonstrating and deploying clean energy technologies, putting them at the core of energy and climate policy.

The report finds that progress in the areas of advanced batteries, electrolyzers for hydrogen, and direct air capture and storage can be particularly impactful.

According to the report, total annual energy investment must surge to USD $5 trillion by 2030 in the net zero pathway, adding an extra 0.4 percentage points a year to global GDP growth (based on a joint analysis with the International Monetary Fund). The jump in private and government spending would be expected to create millions of jobs in clean energy, including energy efficiency, as well as in the engineering, manufacturing and construction industries. All of this puts global GDP 4% higher in 2030 than it would reach based on current trend.

By 2050, global energy demand is around 8% smaller than today, but it serves an economy more than twice as large and a population with two billion more people, according to the model. Almost 90% of electricity generation comes from renewable sources, with wind and solar PV together accounting for almost 70%. Most of the remainder comes from nuclear power. Solar is the world's single largest source of total energy supply.

Fossil fuels fall from almost four-fifths of total energy supply today, to slightly over one-fifth. The remaining fossil fuel usage is for goods where the carbon is embodied in the product such as plastics, in facilities fitted with carbon capture, and in sectors where low-emissions technology options are scarce.

Figure 2: Clean energy investment in the net zero pathway

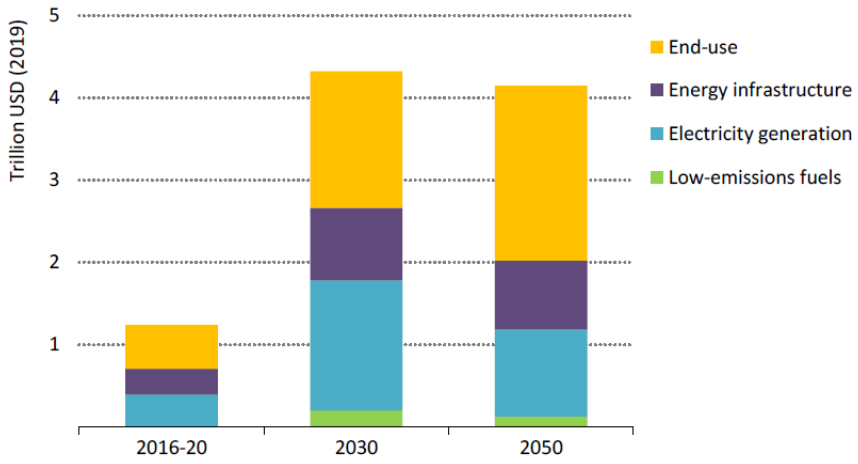
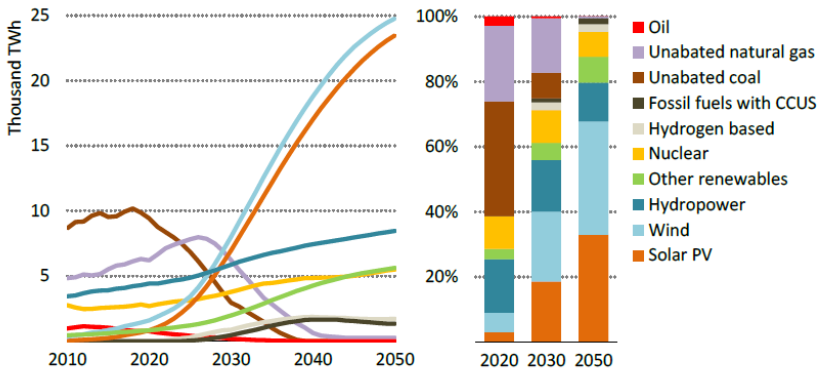
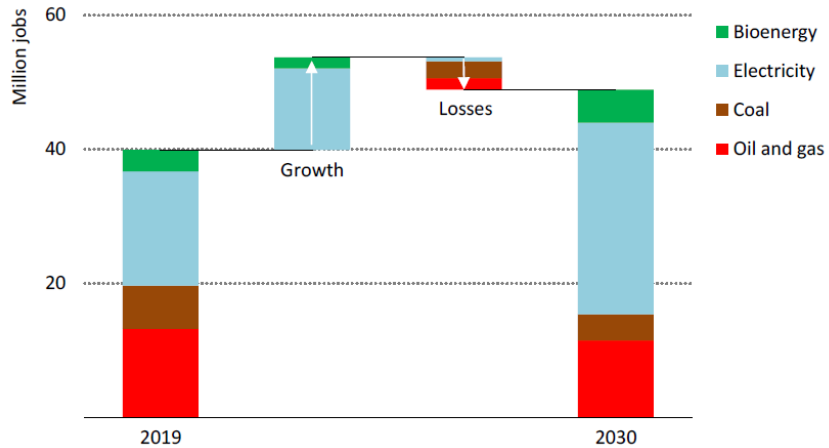


Figure 3: Global electricity generation by source in the NZE



Solar and wind power race ahead, raising the share of renewables in total generation from 29% in 2020 to nearly 90% in 2050, complemented by nuclear, hydrogen and CCUS

Figure 4: Global employment in energy supply in the net zero pathway, 2019-2030



Reflections and reactions

This landmark report by the global energy agency comes at a critical moment, ahead of crucial G7 and G20 meetings, and will show leaders what immediate action needs to be taken to align with the 1.5°C and net-zero goals. It also emphasizes the need for "unprecedented international co-operation among governments" to achieve them.

