



Dual-Benefit Stimulus for Germany

A Proposal for a Targeted 100 Billion Euro Growth and Investment Initiative

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Preface

The coronavirus pandemic has upended the status quo like no other event in recent memory. The virus has impacted nearly every country in the world and, as of early May, has claimed more than 250,000 lives. In an effort to contain the pandemic, governments have introduced unprecedented social distancing measures closing large sections of the economy and severely restricting the movement of people. As a result, the global economy faces what is likely the greatest crisis since the Great Depression. For the European Union, the coronavirus pandemic is the most momentous test in its 30-year history.

As if that were not enough, the next crisis is already in the offing. The threat of global warming has not grown any smaller just because the world's attention is focused on the coronavirus pandemic; on the contrary. 2020 is shaping up to be one of Germany's driest years on record and one of the world's hottest ever. Scientists' warnings about the effects of global warming are just as urgent as their warnings about the costs of waiting to contain the pandemic.

We have neither the time nor the means to handle these crises in succession. We need a stimulus package that boosts economic growth and moves the economy towards climate neutrality. The investments we make must address the needs of today while taking into account the long-term challenges of tomorrow. Anything less is not only unsustainable; it will sow the seeds for the next crisis.

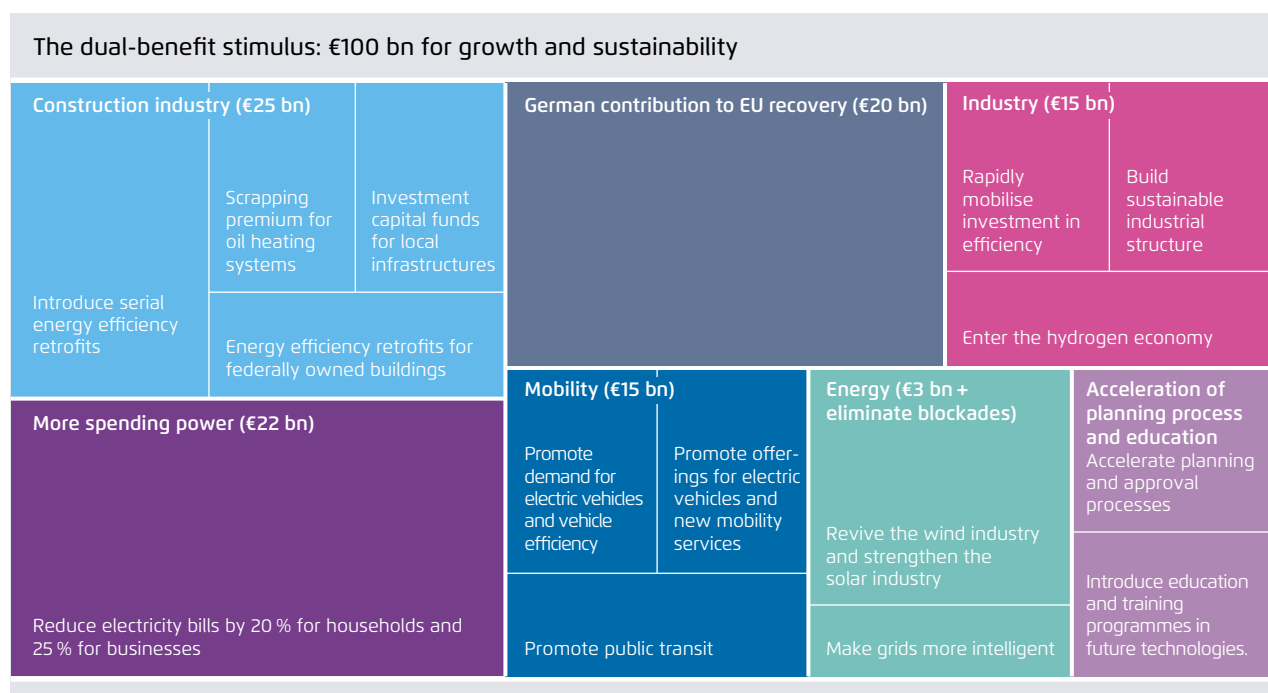
Agora Energiewende and Agora Verkehrswende have thus proposed a massive growth and investment initiative that takes aim at both objectives. Many thanks to everyone who has provided input as we developed the proposal over the past four weeks. Their comments have been invaluable.

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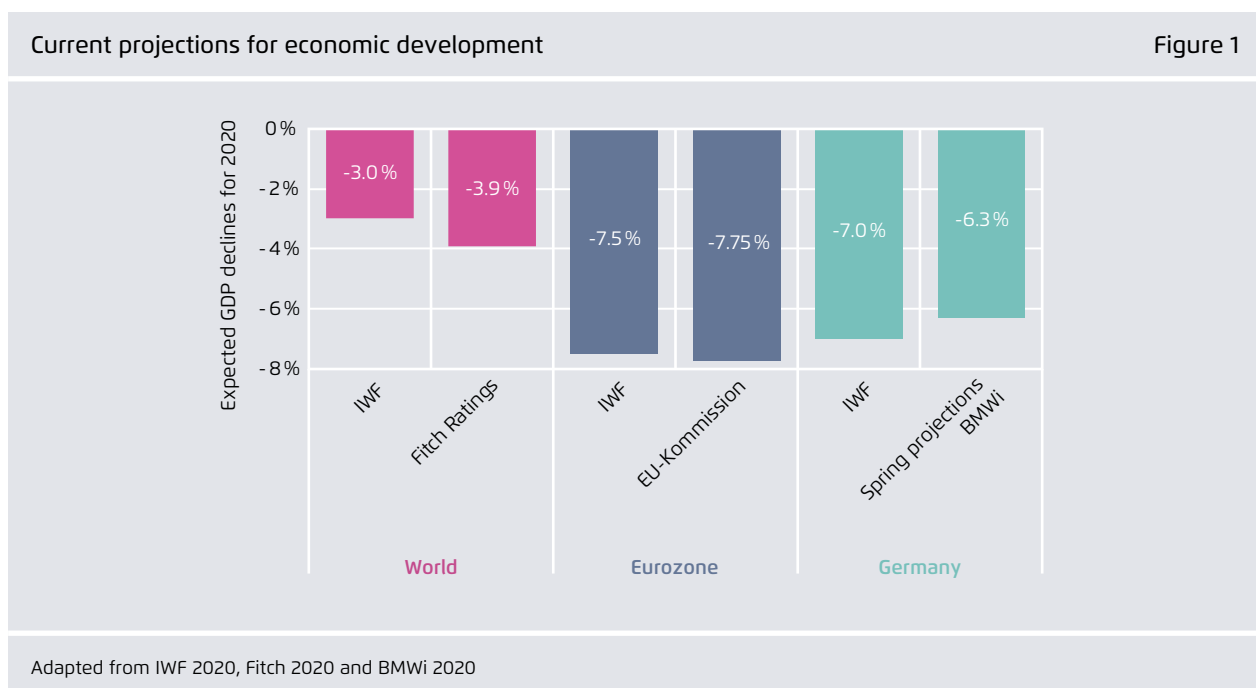
1 Introduction: Only a targeted stimulus programme can curb the economic fallout of the coronavirus crisis

1.1 The coronavirus recession

As we write these words, no one knows how long and to what extent the coronavirus pandemic will continue to affect economic and social life. But it is already clear that its effects will be far greater than those of past economic crises. Most economic experts agree that dramatic revenue declines in important economic sectors have already put Germany in a severe recession. In the *World Economic Outlook* from April 2020, the International Monetary Fund projects economic output to fall 3 percent globally. The eurozone and Germany are likely to see even greater decreases, at 7.5 and 7 percent, respectively. This represents the worst global economic crisis since the

Great Depression.¹ The German Economic Ministry expects that Germany’s GDP will drop by 6.3 percent this year and gains in the following year will only partly offset the losses. Figure 1 summarizes recent projections on economic development in three areas: the world, the eurozone and Germany.²

- 1 See <https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020>
- 2 See https://www.bmwi.de/Redaktion/DE/Downloads/G/gesamtwirtschaftliches-produktionspotenzial-fruehjahrsprojektion-2020.pdf?__blob=publication-File&v=6



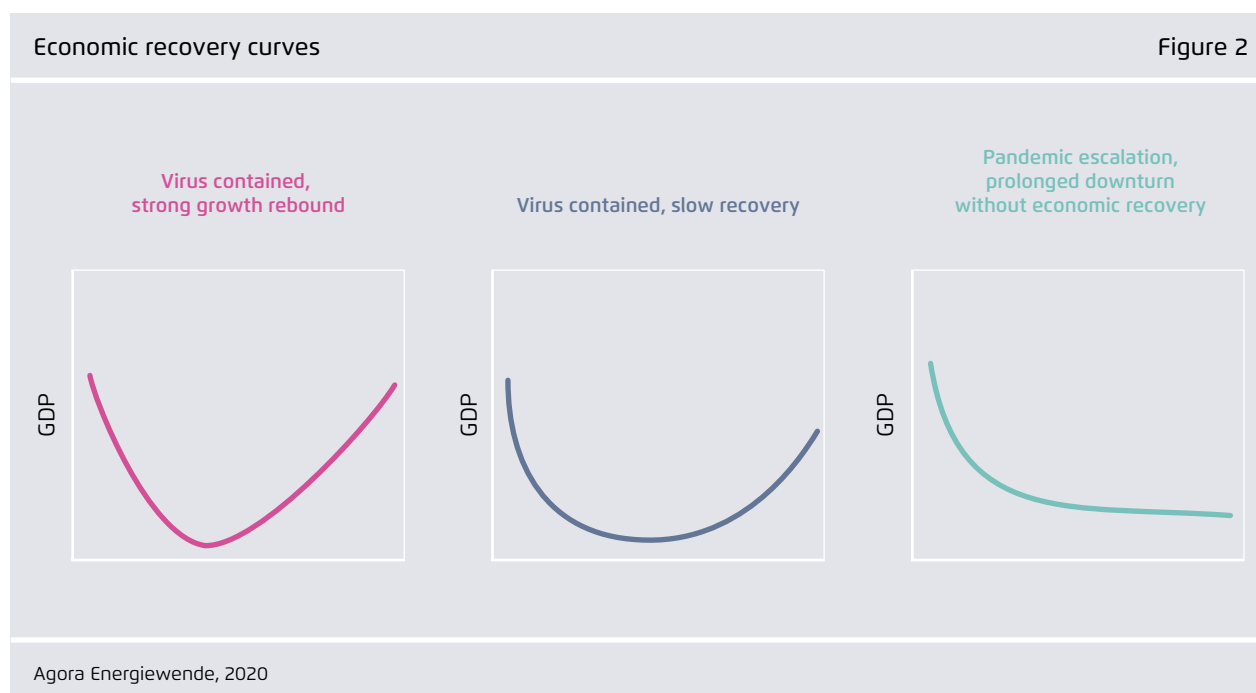
Besides the grim figures, there is concern that the economy will remain weak after the acute crisis ends given the global scale of the pandemic and its impact on many industrial countries and emerging markets. Many companies recently helped by injections of cash will struggle in the future as they use their earnings to pay back loans instead of reinvesting in their business. And there is a real risk that the shock for companies and consumers will continue to be felt post-crisis, resulting in a prolonged economic downturn. Finally, fear of additional systemic shocks is likely to significantly increase the demand for preventative measures that can forestall new crises down the line.

