
Getting the mix right: How climate investment can strengthen the economy and society

Press Release

Germany has pledged to become climate-neutral by 2045. After a successful first phase of the transition, there are now steep challenges ahead. A new Agora study shows which mix of measures can be used to create a socially balanced path forward and mobilise the necessary investments.

15 October 2024. Three quarters of the investment required for a climate-neutral Germany can be mobilised by diverting funds away from fossil fuel technologies and towards climate-neutral alternatives, according to a new study by the Agora think tanks. The total annual investment needed until 2045 is 11 percent of gross domestic product (GDP), the majority of which would be required even without climate protection: Significant investments amounting to around 8 percent of GDP annually would be required regardless of climate neutrality objectives. These baseline investments for the maintenance and renewal of buildings, industrial facilities and means of transport need to be redirected towards climate neutral solutions to bring Germany onto a path towards climate neutrality. Thus, the additional investment needed between 2025 and 2045 for climate protection amounts to around 3 percent of GDP or 147 billion euros per year. The majority of this will be private investment; only a quarter - around 38 billion - will come from the public sector.

Many of these necessary investments already pay for themselves over the course of their lifetime. For example, despite higher purchase costs, electric cars are often already cheaper than petrol and diesel vehicles due to their lower operating costs. In the Agora scenario, around 90 percent of the necessary electricity system investments for renewable energy production and electricity grids are recovered through market revenues and grid fees. Meanwhile, the costs of the electricity system per kilowatt hour (kWh) would remain stable until 2030 and even fall by a fifth by 2045.

The Agora study 'Climate-Neutral Germany - from Targets to Implementation' is the first to provide a detailed calculation of the respective investment needs based on cross-sectoral scenario modelling. The study also proposes a balanced package of measures to make this expenditure possible in a cost-efficient manner while ensuring that it is socially just.

"Our vision for the future is not a foregone conclusion. For it to become reality, we need decisive policy measures," says Simon Müller, Director of Agora Energiewende Deutschland. "The path to climate neutrality requires an effort by society as a whole that will benefit all parts of society," says Müller.

The development described in the scenario is associated with a number of additional advantages. For example, Germany's dependence on energy imports will fall by 85 percent over the next 20 years. Companies that invest in key technologies such as electric mobility, renewable energy and climate-neutral industrial production will secure a long-term advantage in global growth markets. The transformation of transport and heating also offer opportunities to improve people's quality of life. According to the study, in order to avoid excessive cost burdens for companies or households during the transition to climate neutrality and to provide them with targeted support

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for their investments, annual public funding of 58 billion euros will be needed until 2030. These state funds will mainly flow into investment and operating cost subsidies, for example in the building sector or as part of carbon contracts for difference. To a much lesser extent, it also finances compensation payments for households and companies that compete in global markets. Examples include continuing electricity price compensation and the introduction of targeted social compensation payments.

A policy mix for a balanced climate policy

In order to mobilise the necessary investments, the Agora study recommends a mix of four complementary policy instruments. **Price-based incentives** such as carbon pricing make fossil fuels more expensive and thus make climate-friendly technologies more attractive. **Market regulation** makes it possible to restrict harmful technologies and thereby support climate-friendly technologies. However, both instruments do not yet ensure affordability: in order to enable households and companies without sufficient financial resources to switch to climate-neutral alternatives such as electric vehicles, **financial support** in the form of subsidies or low-interest financing is needed. However, focusing too heavily on government support carries the risk of public budget burdens and cost inefficiency. The study sees the fourth key component in the expansion and renewal of sustainable energy and transport **infrastructure**, as this is a basic prerequisite for switching to climate-neutral alternatives.

"A balanced policy mix is the key to the transition to climate neutrality," says Müller. "Market regulation creates investment security, price-based incentives mobilise market forces for climate protection and financial support ensures social fairness and prevents undue burden to individuals. Infrastructure provides the foundation for practical implementation and strengthens public support for the path to climate neutrality."

A significantly more efficient electricity system with falling costs per kilowatt hour

The study results on the energy sector show that renewable electricity is economically affordable based on these measures and also accounting for the cost of grid expansion and dispatchable power plants.: Incentivised by the European emissions trading system and low production costs, renewable energy steadily expands as the cheapest form of power generation: by 2045, generation from renewable energies increases fivefold from 219 TWh in 2023 to 1,087 TWh in 2045. Incentives for electrification, such as a reduced electricity prices for heat pumps and support for industry to make the switch, will ensure that supply and demand develop in sync. The average costs of this electricity system will remain relatively stable for all consumer groups at 16 cents per kilowatt hour until 2030 and fall to 13 cents per kilowatt hour by 2045.

