

Scientists list four key actions to halt global warming

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The latest edition of the JRC's Global Energy and Climate Outlook (GECO), identifies four technological dynamics in the energy sector that have the power to limit global warming to below 2°C if implemented simultaneously.

The global average temperature is already 1°C above the pre-industrial levels and today's emissions and [energy](#) consumption trends are not on track to meet the targets of the Paris Agreement.

But the means exist to reach those targets.

The JRC's latest Global Energy and Climate Outlook (GECO), produced jointly with the Chinese National Center for Climate Change Strategy and International Cooperation (NCSC), shows that it is technically possible to reach the 2°C target of the Paris agreement—at relatively low cost—by simultaneously transforming four elements of the energy system.

Electrification can supercharge the energy transition

Electricity is increasingly produced from [renewable energy sources](#). Therefore, electrification—replacing technologies that run on [fossil fuels](#) with alternatives that run on electricity—plays a key role in the energy transition.

The report finds that electrification rates have been increasing in all energy-consuming sectors (industry, buildings and transport), and will continue to increase even in the absence of new, stronger climate policies.

However, a further push is needed to electrify the energy consuming sectors so as to accelerate the decarbonisation of the entire energy system.

Transport, in particular, is one of the crucial sectors that has shown a very low degree of electrification so far, but this situation is likely to revert soon thanks to the quick development of electric vehicles and the expected uptake of electricity-derived synthetic fuels.

When combined with a transition towards [renewable electricity](#), electrification can also have positive effects for air quality and human health.

Decarbonising power generation

Decarbonisation of [power](#) generation can be achieved by increasing the share of low-carbon energy sources, particularly renewables, and reducing the use of fossil fuels.

With the decarbonization of power generation, electricity progressively becomes a low-carbon fuel.

The JRC report argues that full decarbonization of power generation is not only technically feasible but also an economically cost-attractive measure to combat climate change.

Key low-carbon [power generation](#) technologies are already available. And with lower generation cost

than that of fossil fuel-based technologies in a growing number of markets around the world, they are also increasingly competitive.

Apart from electricity, the 2°C scenarios also see the wider adoption of other low-carbon energy carriers such as liquid biofuels, hydrogen, e-gas and e-liquids.

Boosting energy efficiency

Energy efficiency options in our buildings, transportation, and industrial sectors help save energy and reduce consumption.

The report stresses that the switch from inefficient fossil fuel technologies to more-efficient electric ones offers efficiency gains.

For instance, electric technologies such as heat pumps in buildings and electric vehicles have higher energy efficiency than traditional heating systems and vehicles.

Mobilising novel options for integrating and storing green energy

The report also calls for mobilizing new solutions that would enable the expansion of renewable energy technologies, some of which are intermittent by nature.

For instance, stationary energy storage solutions can be used to increase the share of renewables in the power mix, and stabilize the power grid.

What's the cost?

The study shows that it is technically possible to transition to clean energy and reach the 2°C target at relatively small cost, while triggering benefits, such as improvements in air quality, and reducing the economic impacts of climate change itself.

The scientists estimated that the cost over the coming decades would add up to 0.03% of GDP annually, meaning that the global economy would still more than double by 2050.

The report also stresses that better enabling

conditions for electrification can play a significant role in lowering the macroeconomic costs.

More information: Global Energy and Climate Outlook 2019: Electrification for the low-carbon transition. [ec.europa.eu/jrc/en/publicatio ... ow-carbon-transition](https://ec.europa.eu/jrc/en/publication/2019-07-10-ec-climate-outlook-2019-electrification-for-the-low-carbon-transition)

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