In sum, the crisis could lead to a longer period of increased uncertainty and weak economic activity. The likelihood that the economy will experience a quick V-shaped recovery is low. The shape of the recovery curve is more likely to be an elongated U or possibly even an L, stretching out over several years (see Figure 2). This would not only result in higher unemployment over the long term. It could also create

a shortage of funds for areas that were already considered urgent before the crisis hit. Examples include modernizing Germany's infrastructure, mitigating climate change and making Germany more resilient to future shocks.³

This is why it is crucial that we help the economy out of the abyss. In many ways, the task resembles Franklin D. Roosevelt's New Deal. The series of programmes enacted in the 1930s were also to overcome an acute economic crisis, modernize the country and make it more resilient to future shocks. The New Deal came in three phases: *relief*, *recovery* and *reform*.

3 Regarding the first two issues, the Cologne Institute for Economic Research (IW) and the Macroeconomic Policy Institute (IMK) recently proposed a ten-year public investment programme for Germany. See IW and IMK (2019): "Für eine solide Finanzpolitik: Investitionen ermöglichen." https://bdi.eu/media/presse/presse/downloads/20191118_IW-Policy-Paper_Investitionen.pdf



We believe that Roosevelt's three "R's" provide a useful framework for the actions we must take today:

1. *Relief* measures to attenuate the economic effects of the coronavirus crisis have already begun. In March 2020, the Bundestag approved a 350 billion euro aid package designed to provide a "protective shield" for the Germany economy. The package includes measures for liquidity support, loan guarantees and grant programmes.
2. *Recovery* measures will come after the government can ease social distancing enough so that businesses can open and manufacturers can start taking orders again. The measures must be quick to implement and large enough to be effective. Moreover, Germany must heed the lessons from its economic stimulus packages during the 2008–2009 financial crisis. In the sections below, we make several recommendations for the recovery measures needed most.
3. *Reform* measures are focused on the long term and aim to bring about structural changes that make Germany and its economy more resilient to future shocks. They range from health sector policy to the challenges of digitization and the environment. Especially when it comes to global warming, uncontrolled shocks with fatal consequences are a real and present danger.

In this paper Agora Energiewende and Agora Verkehrswende propose a growth and stimulus programme for economic recovery after the pandemic. The proposed measures are limited to our area of expertise. Additional proposals for measures in other key areas – such as digital technology and health policy – must come from experts in those fields. Voices in Germany and abroad have stressed that climate action must be at the core of a post-pandemic

growth programme.⁴ And the European Green Deal has provided clear objectives for the next decade. Meeting them will require massive public investment, similar in scope to those during the 1930s. But while Roosevelt's New Deal focused on new infrastructure and the electrification of rural communities, the European Green Deal is about expanding renewable energy, electrifying the power and transport sectors, introducing green hydrogen and establishing a circular economy.

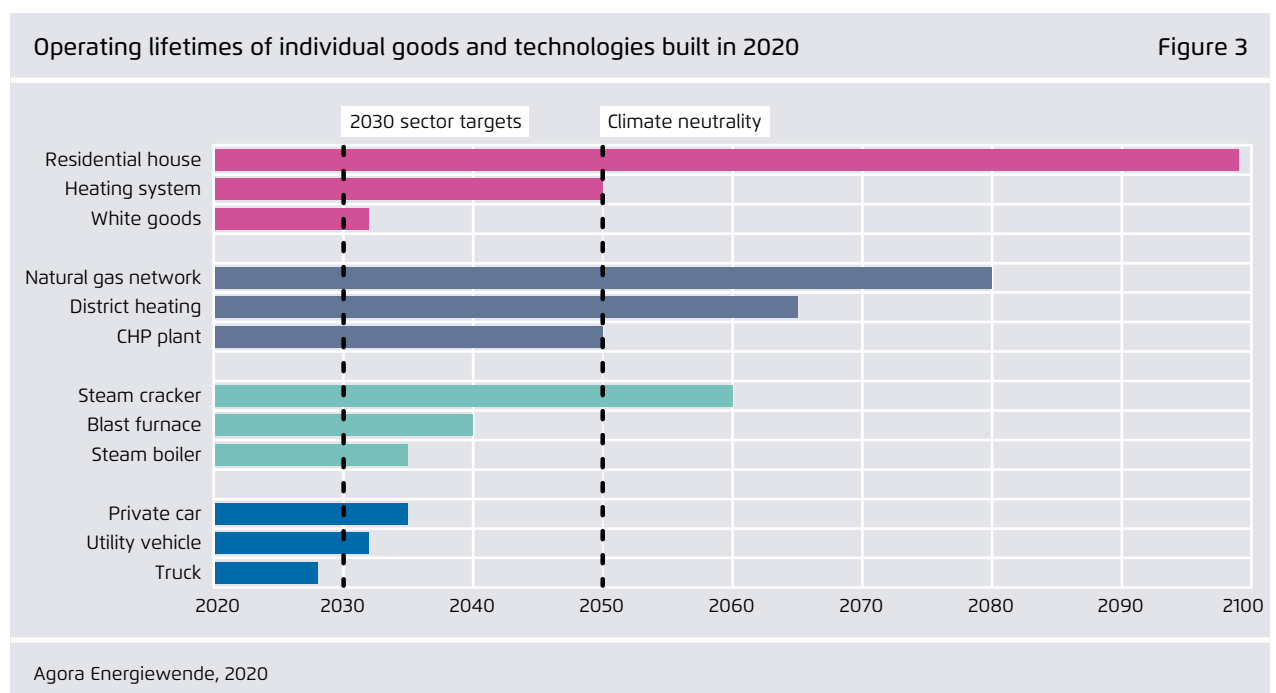
4 See International Energy Agency (2020): Put clean energy at the heart of stimulus plans to counter the coronavirus crisis (<https://www.iea.org/commentaries/put-clean-energy-at-the-heart-of-stimulus-plans-to-counter-the-coronavirus-crisis>); Wuppertal Institut (2020): *Folgen der Corona-Krise und Klimaschutz – Langfristige Zukunftsgestaltung im Blick behalten* (https://wupperinst.org/fa/redaktion/downloads/publications/Corona-Krise_Klimaschutz.pdf); Forum Ökologisch-Soziale Marktwirtschaft (2020): *Wie notwendige Wirtschaftshilfen die Corona-Krise abfedern und die ökologische Transformation beschleunigen können* (<https://foes.de/publikationen/2020/2020-03-FOES-Wirtschaftshilfen-Corona-Krise.pdf>); FiFo Köln (2020): *Von der Schwierigkeit, tragfähig in die Zukunft zu investieren. Und wie es doch zu schaffen ist. Plus Nachbemerkung: Zukunftsinvestitionen in Zeiten der Corona-Pandemie* (<http://www.fifo-koeln.org/images/stories/fifo-dp%2020-02%20thne%20zukunftsinvestitionen-corona.pdf>); Krebs, T. (2020): *Ein Konjunktur- und Transformationspaket für Deutschland*. (<https://makroном.de/corona-krise-ein-konjunktur-und-transformation-spaket-fuer-deutschland-35264>); Hallegatte/Hammer (2020): Thinking ahead: For a sustainable recovery from COVID-19, Worldbank Blog (https://blogs.worldbank.org/climatechange/for-a-sustainable-recovery-from-covid-19?cid=SHR_BlogSiteShare_EN_EXT).

1.2 Why climate neutrality must guide the economic stimulus

Some have argued that the government should put climate considerations on the backburner when devising a stimulus package. What's crucial, they assert, is to get the economy back on its feet as quickly as possible; only then should we worry again about the climate. But this argument overlooks the fact that while the effects of global warming will not become noticeable all at once, the challenge they pose is no less acute than that of the corona pandemic. From an economic standpoint, it is better to invest in the climate sooner than later. A number of climate measures can help with rebooting the economy right now.

A targeted stimulus and investment package must include sustainable climate action for three reasons:

- *Long-term effect:* The effects of economic stimulus programmes unfold over years, often even decades. If we respond first to the corona pandemic and only later to global warming, we risk saddling the climate with the long-term effects of a stimulus package geared solely on the economy (Figure 1). For instance, a scrappage rebate to promote new car sales would create another generation of fossil-fuel-guzzling vehicles. By contrast, a climate-friendly approach can modernise the passenger car fleet while moving the transport sector towards sustainability.
- *Steering effect:* Economic stimulus programmes provide incentives for investment and thus always steer developments in one direction or another. Every stimulus programme contains implicit decisions about which types of investment to encourage and which to discourage. At first glance, a programme that propagates the status quo might seem neutral, but de facto it entrenches the existing industrial system, much of which is not yet prepared to meet the challenge of global warming. Because the coronavirus crisis requires us to use tomorrow's investment resources today, we must also make tomorrow's investment decisions.
- *European Green Deal:* Investment incentives are particularly effective if they are in sync with the



EU. In December 2019, the European Council, the European Parliament and the European Commission agreed on the creation of the "European Green Deal", an economic framework for making the EU climate neutral by 2050. One month earlier, German legislators passed a sweeping climate package as they joined Europe in forging a common path for introducing economic measures needed to achieve climate neutrality. If Europe is to meet its 2030 climate targets – a 50 to 55 percent reduction of greenhouse gas emissions relative to 1990 levels – today's national and EU-level economic measures must also follow a common course. Fortunately, this is something that the EU Commission President Ursula von der Leyen understands. She recently tapped the head of EU climate strategy, Frans Timmermans, to lead the EU stimulus response to the crisis.

1.3 Large-scale, rapid, precise – the key features of effective economic stimulus

An effective forward-looking economic stimulus that secures existing jobs and creates new ones must satisfy five conditions:

- **Large-scale investment:** A small-scale stimulus will get lost amid the commotion of Germany's enormous economy and its practical effect will be minimal. If a stimulus is to have an impact – one that is psychological as well as economic – it must take place on a massive scale.
- **Speed:** The stimulus measures must have an immediate effect. One problem of Germany's community investment program from 2009 was that by the end of the year only 13 percent of its ten billion euro budget was spent. Such delays must be avoided in 2020.
- **Fresh, precise funding:** If the programme is to stimulate the economy, fresh money must be pumped into the system. The financial aid cannot be funded by tax increases or subsidy cuts else-

where. Moreover, it is important that stimulus policies minimise losses from increased accumulation of savings and deadweight effects.

- **Long-lasting effect:** The growth initiative must help increase investment in Germany. The Cologne Institute of Economic Research and the Macroeconomic Policy Institute determined that Germany will need investment totalling around 50 billion euros per year through 2030 to ensure that it is prepared for the future.
- **Resiliency:** A stimulus package must do more than boost economic activity. It must also be compatible with long-term goals. The programme we need now must help make society more resilient in the face of future crises. A central element in future resiliency is effective climate action.