At the same time, the expansion of renewable energy will reduce dependence on energy imports by almost 85 percent: from 2,474 terawatt hours in 2019 to 391 terawatt hours in 2045.

"In our scenario, electricity will not become more expensive in the future, even if consumption rises sharply," says Müller. "This is good news for companies and consumers. At the same time, the growing share of domestically generated renewable electricity strengthens Germany's energy security."

Today's climate protection investments secure tomorrow's competitiveness

The investments and measures set out in the study also create the basis for overcoming the current weakness of the industrial sector, strengthening its competitiveness and allowing it to regain a leading position internationally

when it comes to the technologies of the future. These measures include the direct electrification of process heat, which in the Agora scenario can replace most of the fossil energy previously used for this purpose by 2035 and massively increase efficiency. By 2040, natural gas consumption in industry will fall to almost zero, while electricity consumption doubles compared to 2025 to more than 400 terawatt hours. For the emission-intensive steel and concrete sectors, the study suggests creating green lead markets to make the switch to climate-neutral production methods more economically attractive. Here, the construction industry can become a driver of industrial transformation if, for example, emission limits are set for new buildings or by requiring such raw materials in government procurement.

In addition, new value chains are emerging, for example by replacing previously imported fossil raw materials in the chemical industry with biomass grown sustainably domestically.

"We are currently seeing a crisis particularly of conventional business models. If the right course is set now to trigger the necessary climate-neutral investments in industry, the German economy will be competitively positioned in many important future markets," says Frank Peter, Director of Agora Industrie.

Clean mobility as a key technology

In the Agora scenario, strengthening future technologies also plays a central role in the automotive industry. This requires a strong national market for electric vehicles and reliable framework conditions.

"Planning security and investment incentives to switch to electric drivetrains are crucial for the competitiveness of the German automotive industry," says Dr Wiebke Zimmer, Deputy Director of Agora Verkehrswende.

"Consumers will benefit from this too. This is because electric cars are already often cheaper than combustion engines when life cycle costs are taken into account - and the prices of petrol and diesel will continue to rise in the coming years, also due to European CO₂ pricing."

The scenario cites a comprehensive and socially balanced reform of taxes and levies, in particular the consistent alignment of vehicle and company car taxation with CO₂ emissions, as the key to the drive transition in road transport. "The CO₂ fleet limits must be maintained and instead of higher import duties on electric cars from China, the EU and in particular German industry should focus on cooperation with Chinese companies," says Zimmer. Purchasing incentives are most likely to make sense for smaller electric vehicles and used cars, as this would benefit those who depend on their car but at the same time cannot afford an expensive new vehicle.

Finally, a sustained, nationwide investment boost for public transport and vehicle sharing services must be launched in order to guarantee minimum levels of mobility in rural areas as well, without the need for private cars. The study shows that by 2040 at the latest, passenger rail transport capacity can be doubled and local public transport increased by 80 percent. Together with the electrification of transport, shifting traffic to buses and trains opens up new possibilities to redesign public spaces - with less noise and pollution as well as greater safety and attractiveness. "A coherent transformation in the transport sector safeguards economic opportunities, ensures all parts of society can benefit and increases quality of life for everyone," says Zimmer.

Enabling climate-neutral living

Climate and socio-political challenges also arise in the building sector, which is likewise lagging behind when it comes to meeting climate targets. As a result of EU emissions trading, rising prices for fossil-fuelled heating

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systems are expected from 2027 onwards. On the one hand, targeted public support is needed here to enable all households to switch to climate-friendly alternatives. On the other hand, the study proposes clear regulatory requirements for the energy efficiency of buildings, as renovations not only make houses more heat-resistant; they also reduce energy consumption and thus the costs for their residents. However, targeted state financial support is needed, because even if energy-efficient renovations lead to an increase in value, not all households have the means to invest.

“Effective climate policy ensures a liveable future for everyone. It is high time for society as a whole to tackle this task, regardless of party lines. We want our study to contribute to this,” says Müller.

The 88-page study ‘Climate-Neutral Germany - From Targets to Implementation’ was commissioned by Agora Energiewende, Agora Industrie, Agora Agrar and Agora Verkehrswende and produced by Prognos AG, the Öko-Institute, the Wuppertal Institute and the University of Kassel. The English summary can be downloaded free of charge below.