"We all welcome this seminal piece of work from the IEA both for its rigor and for highlighting in detail the actions needed to move energy emissions to a 1.5 °C pathway, said **WBCSD President and CEO, Peter Bakker**. "There is clearly an enormous gap between current global plans and actions and those needed but for the first time we can clearly see the size of the challenge and the action plan we have to adopt. At WBCSD we are working with our members all along the energy value chain to rise to this challenge."

Alok Sharma, president-designate of COP26 and a former UK business secretary, said: "We must act now to scale up clean technologies in all sectors and phase out both coal power and polluting vehicles in the coming decade.

Our first goal for the UK as COP26 presidency is to put the world on a path to driving down emissions, until they reach net zero by the middle of this century."

"This is an incredibly exciting study that indicates a direction of hope," said **Francesco Starace, CEO at Italian utility Enel** upon the launch of the report. "The 'Net Zero by 2050' report just released by the IEA is a milestone in the journey to reshape the world's energy sector. Only this time it is not just a report, it is rather an extremely well-articulated, documented and utterly motivating call for action".

Until now, the IEA had not provided any comprehensive tools to steer investment in line with the urgent 1.5°C limit, the ambition governments and many corporations have committed to pursue. **IEA boss Fatih Birol** has pledged that the scenario at the heart of this report will be "integral" to the 2021 World Energy Outlook (WEO). This comes in response to progressive OECD governments, climate advocates, businesses, and investors who have pressed the IEA to put 1.5°C at the center of its analysis.

However, some commentators feel that this is merely the beginning of the much-needed reform in the IEA, and that further work is needed to address modelling assumptions that continue to undersell clean electricity and risk overreliance on fossil fuels (especially gas), carbon capture and storage, and bioenergy; and to make its own funding more transparent.

Closing the gap will will largely depend on whether it becomes a central element of the IEA's flagship annual World Energy Outlook (WEO), and all future IEA analysis. The scenario that the IEA positions as the central scenario in the WEO commonly becomes what governments and investors use as their default for energy decision making. It is where decision makers look year after year to guide trillions of USD in public and private capital.

In doing so, the IEA could have a transformative impact in helping the world achieve the Paris goals by reforming the WEO to focus on 1.5°C-aligned investment, and upgrading its own modelling assumptions.

What's next

In his foreword to the report, Fatih Birol states that meeting the goals it lays out will be enormously difficult. "The world has a huge challenge ahead of it to move net zero by 2050 from a narrow possibility to a practical reality. Global carbon dioxide emissions are already rebounding sharply as economies recover from last year's pandemic-induced shock. It is past time for governments to act, and act decisively to accelerate the clean energy transformation."

He emphasizes that the IEA will use the Roadmap to guide future work and that the IEA will do everything it can to help governments around the world to act on its insights, build out their own national roadmaps, and implement the policies needed to achieve their net zero goals.

The IEA report also makes clear that "without greater international cooperation, global CO2 emissions will not fall to net zero by 2050." Major economies will need to show solidarity and support, by taking stronger action at home, and offering technical and financial support to ensure the deployment of key technologies and infrastructure.
WBCSD is working with our members and partners to analyze the findings in this landmark report and to ensure that they can play an instrumental role in driving systems transformation in the energy system and beyond, as we ramp up efforts to limit the rise in global temperatures to 1.5°C.

As we gear up on preparations towards COP26 in November, and the UN High Level Dialogue on Energy in September, WBCSD is engaged through our **Green Brick Road** to COP26 series of dialogues and events, aimed at empowering member companies with the right information and tools to influence these crucial moments this year.

For further information on our work on climate action and energy, kindly contact Karl Vella.

About the World Business Council for Sustainable Development (WBCSD)

WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world. We help make our member companies more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies.

Our member companies come from all business sectors and all major economies, representing a combined revenue of more than USD $8.5 trillion and 19 million employees. Our global network of almost 70 national business councils gives our members unparalleled reach across the globe. Since 1995, WBCSD has been uniquely positioned to work with member companies along and across value chains to deliver impactful business solutions to the most challenging sustainability issues.

Together, we are the leading voice of business for sustainability: united by our vision of a world where more than 9 billion people are all living well and within planetary boundaries, by 2050.

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