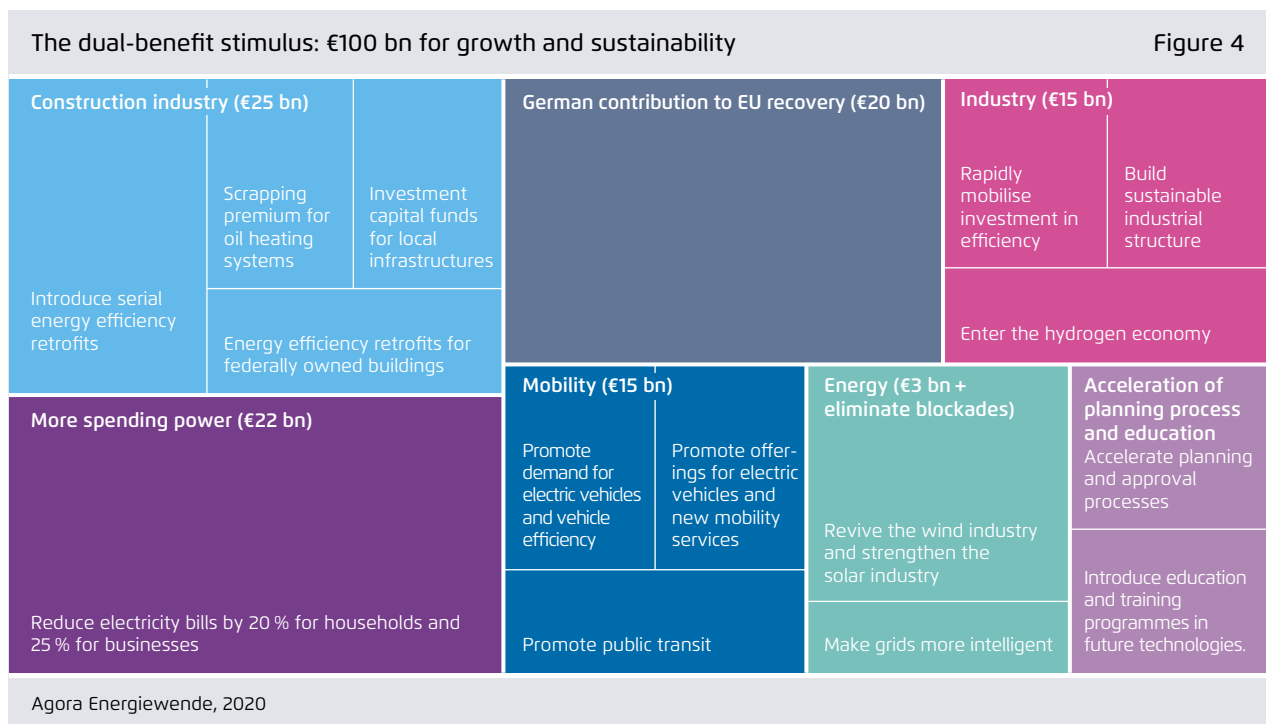
In 2009, the International Monetary Fund recommended that government stimulus packages for the financial crisis total 1.5 to 2 percent of GDP. The economic effects of the corona pandemic on the economy stand to be much worse than those of the 2009 crisis and therefore require a stronger response. The measures we propose total 100 billion euros, or 3 percent of Germany's GDP. Marcel Fratzscher, the director of the German Institute for Economic Research (DIW), believes even more will be necessary. In a recent interview, he called for an economic stimulus package of around 150 billion euros.⁵

Below we detail the individual components of our dual-benefit stimulus proposal. Figure 4 presents the core areas and their investment volumes. In sections 4–7, we identify targeted measures that sustainably strengthen the economy in four sectors. We have also made recommendations for boosting spending power (section 3) and for cross-sector measures that catalyse both the economy and climate action

5 See Marcel Fratzscher, "Frau Merkel, bereiten Sie den Ausstieg schon jetzt vor," interview by Florian Schmidt, t-online.de, 1 April 2020. https://www.t-online.de/finanzen/boerse/news/id_87631240/diw-oekonom-frau-merkel-bereiten-sie-den-ausstieg-jetzt-schon-vor-.html

(section 8). In section 9, we outline the German contribution to European economic recovery within the framework of the European Green Deal.

As we noted previously, our proposal does not specify the stimulus measures needed in digital technology and healthcare because they lie beyond our expertise, nor does it address the significant implications that the coronavirus pandemic has for international politics, development cooperation, international crisis prevention and the priorities of German foreign policy and national security.



2 For a smart recovery, invest in climate change mitigation now, not later

It is nonsensical to invest billions of euros to stimulate the economy if it means resuming our old environmentally harmful habits. This was the message of the EU Commission president Ursula von der Leyen during a video broadcast at the end of April. Under the precepts of the European Green Deal, the post-pandemic economic recovery must “bounce back better.”

An economic recovery based on old carbon-intensive technology would not only be bad for the climate. It would be very expensive as well. Many car manufacturers are already falling short of EU fleet-wide emissions targets and face stiff penalties as a result.⁶ Likewise, the German federal government will have to pay billions of euros in 2021 if it does not achieve EU climate targets for sectors outside the emissions trading system.⁷

Our proposal for a dual-benefit stimulus is, therefore, a recovery programme for handling the economic effects of the coronavirus that is also designed to initiate a reform programme for moving the economy towards climate neutrality. Accordingly, we identified proposal measures that lie within their intersection: investment that provides rapid economic stimulus during the crisis and puts Germany on the path to climate neutrality by 2050.

We selected climate policy instruments that bring the greatest benefits to the economy and to the industrial sector.

1. Provide relief now, introduce reciprocal financing

later. Most of our proposed reforms to energy and climate policy are revenue-neutral. This means that either relief or investment can receive the priority in the economic stimulus package. When the economic crisis is over, the measures can continue with the support of funding measures. Examples include:

- a. Carbon pricing (section 3): Lower electricity prices in 2020 (section 3) and pay for the cuts later with carbon price revenues. Combined with a subsidy programme, this would incentivise earlier investment in power-to-x technologies.
- b. Reform the vehicle tax (section 5): We recommend the introduction of a purchase rebate for low-emission vehicles now and an increased tax on high-emission vehicles after the crisis. This incentivises the purchase of low-carbon vehicles in the short term while safeguarding a funding source for the purchase rebate.

2. Invest now: Traditional stimulus programmes move ahead on or accelerate planned investment. A number of existing climate investment plans are suitable candidates for prioritization today: energy efficiency retrofits of public buildings (section 6), the expansion of the charging infrastructure (section 5) and the accelerated increase of renewable energy capacity (section 7).

3. Prioritize industry policy: Many climate change mitigation strategies focus exclusively on cutting carbon emissions. The instruments in our proposed recovery programme are designed for maximum effect on industrial policy. For instance, our “one-million heat pumps” programme aims to industrialize the production of heat pumps and our proposed market introduction of serial energy efficiency retrofits seeks to open new economic chances for companies with automated assembly lines (section 6).

6 See ICCT (2020): Market Monitor European Passenger Car Registrations, January–March 2020.

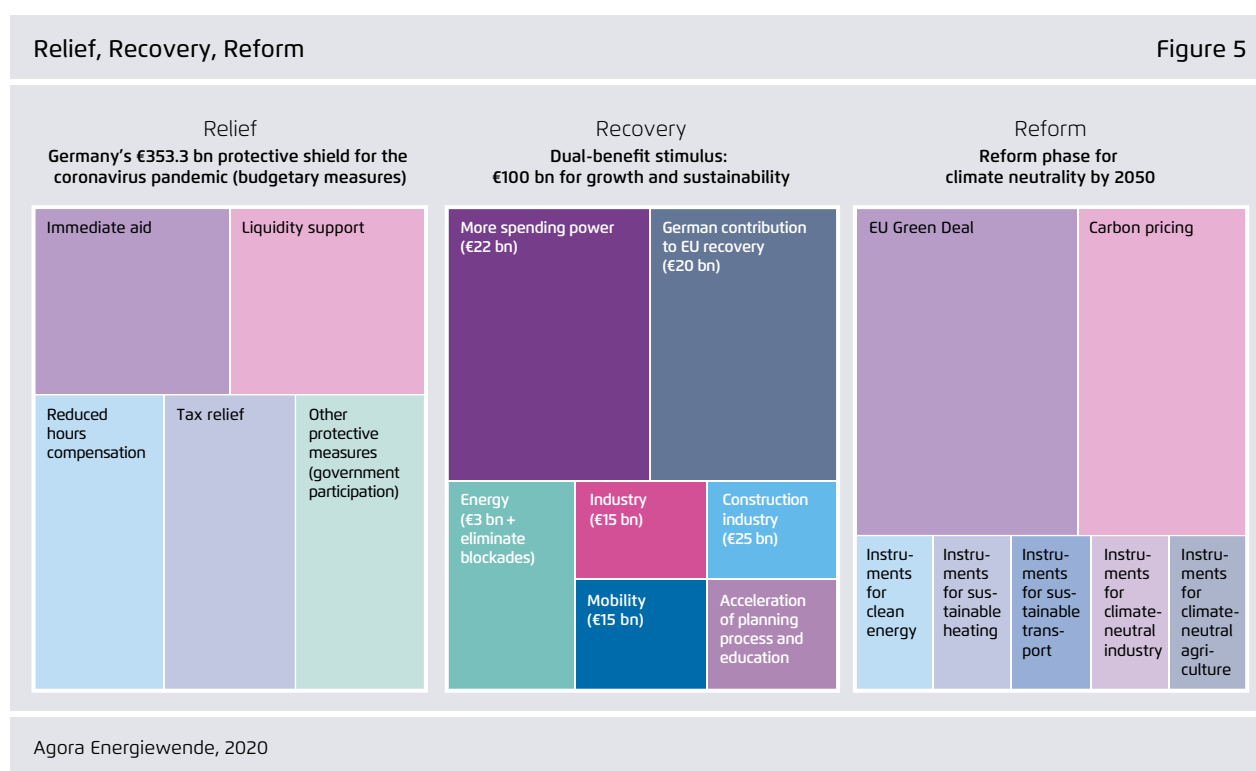
7 See Agora Energiewende/Agora Verkehrswende (2018): *Die Kosten von unterlassenem Klimaschutz für den Bundeshaushalt*.

4. Create investment security: In practice, the long-term measures that private-sector decision-makers count on can also bring about short-term investment decisions. A current example is the steel industry, which will soon invest in new plants and requires long-term security if it is to introduce climate-neutral technologies. It is thus important that Germany begins to prepare the infrastructure and other needed areas for a climate-neutral industry.

The measures we recommend for the recovery phase need to be followed by structural reforms for achieving climate neutrality. This will require a smart mix of instruments, including

- instruments to raise carbon prices in all sectors and redistribute proceeds to citizens and companies;
- instruments to accelerate the clean-energy transition and sector coupling such as a reform of surcharges and levies, a reform of the EEG, more

- construction of new wind and solar installations and the construction of new power grids;
- instruments to accelerate the transition to a sustainable transport sector such as changing the vehicle tax to a bonus-malus system, the national rollout of a charging infrastructure for electric cars, a reform of truck toll charges and the promotion of sustainable mobility in cities;
- instruments to accelerate the transition to sustainable heating such as the establishment of climate-neutral building standards, a legal solution to the landlord/tenant dilemma and preparing district heating systems to run on green energy;
- instruments to create a climate-neutral industry such as carbon contracts for differences, quotas for green hydrogen and a public procurement policy for innovative technologies; and
- instruments to create a climate-neutral agricultural sector such as soil rejuvenation and the reduction of livestock and nitrogen fertilizers.



Our proposal does not specifically address the reform phase measures; we have already made recommendations for them elsewhere.⁸ Nevertheless all our recommendations for economic stimulus are in line with the European Green Deal. As such, they should be extended beyond the recovery, allowing the effect of the dual-benefit stimulus to continue over the medium term. Of course, it would be counterproductive if our growth and stimulus initiative suspended existing climate policies – such as measures in Germany’s September 2019 climate package or the decision in December 2019 to increase the carbon price to 25 euros per tonne while lowering the EEG surcharge. This would incentivize the wrong sort of investment, one that would cost companies dearly over the next decade.

Our forward-looking recovery programme is also designed to pair easily with a relief phase. One measure would be to forgive a portion of the loans that companies receive for liquidity support provided that they agree to invest in climate change mitigation or energy efficiency. Another smart move would be to make bailouts for the airline industry contingent on the reduction of short-haul flights and on blending increasingly greater amounts of synthetic carbon-free fuels in aviation kerosene. As with the measures for a reform programme, our proposal does not specifically address measures for a relief programme, but our recommendations for the recovery phase serve as a perfect springboard between relief and reform. For an overview of the three phases and their measures, see Figure 5.

8 See Agora Energiewende/Agora Verkehrswende (2019): *15 Eckpunkte für das Klimaschutzgesetz*. The reform measures identified in the 2019 study represent the implicit long-term objectives of our proposed recovery measures.

3 Boost spending power by lowering the electricity tax (22 billion euros)

A classic approach to economic stimulus involves broad tax cuts that rapidly increase spending power. Typically, policymakers focus on income tax or value-added tax (VAT). But the most beneficial cut that Germany can make in 2020 is to its electricity tax, known as the EEG surcharge. Lowering the EEG surcharge by five cents per kilowatt hour will reduce electricity bills by around 20 percent for households and by around 25 percent for businesses. Several reasons speak for cutting Germany's electricity tax:

- **Fast-acting:** Everyone uses electricity. A reduction of the EEG surcharge will be most beneficial to households and small businesses, groups particularly hard hit by the coronavirus crisis. The tax cut will produce immediate savings, and the increased spending power will boost the economy.
- **Socially equitable:** Cuts to income taxes favour households with higher incomes. By contrast, an electricity tax cut is more socially equitable because poorer households have been shown to pay a higher share of their income for electricity.⁹
- **Fewer structural disadvantages:** Due to its many levies and surcharges, Germany has the highest electricity prices in Europe for households and non-energy-intensive industries. The situation is not sustainable and threatens Germany's appeal as a place for business. Since the EEG surcharge disproportionately affects small and medium-sized companies, an electricity tax cut will help them give the economy a boost.
- **Targeted incentives for investment:** In contrast to a reduction in VAT, a cut to the electricity tax incentivises investment. Germany's climate targets require massive investment in renewable electric-

ity for its transport, heating and industrial sectors. If this investment is to pay off, Germany must eliminate the high taxes and surcharges it levies on electricity. A cut to the electricity tax will make electric cars, heat pumps, hydrogen fuel cells and power-to-x systems more affordable and thereby encourage more investment.

In December 2019, Germany decided to use the revenues from the increased carbon price (25 euros per tonne instead of 10) to reduce the EEG surcharge by 1.5 cents per kilowatt hour starting in 2021. We believe that Germany must take quicker and bolder action. **Specifically, we propose that the EEG surcharge be reduced by 5 cents per kilowatt hour effective as of 1 July 2020.** For private households, this will also lower the VAT on the EEG surcharge, for a total reduction of 6 cents per kilowatt hour. The electricity tax cut will save households and companies around 8.5 billion euros in 2020 and around 12 billion euros in 2021. In addition, households will save around 1.5 billion euros in surcharge-related VAT. Over these two years, total spending power for households and businesses will increase by 22 billion euros. The electricity tax cut must be accompanied by a deal with Germany's main energy supplier organisations (BDEW, VKU and BNE) ensuring that energy companies pass on their savings to customers starting immediately on 1 July 2020.¹⁰ We suggest that the electricity tax remain in effect after 2022 but that the revenue losses be gradually offset by the higher CO₂ price planned by the Fuel Emissions Trading Act (*Brennstoffemissionshandelsgesetz*, or

9 See Agora Energiewende/Agora Verkehrswende (2019): *Klimaschutz auf Kurs bringen: Wie eine CO₂-Bepreisung sozial ausgewogen wirkt*.

10 Many have pointed out that an EEG surcharge funded partly by taxes would make the EEG subject to state aid. But this is already the case. The Fuel Emissions Trading Act stipulates that the carbon price be used to decrease the EEG surcharge. So a solution must be found either way. This is particularly important in light of the reform proposals for the state aid regulations. (See section 9.)

BEHG). It is crucial that the carbon price increase quickly again after 2022 in light of today's low prices for coal, oil and gas and the needed measures for climate neutrality.¹¹ Until the CO₂ price revenues from the BEHG fully offset the reduction in the EEG surcharge, Germany's state-owned KfW Development Bank can provide funding to make up the difference.

11 See Agora Energiewende (2018): *Eine Neuordnung der Abgaben und Umlagen auf Strom, Wärme, Verkehr*.

4 Lead the chemical, steel and basic materials industries on a sustainable path out of the crisis (15 billion euros)

Industry is a central pillar of the German economy. The manufacturing sector employs around 6.5 million people, some 550,000 in the basic materials industry alone. Particularly in times of crisis, the enormous value of integrated supply chains becomes readily apparent. There is little doubt that the economic recession triggered by the coronavirus will severely affect German industry as demand for basic materials and finished products weakens significantly both at home and abroad. In response, Germany has already introduced direct measures such as short-term working benefits and liquidity support plans. But it must also enact measures to steer investment towards future technologies.

The most beneficial step that Germany can take in the short term is to mobilise an investment offensive in energy efficiency. More investment in energy efficiency increases the competitiveness of German industry in the long run and directly stimulates the development and construction of energy efficient technologies. The efficient options today are well-known and can be deployed quickly when production capacities are weak.

Alongside the effects of the recession, much of Germany's heavy industry faces the challenge of having to replace aging plants over the next decade. For instance, around 50 percent of blast furnaces in the steel industry and 60 percent of steam crackers in the chemical industry will reach the end of their operating lifetimes by 2030. During severe crises like the current one, production capacities often decline, and do not return to pre-crisis levels for quite some time, even when the economic recovery is swift. The risk is that manufacturers will be unable to meet

future demand when it surges, allowing competitors abroad to pick up the slack.

4.1 Rapidly mobilize investment in efficiency (5 billion euros)

Underutilised production capacities do, however, present a unique opportunity: they allow manufacturers to exchange components and parts without production downtimes. An **investment offensive** should be undertaken to encourage manufacturers to swap old conventional parts for highly efficient pumps, fans, compressors and other cross-cutting technologies and to introduce processing heating systems powered by renewable energy. Efficiency measures will increase Germany's appeal as a location for industry.

The following policy instruments can create more efficiency in German industry:

→ **Stimulate investment in energy efficiency and renewable process heat:** The German government's climate legislation already sets aside money for investment in efficiency and renewable process heat. We recommend that Germany move up its existing investment schedule and increase its scope. Instead of an annual outlay of 150 to 200 million euros, it should make 500 million euros available in both 2020 and 2021. Furthermore, it must specifically encourage companies to adopt efficient climate-friendly technologies that can be used across the manufacturing sector, to limit and recover waste heat and to introduce process heating systems that run on renewables.

These measures will also boost demand in Germany's machine and plant construction industry.

→ **Accelerate tax write-off periods for investments**

in efficiency: Germany should accelerate the write-off periods for investments in plant modernisation (and, by extension, climate change mitigation) by five years. Specifically, the government should create a list of highly efficient machines and systems. Companies that invest in these goods should be able to write them off more quickly.

→ **Introduce competitive bidding for energy efficiency:** We recommend that Germany triple its current funding for the competitive bidding processes used to award support for complex energy efficiency projects (electricity and heating) in 2020 and 2021. The goal is to promote every viable application that is submitted during this period.

4.2 Rapidly build sustainable industrial structures (5 billion euros)

The steel, chemical, cement and other basic materials industries have to make significant new investment over the next decade. Since plants have operating lifetimes of 50 to 70 years, investment decisions must take into account the 2050 target of climate neutrality. If companies do not, they will risk losses from stranded assets. The economic crisis is likely to increase the need for investment, since old plants could be shut down in the event of a decline in demand. Without targeted support for the establishment of climate-neutral plants, Germany as well as Europe may slowly lose these industries – and watch as competitors abroad take their place, in all likelihood without concern for climate neutrality. This phenomenon is known as carbon leakage.

If Germany is to build climate-neutral plants, it will need a combination of policy instruments for mobilising investment capital, meeting long-term demand for low-emission products and funding additional

costs for carbon-neutral industrial production. These instruments encompass four basic mechanisms:

→ **Investment subsidies for the construction of industrial plants geared to the future:**

Heavy industries weakened by the crisis won't be able to invest in new manufacturing facilities without state aid. One specific measure we recommend is to increase **Germany's national decarbonisation fund by 5 billion euros**. This fund can then be used for grants of up to 50 percent of the total investment in sustainable production processes. The fund should focus on the development of direct reduction steelmaking, methane pyrolysis, e-crackers, plants for chemical recycling and the de-carbonation of demolitions in the chemical and cement industries.

→ **Green public procurement for building new infrastructure and modernising existing plants:**

As California did with its Buy Clean California Act, Germany should consider the embedded carbon emissions of construction materials when awarding contracts from competitive bidding. An intelligent public procurement program will generate predictable and reliable demand for climate-neutral steel, cement and chemical products. By minimising emissions from public procurement, it can create incentives for climate-friendly technologies that utilise the competitive forces and efficiency pressures of the free market economy.

→ **Carbon contracts for difference:**

Today, low-carbon and climate-neutral basic materials such as steel, cement and polymers are significantly more expensive than conventional materials. This is mostly due to the higher operating costs of their manufacturing. Without indemnifying companies for the higher production costs, there will be no business model for climate-neutral technologies and investment in sustainable plants will not take place, even with generous investment grants from the state. Part of the additional costs can be offset by the carbon price imposed by the EU Emissions Trading System. We recommend that the remaining costs be borne by carbon contracts

for difference (CfDs), which compensate manufacturers for the higher price of producing climate-friendly materials. If the national decarbonization fund leads to the construction of factories for climate-neutral steel or plastics, they will not start production before 2023, but they will need market security by 2021. Achieving it requires a legal framework that defines the regulatory procedures, the competitive bidding process and the funding of carbon contracts for difference starting in 2023. Potential funding sources are the EU Innovation Fund, the energy and climate funds of the German federal government and/or a climate surcharge.

4.3 Invest boldly in green hydrogen (5 billion euros)

As the German federal government stresses in its hydrogen strategy plan, the hydrogen economy is a key future technology for climate neutrality in Germany and around the world. Rapidly building a hydrogen industry will help German chemical plant construction companies through the crisis, secure jobs and open up export opportunities. In addition, green hydrogen – hydrogen obtained from renewable electricity – is central to the reduction of emissions in Germany's chemical and manufacturing industries

Case in point: The steel industry

Germany's steel industry is a prime example of profound economic vulnerability during the coronavirus pandemic. But it also shows that the crisis can be an opportunity for speeding up the transition to sustainability. In 2017, German steelmakers produced 42 million tons of steel, generating a gross value added of 6.8 billion euros and employing 75,000 people. The industry's economic strength is more fragile than it first appears, however. Seventy-five percent of steel demand in Germany comes from the construction, automotive and machine manufacturing industries, which are cyclical and prone to crisis. Falling orders in the automotive industry alone could have dramatic consequences for primary steel manufacturers. At the same time, 50 percent of the German steel industry's coal-fired blast furnaces – responsible for emitting 57 million tons of CO₂ each year – have to be replaced over the next decade. As demand drops due to the economic crisis, the industry expects that some blast

furnaces slated for replacement will go offline earlier than planned. This presents a major opportunity to prepare the German steel industry for a climate-neutral future today. Steelmakers can replace the old blast furnaces with direct reduction units fuelled by natural gas, significantly reducing CO₂ emissions. Moreover, if the direct reduction furnaces switch to green hydrogen down the line, the steel industry stands to achieve climate neutrality by 2050. The likelihood of lower natural gas prices in the future will facilitate this transformation. Nevertheless, the steel industry will need a total investment of around 8 billion euros to start the transition. Direct reduction furnaces in the steel industry would serve as a lynchpin to the development of a hydrogen economy. Moreover, the use of zero-carbon steel would give the German automotive and machine manufacturing industries a unique selling point as more and more countries embark on the path to climate neutrality.

and in parts of its transport sector. The generation capacity of power-to-gas projects in Germany is currently 50 megawatts. The government plans to increase installed capacity to 10 gigawatts by 2030. Additional investment incentives are urgently needed, however. Green hydrogen is not yet competitive due to its high investment and electricity costs. We recommend that Germany address this problem in the medium term by introducing either quotas or a competitive bidding system. Ideally, the mechanism can be coordinated across Europe. Finally, Germany needs to open energy industry law for all forms of zero-carbon hydrogen and their transport and reinforce the existing privileges for green hydrogen.

In the short term, power-to-gas plants need investment support. As with the national decarbonisation fund, we recommend the allocation of 5 billion euros for funding grants of up to 50 percent of the total investment in hydrogen plants and electrolysis plants. Electrolyser capacity will be auctioned in places that reduce grid loads and linked with the creation of new onshore and offshore wind installations. The electrolyzers will use around 20 terawatt hours of additional renewable capacity beyond what would otherwise have been integrated into the power grid. Even with the availability of investment grants, electrolyzers are not economical to operate due to the levies and surcharges on electricity. Therefore, we recommend the introduction of an experimentation clause that exempts power-to-gas plants from all levies and surcharges on electricity until Germany achieves a total installed capacity of one gigawatt.

4.4 Industrial electricity prices based on renewables

Large volumes of renewables are needed for an energy- and cost-efficient decarbonization of German industry. The demand can lead to new investment in renewables via power purchase agreements outside the framework of the EEG. A certificate can be issued to industrial companies giving them access to low-cost green power exempt from the EEG. Moreover, legislators can modify the funding guidelines for state aid regarding indirect carbon costs so that industrial electricity price compensation applies to renewable electricity as well. They must also ensure that new renewable production facilities can link up to the power system in a way that serves the grid. Among other factors, this includes proximity to major industrial consumers. A pilot project should be introduced to find out whether grid-friendly integration of additional renewable capacity is achievable.

Moreover, the flexible and efficient use of power must continue to be a number-one priority in industry. To encourage this, flexible power consumption must make economic sense. Adjusting the grid-fee system can send undistorted electricity price signals to consumers. The first step is to reform the existing exceptions in the EEG, KWKG and grid fees to eliminate impediments to investment in efficiency and flexibility. Possible exceptions include 7,000-hour thresholds, demand peaks in times of negative electricity prices, and power cost intensity.¹²

12 See Connect Energy Economics (2015): Aktionsplan Lastmanagement: Studie im Auftrag von Agora Energiewende; and Ecofys (2016): Flex-Efficiency: Ein Konzept zur Integration von Effizienz und Flexibilität bei industriellen Verbrauchern.

5 Lead the automotive industry and the mobility economy on a sustainable path out of the crisis (15 billion euros)

The coronavirus crisis has jeopardized the economic foundations of Germany's mobility sector and with it the success of efforts to create a sustainable, climate-neutral transport system. On account of the pandemic and the government measures to contain it, demand for products and services in the mobility economy has taken a huge hit. Moreover, rules for social distancing and the likelihood of an ongoing risk of infection are endangering public transit's role as the backbone of the transport transformation. To lead the mobility sector out of the crisis, Germany needs fast-acting stimulus measures followed by long-lasting structural reforms. Without the latter, it will not be possible to safeguard the positive climate effects of the former.

When it comes to rejuvenating the economy, a particularly important focal point is Germany's massive automotive industry. Even before the coronavirus pandemic erupted, car manufacturers were facing major challenges as the diesel emissions scandal, stricter emission limits, digital technology and new mobility services eroded the viability of their traditional business model: the production of gasoline and diesel vehicles. Today's economic stimulus for the automotive industry must look forward. This means passing measures to accelerate electrification and promote the demand for and supply of electric mobility. At the same time, the government must avoid policies that further delay the switch to alternative drive systems. (See the infobox below.) An innovative German automotive industry focused on the transport transformation not only has better prospects for long-term economic success; it will help Germany reach the climate targets set by the European Green Deal.

Beyond the urgent stimulus for the mobility economy, there are important measures that are essential for the success of the transport transformation, even if they only indirectly contribute to economic recovery. To ensure the sustainability of the transport sector, the government must pass an aid package for public transport companies. The purpose should be to safeguard the continued operation of public transit systems so they are in place when public life resumes. The package should also include additional railway investment, as demanded by Germany's Climate Action Programme 2030. It is very unlikely that railway investment will provide short-term economic stimulus, however. Even projects whose funds have already been earmarked face significant delays.

5.1 Promote demand for electric cars and efficient internal-combustion vehicles

→ Higher purchase rebates on all-electric cars¹³:

The federal government should temporarily raise purchase rebates on battery-electric cars from 6,000 euros to 8,000 euros for vehicles with a net price of up to 40,000 euros and from 5,000 euros to 6,000 euros for vehicles with a net price between 40,000 euros and 65,000 euros. A total budget of one billion euros should be set aside for the increase in rebates for electric vehicles. As car purchases should generally not be subsidized by all

¹³ Policymakers need to check whether special funding lines for carsharing companies and fleet operators (e.g., taxi companies) – including, if needed, modified funding rates to cover increased operating costs – can accelerate the modernisation of car fleets.

taxpayers, the rebates should be funded by a bonus-malus system (see below). The increase should remain in effect until the middle of 2021 or until the budget is exhausted and then reassessed. Applications should be approved on a first-come, first-served basis. The increased rebates should be guaranteed at the completion of sale if vehicle registration must be postponed on account of supply bottlenecks or delivery delays. (Buyers should receive rebates as long as registration takes place by the end of 2022.) The guarantee improves planning security for companies and stimulates the ramp-up of production capacities for electric vehicles.

→ **Purchase rebates for plug-in hybrids contingent on the use of electric mode:**

The federal government should also temporarily increase purchase rebates for plug-in hybrids (PHEVs) from 4,500 euros to 6,000 euros for vehicles with a net price of up to 40,000 euros and from 3,500 euros to 4,500 euros for vehicles with a net price between 40,000 euros and 65,000 euros. Because plug-in hybrids are heavy, they consume more fuel than traditional vehicles when using their combustion engines. Furthermore, experience has shown that owners of plug-in hybrids rarely run them in all-electric mode. Accordingly, we propose that buyers receive only half of the rebate up front and that the second half be contingent upon an inspection of the vehicle, either with the regular inspection after three years or on occasion of a change of ownership, but not earlier than two years after the initial registration. The complete rebate is only granted if the on-board computer shows that at least half of the total distance travelled was completed in all-electric mode or that average CO₂ emissions per kilometre travelled is less than 60 grams.

→ **Expansion of purchase rebates for possibly 100,000 utility vehicles up to 7.5 tonnes:**

We propose raising the existing rebate for class N1 and N2 commercial vehicles up to a total weight of 4.25 tonnes and extending them to all electric commercial vehicles up to 7.5 tonnes. The existing

rebate for vehicles up to 4.25 tonnes should be increased to 10,000 euros. The new rebate for vehicles up to 7.5 tonnes should be set at 12,000 euros. The additional funding can be easily supplemented by support from German states. The rebate programme is designed for companies and small businesses, organizations and associations. As with cars, purchase rebates should be guaranteed in the event that delivery and registration are delayed. Moreover, we recommend that the national subsidy for cargo bikes should be extended to all types and applications, including leasing models, with purchase rebates of up to 2,500 euros

→ **Up to 200,000 additional charge points for private households and workplaces:**

Partial subsidies for charge points for private households, workplaces and utility vehicle depots should be increased by up to 500 million euros. Germany's Climate Action Programme 2030 has already earmarked over three billion euros for the expansion of the public charging infrastructure. But it only reserves 50 million euros for charge points at home and at work.

→ **Competitive innovation for rural mobility:**

The government should institute a 500 million euros programme that funds up to 100 innovative pilot projects for rural mobility. The purpose of these projects is to demonstrate that integrated mobility concepts that include electric vehicles, the (decentralised) production of renewable energy, energy storage systems and digital technology can improve rural mobility while making it more sustainable. Such innovation will strengthen rural areas and keeps them attractive as places to live and work.

→ **Introduce a bonus-malus system with immediate rebates for efficient internal-combustion vehicles:**

The federal government should reform the vehicle tax system by introducing a bonus-malus system before the end of this legislative period. For emission-intensive vehicles, the vehicle tax should be increased significantly (malus), especially in the year of initial registration; for highly efficient, low-emission vehicles, the acquisition

should accordingly become cheaper (bonus). To stimulate the economy in the short term, we recommend that the bonus mechanism be introduced in advance, before the full programme comes into effect and the malus funding kicks in. This kind of bonus funding can be made revenue neutral, thereby not burdening taxpayers. Vehicles

with emissions up to 110 grams of CO₂ per kilometre based on the WLTP standard (around 95 grams using the NEDC procedure) should receive a rebate of up to 1,500 euros, with rebate levels increasing as emissions decrease.

Weaker emission standards, scrappage schemes, blanket subsidies: prolonging the past instead of promoting the future

Among the stimulus measures under discussion for the automotive industry are several that point in the wrong direction: easing EU rules on fleet emissions, promoting conventional car purchases in an undifferentiated manner and scrappage rebates. But enacting measures that artificially prolong the use of the outdated internal-combustion technology on supposedly pragmatic grounds would be a fatal mistake and only further delay the transition to electric engines.

The EU has committed itself to achieving climate neutrality by 2050. Its interim targets guide industries as they start down the path towards sustainability. For cars, whose lifespans average 15 years, this means that soon after 2030 emission values for new vehicles must drop to near zero. EU-wide fleet emission rules stipulate that by 2021 average emissions for new cars may not exceed 95 grams per kilometre travelled. By that point, German car manufacturers will have had to significantly ramp up their electric vehicle production. The stimulus package should accelerate the reorientation of the car industry, already begun with massive investments, towards electric vehicles. Easing EU CO₂ emission standards might benefit manufacturers in the short term, but the long-term costs would be steep since delays in the development of electric vehicle production

would jeopardize their competitive position internationally.

The vehicle rebates in this proposal apply to new purchases. During the 2009 financial crisis, Germany tied purchase rebates to the scrappage of old vehicles. The measure had no environmental benefit whatsoever. Scrappage schemes are most likely to have a positive effect – especially on air quality – if they are targeted towards the oldest and most polluting vehicles and if they are not made dependent on the purchase of a new vehicle. The second condition is because owners of very old vehicles typically cannot afford to purchase a new one, even if it comes with a rebate. Therefore, purchase rebates for vehicles should be considered only in isolation.

Funding programmes that subsidize all vehicle purchases regardless of their emissions will not help the transport sector reach its climate target. A particularly problematic measure – more so than purchase rebates for conventional cars – is the temporary reduction of VAT on all new vehicle purchases. Not only would it lack an environmental steering effect; it would also be unfair because buyers of expensive vehicles would save the most in absolute terms.

5.2 Promote supply of electric vehicles and new mobility services

→ **More state investment in battery and fuel-cell production:**

Germany's domestic battery production is already unable to keep up with demand. We propose that investment aid and additional funding is made available for creating and expanding industry clusters along the entire battery value chain, from cell manufacture and battery assembly to power electronics and recycling. Moreover, Germany should increase its funding for research on traction batteries and battery cells by one billion euros.

→ **State investment funds for start-ups:**

The German government establishes an investment fund for new mobility totalling five billion euros for the duration of the stimulus programme. The fund can help create reliable jobs in Germany to offset possible job losses in the automotive industry. Compared with other countries, start-ups in Germany often lack venture capital or state funding. The federal government should thus work to maintain start-up funding after the stimulus programme and increase it if needed.

→ **Training programmes in the automotive industry:**

The German federal government and the states must financially support training programmes in the automotive industry via, say, regional transformation plans and/or training hubs. Technological transformation in the automotive industry is accompanied by foundational changes in value chains and employment. (See also section 8.1.) We must take advantage of weak demand to retrain parts of the workforce, make jobs future-proof and expand electric vehicle production capacity.

→ **Innovation corridors for the trucks of the future:**

We recommend that the German federal government build three 300–500-kilometre innovation corridors along federal highways, one each for the most promising alternative truck propulsion systems and their respective infrastructure: electric trucks powered by overhead catenary lines; fuel-cell-powered trucks with a hydrogen

fuel station network; and battery-electric trucks in combination with ultra-fast charging stations. Potentials for the electrification of freight transport can also be tapped by optimized intermodal logistics processes. An innovative logistics concept should therefore be developed for combining freight transport by rail and distribution transport with battery-electric trucks. The programme funding should be as high as 3 billion euros to support both infrastructure expansion and vehicle acquisition.

5.3 Fund public transit and infrastructure

→ **Fund modern bus systems for sustainable transport in cities:**

The federal government and cities must set aside 500 million euros to promote the expansion of bus systems in up to ten cities. Bus lines with segregated busways – known as “trams on wheels” – can be built faster and more cheaply than tram lines. They enable the short- and medium-term creation of public transport capacity, which is urgently needed to meet growing demand. This is not only true for inner cities but also for commuters from urban peripheries. Moreover, existing funding for electric buses and their electricity supply should be increased to 150 million euros per year.

→ **Start a digitalization offensive in the public transit sector:**

The federal, state and municipal governments should reserve up to one billion euros for funding ten initiatives linking traditional public transport with modern mobility services (micromobility services; bike-, car- and ridesharing; pooling) and digital route planning. A key aspect of these initiatives is cooperation between departments of transport, public transport companies and private mobility service providers. The resulting “mobility alliances” can work to increase the attractiveness of public transport after the corona crisis.

→ **Expand personnel for transport planning and approval procedures:**

The federal, state and municipal governments should add personnel for planning and approving transport infrastructure. The national need for personnel should be determined before rolling out the economic stimulus package. The added personnel are needed to process public investment in transport infrastructure and implement important parts of the Climate Action Programme 2030.

The temporary stimulus measures identified above will have a long-lasting positive effect on competitiveness, transport transformation and climate protection only if the relevant policy frameworks are reformed in the future. A central part of these reforms is ambitious carbon pricing in the transport sector and the elimination of special diesel tax exemptions. In light of the dramatic fall in oil prices, it is important that Germany gradually dismantle subsidies for fossil fuels and technologies. Doing so would avoid undesirable developments for vehicle fleets and driving performance while strengthening domestic value creation. The generated additional funds could be used for the Climate Protection Programme 2030 or climate-friendly economic stimulus in the transport sector.

As mentioned earlier, we also need a fundamental reform of vehicle circulation tax towards a bonus-malus system to ensure the success of climate protection in the transport sector. In addition, there is a need for reform in the taxation of company cars: Vehicles with high CO₂ emissions, including plug-in hybrids that are hardly used in all-electric mode, may no longer enjoy any tax privileges in the future. In the coming years, a use-based car toll can be a key instrument for controlling road traffic and its effects on climate and the environment.

The granting of state funding for modernizing the car fleet should be linked with the gradual implementation of low- and zero-emission zones. Examples in European cities show that these zones are an effec-

tive instrument to quickly reduce greenhouse gases and air pollutants. Moreover, they also serve to modernize car fleets. The German federal government needs to create simple, uniform and legally sound procedures for introducing low- and zero-emission zones and monitoring emissions.

The market launch of alternative propulsion technologies for heavy road transport should be accompanied by the reform of the truck toll. Future toll rates should take into account carbon emissions through an additional cost component, while investment in energy supply infrastructure should count as part of road costs. The truck toll should be extended to all roads and additional vehicle classes and the prerequisites for the measures should be created as part of the revision to the Eurovignette Directive. Finally, the revenues from the truck toll should also be used for expanding the railway infrastructure. ("Streets fund mobility.")

6 Lead the construction industry and heating sector on a sustainable path out of the crisis (25 billion euros)

The corona crisis will heavily impact contractors and the construction industry in general. Prior to the crisis, the construction industry was operating at full capacity and tended to struggle with finding enough skilled workers. We can expect a dramatically different environment for the industry following the crisis. Judging by past experience, the general collapse in demand will lead to a reluctance on the part of firms to engage in investment activities, which will negatively impact the volume of commercial construction projects. At the same time, people are unlikely to build a house or start a home renovation if they are facing the possibility of unemployment or – in the case of small business owners – the possibility of cratering revenues. In addition, the declines in the stock market over the past few weeks have destroyed an enormous amount of wealth. This, as well, will undermine investment activity.

The forward-looking stimulus measures we propose for the building sector will enable the construction industry to weather the crisis while encouraging investment in new capacities in the heating system manufacturing and construction industries. Specifically, we advocate providing support for three technologies that will be essential for a successful transition to sustainability in the building sector: energy efficiency retrofitting; heat pumps for detached and semi-detached homes; and green district heating in urban areas. Existing analytical forecasts confirm that the production of these three technologies will have to experience a massive expansion for the goal of a climate-neutral building stock to be achieved.¹⁴

14 See IFEU/Fraunhofer IEE/Consentec (2018): *Wert der Effizienz im Gebäudesektor in Zeiten der Sektorenkopplung*. Study conducted on behalf of Agora Energiewende.

depending on the scenario, annual heat pump and building insulation sales would need to double or triple up to 2050. Over the coming three decades, district heating networks would also have to connect at least 50,000 customers each year. To enable this expansion, new industry capacities need to be developed.

6.1 Develop serial production for energy efficiency retrofits and potentially expand existing support programmes (10 billion euros)

It is still uncertain how exactly the crisis will affect the construction industry. As demand for construction contractors has remained relatively strong, an emphasis should first be placed on developing capacities for the greater standardisation of energy efficiency retrofits. With the exception of pre-fab new home construction, the techniques associated with serial production have made little headway in the construction industry. In the area of energy efficiency, however, these techniques have significant untapped potential. The Dutch, for example, have developed a concept for buildings called *Energiesprong*. Leveraging the power of digital tools and industrial manufacturing processes, *Energiesprong* allows buildings to be quickly and inexpensively retrofitted to the net-zero standard. Net-zero buildings are able to cover all of their own annual energy needs (including space heating, hot water heating and electricity consumption).

In Germany, the Federal Ministry for Economics and Energy operates a programme to encourage innovation in this area. The market introduction of associated solutions is being coordinated by the German

Energy Agency. In November 2019, a collaborative deal was reached between 22 real estate companies for the refurbishment of 10,000 housing units. The goal at present should be to accelerate market penetration and achieve the milestone of 100,000 housing units. Application of *Energiesprong* techniques at this scale would accelerate cost reductions while creating the needed industrial capacities and structures. Serial production for energy efficiency retrofits represents a potential growth market not only for the construction industry, but also for innovative SMEs and firms in other industries that engage in serial production. One good example is the automotive parts industry, which should harness this moment to usher in structural change, particularly because it will soon face mandatory restructuring anyway to facilitate the rise of electric vehicles.

In order to induce exponential growth in serial production for energy efficiency retrofits while triggering innovation in the construction industry, over a five-year period the federal government should issue a call for bids for the refurbishment of 100,000 housing units in accordance with the KfW 55 standard. 2021 should be set as the start year for refurbishment activities, and the size of the government subsidy should be up to 100,000 euros per housing unit. The goal should be not only to make housing units more energy efficient but to enable the German construction industry to develop full-fledged "home retrofit factories". To this end, the government should be willing to extend assistance to a range of actors at different locations, from innovative SMEs providing individual components to large-scale producers. Once the crisis is over, the production capacities that have been developed can then be used to offer a range of energy efficiency solutions both in Germany and abroad.

If the economic crisis negatively impacts the construction industry as well as contractors/tradesman, then over the course of 2020 the government should implement a **special programme for energy efficiency retrofits** to harness idle capacity in the construction

sector to place in the service of climate protection, thus generate dual benefits. In this connection, the percentage of expenditures that qualify as tax deductible should be doubled from 20 to 40 percent for a period of two years. At the same time, the maximum subsidy amount per property should be increased from 40,000 euros to 80,000 euros. To ensure consistency between subsidy measures, the support provided by the renewable energy incentive programme and by KfW should be increased by 20 percentage points each. Furthermore, property owners should be enabled to take advantage of tax benefits and other support measures when conducting renovations to ensure adherence to mandated efficiency requirements. As an additional measure, all property owners should be allowed to take advantage of energy efficiency support measures, not just owner occupants, as is the case at present. Lastly, energy efficiency retrofits for low-income residential units should receive particularly advantageous subsidy conditions.

6.2 The one million heat pump programme (5 billion euros)

The federal government should considerably augment its existing support mechanism for heat pumps to target households that wish to replace their old oil heating systems, as part of a one-million heat pump programme: In order to engender a strong jump in the uptake of heat pumps in residential and non-residential buildings, the federal government should cover 50% of the costs associated with heat pump installation, including drilling, heating system conversion and other necessary work, in 2020, 2021 and 2022. The government should continue to provide this support until one million new heat pumps have been installed. Heat pumps are an extremely efficient source of renewable energy, and robust government support, in combination with lower electricity costs (see section 3) will make them very attractive to consumers.

In terms of industrial policy, the goal of the programme should be to triple production from its current level of

300,000 units per year. This will considerably reduce production costs, due to capacity expansion and associated economies of scale. As heat pumps become a key technology for the generation of carbon-neutral heat in detached and semi-detached homes throughout Europe, accelerated heat pump adoption will create significant opportunities for German industry. By way of example, the Netherlands is planning to massively expand reliance on heat pumps, and recently banned the installation of gas-fired boilers in newly constructed residential real estate.

6.3 Promote the expansion of green district heating (5 billion euros)

In the future, a large share of the German populace will obtain energy for space and water heating from local and district heating networks. These green heating networks will be particularly prevalent in cities, where the population density is higher. The carbon-neutral heat that is fed into district heating networks will be primarily obtained from industrial heat pumps, solar thermal and geothermal systems, waste heat from incineration plants and other industrial facilities, and combined heat and power plants (when output from sun and wind is low).

To construct, expand and decarbonize district heating networks on a large scale, the budget for the existing federal support programme should be enlarged, and new provisions should be added. When local actors, such as municipal utility providers, lack sufficient capital to conduct investment, they should receive support from an equity investment fund. When new district heating networks are constructed, the number of connected customers is small at the outset, making them unprofitable. To address this problem, loans provided by the KfW development bank should be designed such that the debt service payments increase in line with network size.¹⁵

15 See Agora Energiewende (2019): *Wie werden Wärmenetze grün?* Presentation given on 21 May 2019 at the conference "Berliner Energietagen".

6.4 Energy efficiency retrofits for federally owned properties (5 billion euros)

The federal government has declared the aim of refurbishing federally owned properties in order to make them more energy efficient. The Climate Protection Programme 2030 contains a provision for federal buildings to serve as "role models of efficiency". However, an annual retrofit target has not yet been set. The federal cabinet will determine a retrofit target within the next three months. We recommend a doubling of the retrofit rate witnessed in recent years starting in 2021. The targeted retrofit rate for 2022 should be even higher. Furthermore, the KfW 55 standard should be adopted as the required norm for refurbishment activities. These measures will enable existing retrofit plans to be implemented at an accelerated pace and provide considerable stimulus to the construction sector in 2021 and 2022. As an additional measure, the federal government should provide support to states and municipalities that undertake the energy efficient refurbishment of government buildings based on the KfW 55 standard, provided that work begins prior to the end of 2022. To this end, one could reduce the percentage of the funding borne by municipalities for energy efficient retrofits as part of the existing support programme.

In addition, within the scope of their stimulus programmes, the federal government and states must address the current lack of personnel for managing and implementing such retrofit projects. This will help to avert the problems previously encountered following similar stimulus measures that were passed in 2009 – namely, the bottlenecks that developed in the disbursement of funds, as well as the poor quality of some retrofit work.

7 Lead the energy sector on a sustainable path out of the crisis (eliminate roadblocks, plus 3 billion euros from the federal budget)

The energy sector will play a crucial role in the carbon-neutral economies of the 21st century. Various factors will cause electricity demand to rise in tandem with increasing decarbonisation, including the broader adoption of electric vehicles, heat pumps and synthetic fuels, as well as the electrification of industrial processes. Hydrogen will gradually supplant natural gas in a range of applications. The energy economy has a bright and dynamic future, as green technologies will gradually transform existing energy systems.

However, the current climate for investment in green technologies remains poor, and total investment volumes remain low. The renewable energy branch – including in particular the wind power industry – has been suffering from a lack of political support at the federal level, leading some business leaders to ask whether German legislators have any interest in a domestic renewable energy industry. Over the past two years, Germany has experienced an 80% decline in new turbine investment. While there are a number of reasons for collapsing investment, many of them can be remedied over the short term. There has also been a marked decline in investment in reserve power plants fired with natural gas, despite the fact that such plants will be sorely needed over the next decade as Germany phases out nuclear and coal. And while investment in PV systems recovered somewhat in 2019 following an extended period of weakness, the corona crisis in combination with the current 52 GW expansion cap threatens to stifle investment once again.

In contrast to other branches of the economy, the renewable energy sector is already well positioned to make a quick return to growth once the coronavirus pandemic abates and supply chains are restored. For this reason, the renewable energy sector requires

relatively little financial support from federal government to weather the crisis. Indeed, a robust instrument for directing investment in existing and new energy systems is already in place in the form of the Renewable Energy Act (EEG). Accordingly, the essential issue at hand is not to channel additional resources to the sector, but rather to eliminate existing hurdles to growth.

Adjustments to the EEG have put the brakes on renewable energy growth. Indeed, the limitations that were added are currently preventing investment and an associated creation of jobs. To ensure a robust recovery of the sector following the crisis, legislators need to remove their foot from the brakes. An elimination of regulatory hurdles to faster renewable energy growth is long overdue, making it all the more pressing. Merely stepping off the brakes will unleash a powerful stimulus for growth. As an additional form of stimulus, we recommend measures to accelerate PV and wind energy expansion. These measures, which would trigger investment worth 10 billion euros by 2030, would not require additional federal spending, however, as they would be financed via the EEG levy. Their effect on increasing the EEG levy, which is paid by electricity customers, would be minimal, as the cost of new wind and PV systems is close to the wholesale electricity price. Depending on how carbon certificate prices develop over the coming twenty years, these additional investments would only lead the EEG levy to increase by a few tenths of a cent – or potentially not at all. The three billion euros in spending required from the federal budget is earmarked for investment in smart power grids.

The short-term measures implemented as part of the coronavirus pandemic should thus be designed to

help lift the energy economy out of its current difficulties. The onshore wind and PV industries are particularly in need of targeted assistance. A strong boost in investment in these industries would augment the volume of cheap renewable electricity being fed into power grids – a necessary precondition for preserving the competitiveness of the German chemical and steel sectors during the transition to a zero-carbon economy. An investment boom of this nature would also directly benefit the mechanical, plant and electrotechnic engineering sectors, which play a particularly prominent role in the German economy. Last but not least, numerous provisions of the Renewable Energy Act are in need of fundamental reform, although this issue is tangential to current stimulus measures.

7.1 Strengthen the solar industry; accelerate capacity expansion

Some ten-thousand contractors in Germany offer services in the solar sector. For the clean-energy transition to be a success, current PV capacity (approx. 200 GW) will need to quadruple by 2050. In order to protect this branch during the coronavirus crisis, the following support measures should be enacted:

→ Immediate elimination of the 52 GW solar cap.

In the absence of this measure, a veritable moratorium on PV investment could occur in the summer of 2020, at the height of the economic crisis. At the same time, the PV expansion target in the Renewable Energy Act should be increased from 2.5 to 10 GW per year.¹⁶

→ Special auctions for the installation of ground-mounted PV arrays at a rate of 5 GW per year in 2021 and 2022. To enable this PV expansion, the federal government should considerably expand the areas where PV can be installed as well as increase

the output limit on ground-mounted arrays from 10 to 25 MW. Former coal mining sites represent a promising location of solar array installation given the necessary regulatory adjustments, not least because power grid access is directly available.

→ **Eliminate barriers to PV generation and storage systems:** When self-generated PV electricity is consumed on-site, the operator is not required to pay the EEG levy – unless the system is larger than 10 KW. This rule significantly discourages the construction of larger systems, particularly by companies, and it also creates unnecessary bureaucracy. The elimination of the 10 KW threshold for the applicability of the EEG levy would quickly enable a large volume of investment. In particular, it would incentivise the construction of dual PV generation and storage systems.

7.2 Reinvigorate the wind power industry; eliminate barriers

2019 was already a year of crisis for the wind power industry, with jobs being shed in large numbers at German turbine manufacturers such as Enercon and Vestas. The installation of turbines in Germany has been impaired in recent years by permitting limitations as well as a dearth of available sites. And now, the coronavirus crisis threatens to deal irreparable damage to the ailing German wind power industry – despite its importance for further progress in the clean-energy transition. It would be irresponsible to watch idly as the German wind power industry collapses under the conviction that imports from abroad can meet future needs. An additional risk is that total installed capacity in Germany could decline in the coming years, considering that the guaranteed feed-in tariff eligibility for older turbines equivalent to some 12 gigawatts will expire between 2021 and 2030. At the beginning of 2021 turbines with an output of four gigawatts will lose their feed-in tariff eligibility. Given current wholesale electricity prices, the continued operation of these turbines is uncertain, and significant follow-up investment is

16 See Agora Energiewende and Wattsight (2020): *Die Ökostromlücke, ihre Strommarkteffekte und wie sie gestopft werden kann.*

required. Furthermore, permitting law currently forbids the erection of new turbines at existing wind production sites. As a result, a massive decline in wind energy production is looming on the horizon.

However, the wind power industry is an important economic branch in Germany, providing a large number of jobs across the country. On account of the increased demand for wind turbines that can be expected as part of the EU Green Deal, it is essential to increase production capacities in this area. The following immediate action measures are therefore necessary, and should be passed by legislators before the end of summer 2020:

- **Revise the permitting law framework for onshore wind turbines in order to accelerate capacity expansion while also providing legal certainty:** The new framework should seek to strike a viable balance between uniform national rules, freedom of action for cities and regions, as well as the right of local residents to have their voices heard.
- **Short- and medium-term measures to resolve the conflict between onshore wind energy expansion and wildlife protection.** Policy should be guided by the insight that while climate protection ultimately serves wildlife protection, the former should not endanger the latter over the short term.
- **Reduce the protective radius of VOR beacons from 15 to 10 kilometres** – thus aligning German regulations with international standards – and replace old CVOR with new DVOR systems. This change would directly trigger 2 billion euros in investment for the construction of an additional 1.5 GW of wind turbines before the end of 2020.
- **Exempt smaller wind parks from auction requirements** in accordance with option foreseen by EU state aid rules for renewable energy. The rate of remuneration should be set to reflect the average auction result achieved in the year prior. Small operators should also be given a loan by the KfW development bank in order to finance permit-related costs. This loan would only become due if permit approval is granted and the project is fully realised.

- Grants should be allocated to **extend the lifespan of wind turbines** that lose guaranteed feed-in eligibility from 2021 onward and which would otherwise be dismantled. Grants to defray investment costs should be provided when significant investments are made that extend the turbine lifespan to 30 years.
- **Repower existing turbines with new turbines that have a comparable nacelle height:** Numerous turbines that lose their guaranteed feed-in eligibility and whose lifespans cannot be extended were originally constructed in the 1990s and early 2000s. These turbines are usually much smaller than their contemporary counterparts, and they are often located near inhabited areas. Permitting law should be modified to allow the replacement of these turbines with modern equipment, provided the existing nacelle height is not exceeded. Due to the lower generation output of these turbines in comparison with the newest models, they should also receive a guaranteed supplement to the feed-in remuneration level that was determined by auction. This rule should only apply to turbines that initially went into operation prior to the end of 2005.

Assuring sufficient space for wind turbine construction is another essential issue. The proposed introduction of a nationwide minimum distance between wind parks and inhabited areas would have an extremely negative impact on investment, as a fixed distance would dramatically reduce the area available for turbine construction. Instead, policymakers should collaborate at the federal and state levels to adopt a clear expansion target for wind energy (including how much capacity should be built and when). Furthermore, clearer rules should help guide location selection while providing legal certainty. The federal government should seek to define in each state appropriate land areas that have preferential status for wind turbine construction, without losing sight of location conditions (wind levels, topography, population density, etc.). We call on the federal government and Energy Ministers Conference to make a recommendation in this regard by the end of 2020.

7.3 Ensure reliable investment conditions for the offshore wind industry

The North and Baltic Seas are particularly suitable for the construction of offshore wind turbines due to windy site conditions. In coming years, however, offshore wind capacity expansion will be limited, as spatial planning for the 2030 target is just now taking place. In order to ensure that Germany maintains rather than reduces its production capacities in offshore wind, the **2030 offshore wind target should be increased this year to at least 25 GW.** (The current target in Renewable Energy Act is 20 GW.) The actual installation of these capacities would then take place starting in 2023. In order to enable installation to take place in due time, the Federal Maritime and Hydro-graphic Agency (BDH) should rapidly expand its personnel resources devoted to permit application review and issuance. In addition, the auction system needs to be redesigned, as it only permits zero-cent bids at present. Given current wholesale electricity rates as well as low fuel prices, the system should be reformed, potentially based on the contract for difference (CFD) model.

7.4 Smart power grid investment (3 billion euros)

The power grid is a key pillar of the carbon-neutral economy, in part because of the central role played by power grid infrastructure as energy sectors become increasingly integrated. In the future, all aspects of the economy will depend on the reliable and inexpensive availability of carbon-neutral electricity, as energy systems in the transport, industry, and building sectors are being increasingly electrified. The demands placed on the power grid, particularly on local low-voltage grids, will increase immensely as the number of flexible consumers and prosumers grows. The power grid infrastructure of the last century is not up to the task of supporting a carbon-neutral economy and could significantly impair

the adoption of electric vehicles, heat pumps and electricity-powered process heat solutions.

We advocate a **targeted investment programme for power grids** in order to rapidly expand grid capacities. This programme should accelerate the installation of high-temperature power cables, temperature monitoring equipment, and grid boosters and buffers at the transmission grid level while also promoting the deployment of smart transformer equipment in local distribution grids to accommodate new consumers and small-scale suppliers. Local distribution grid operators should be encouraged to rapidly upgrade substation infrastructure if clearly defined grants were made available. We also advocate the introduction of an immediate-action programme for transmission grids to accelerate the already planned upgrading of the grid with temperature monitoring equipment and high-temperature power cables. As an additional measure, transmission grids should be rapidly equipped with grid boosters and buffers. The goal is to augment the amount of electricity that can be transported in existing grids. The federal government should make some 3 billion euros available up to the end of 2025 to support the improvements. These measures will help to protect jobs in the metalworking and electronics industries – key branches of the German economy, supporting over 4 million jobs. In addition, they will have numerous positive knock-on effects, as they will furnish as a basis for new business models and climate-friendly investment. As an additional benefit, they will reduce future grid expansion requirements. In this way, they represent a particularly forward-thinking form of stimulus.

We recommend to fund these measures with money from the federal budget, rather than from increased grid usage fees. The electricity grid fee directive (StromNEV) should be revised to clearly stipulate that capital expenditures associated with these investments are not to be included in the calculation of grid usage fees.

8 Accelerate planning and improve training

To ensure that the economic stimulus package is effective, it is necessary not only to allocate funding for investment, but also to consider the environment in which investment will be made. Clearly, when individual elements are added together – including increased public investment, incentives for private-sector investment, improved regulatory conditions, and spending on training measures – the total will be larger than the sum of its parts. By way of example, the market uptake of electric vehicles will be enabled if four measures are combined: electric vehicle rebates (to promote consumer purchase), e-charging infrastructure (public investment), clear standards (uniform charging system) and training measures (retraining of employees to support electric vehicle production).

However, many occupational categories lack qualified workers. Furthermore, planning and approval processes in Germany require too much time. Accordingly, beyond merely increasing public and private investment, there is a need to ameliorate the shortage of skilled workers while also accelerating the bureaucracy required to conduct investment.

8.1 Vocational qualification and retraining for future technologies

A **vocational retraining offensive** should be launched to provide existing workers (e.g. in construction and manufacturing) with new technological expertise. The training programmes could be developed with government funding while harnessing latent manpower in the industrial and educational sectors. Once developed, the programmes could be administered using modern telecommunications solutions. A retraining offensive of this nature would allow companies to outfit their employees with the skills required to drive an economic upturn that is both economically and ecologically sustainable. It would

also allow these companies to take a more active role in shaping necessary structural change. A comprehensive retraining offensive will not be possible through reliance on the activities of individual companies, however. The offensive should be guided by the government and initiated in close partnership with the private sector. Federal and state governments should collaborate in the funding of the retraining offensive, and should work to develop regional transformation plans, open source hubs, and/or training centres.

8.2 Accelerate planning and approval processes

An economic stimulus programme can only be considered effective if the investment spending that is encouraged can actually be implemented over the near term. At the same time, Germany is known as a country in which the realization of important infrastructure or technological investment can sometimes take years or even decades – even during normal times – due to regulatory requirements, public opposition, protracted legal battles and/or insufficiently staffed bureaucratic authorities. Yet a lack of clear and reliable standards can also impair investment. However, factors that merely impede the dynamism of the economy during normal times may acquire special severity during the coronavirus crisis insofar as they sabotage reform measures that are designed to make the economy and society more resistant to additional external shocks.

In light of these facts, Germany is in need of a stimulus and reform package that catalyses the construction of modern infrastructure, promotes the development of future technologies, and establishes regulatory conditions that are tailored to the needs of the clean-energy transition. Beyond only allocating funding, a focus needs to be placed on removing

existing barriers to investment. In this way, energy policy and associated regulation needs to become more results oriented, yet without losing sight of important legal standards or the protection of people and the environment. The right of citizens to play a role in the formulation of government policy should be preserved, despite the problems encountered in recent years with local resistance to energy infrastructure and investment projects. Indeed, the problem is not citizen participation per se, but rather the deliberate abuse of participatory forums by parochial interests seeking to block and delay, rather than make a constructive contribution.

Gathering consensus on such issues is not only the task of policymakers, but must be viewed as a process of negotiation within society as a whole. Accordingly, we recommend that the federal government form a **special commission to dismantle barriers to investment and design regulation oriented to the needs of the European Green Deal**. This commission should be composed of representatives from key stakeholder groups, based on the model set forth by the commission that hammered out the terms of Germany's coal phase-out. This commission should work to develop a consensus concerning how to improve the conditions for private-sector investment in the infrastructure and technologies of the future, including smart power grids, renewable energy systems, and electric vehicle charging networks. As part of this work, the commission should identify regulatory factors that are impeding the clean-energy transition and impairing government support for investment in innovation and climate protection. The commission should be convened prior to the legislative break this summer, and should seek to present its findings this autumn, so that they can be successively implemented thereafter.

8.3 Enhance personnel capacity at planning and permitting authorities

Lack of personnel at government planning and permitting authorities already acts as an impediment to public- and private-sector investment. Personnel resources need to be strengthened in a targeted fashion at the municipal, state and federal levels to accelerate public-sector investment projects as well as enhance the efficacy of investment incentives for the private sector. In the absence of improvements in this area, disbursement bottlenecks – a key problem that has plagued stimulus spending in the past – could occur again.

In light of the dire economic risks posed by the coronavirus pandemic, federal and state governments should undertake unconventional measures and fully leverage legal opportunities at the federal level to support the necessary personnel expansion. Similar to the funding already provided for climate protection managers, the federal government should allocate targeted human resources funding so that government planning and permitting authorities are better equipped to implement the European Green Deal. To this end, the federal government should partner with the states to create a fund that provides the financial resources needed to pay for the new positions for a period of at least five years.

9 Tackle the crisis together with European partners (German contribution: 20 billion euros)¹⁷

National borders offer little protection against the coronavirus or its economic effects. All of Europe, particularly the Italian and Spanish economies, is teetering on the brink of a severe economic crisis that could critically undermine the common currency and the European Union as a whole. The coronavirus crisis is thus a decisive test for the unity of the European Union. Accordingly, the mechanisms available at the European level should be harnessed in the spirit of solidarity to facilitate the economic recovery of regions particularly hard hit by the crisis. Vigorous action to shore up our neighbours is not only advisable from the standpoint of pan-European solidarity, it also has practical benefits for Germany. Further, robust action on the part of the European Union is needed on a global level, not least because of the increased isolationism of the United States under President Trump.

Since the outbreak of the pandemic, European institutions have strived to implement a coordinated response. The ECB, for example, announced the €750 billion Pandemic Emergency Purchase Programme and the EU Commission proposed a €37 billion Coronavirus Response Investment Initiative. In addition, the EU Commission loosened state aid rules on a temporary basis until 31 December 2020 to provide member states with greater freedom of action. Moreover, the European Investment Bank is providing short-term financing assistance worth €40 billion in order to help SMEs overcome liquidity and resource bottlenecks.

EU institutions will also play an important role in the economic recovery. National governments and the EU Commission have access to a large toolbox of policy options. (See the infobox below.) Thus, there are grounds for hope that Europe as a whole will emerge stronger from the crisis, despite the initial difficulties encountered in developing a concerted policy response.

EU leaders and the European Commission have expressed political agreement that European and national recovery plans should reflect the goals of the European Green Deal. The coronavirus pandemic has not changed the long-term vision or strategic orientation of the European Green Deal. However, elements of the European Green Deal that are particularly suitable for stimulating the economy should be implemented on an accelerated timetable. Indeed, if the investment resources of tomorrow are being allocated today to mitigate the economic effects of the pandemic, then the investment decisions of tomorrow should also be taken ahead of schedule.

While the specific contribution of Germany to the proposed EU recovery fund is under discussion among the European partners, the German government should ensure that the following priority measures are included in activities supported by this fund:

¹⁷ This paper was published in German prior to the EU Commission proposal for an EU Recovery Fund on 27 May 2020 and before President Macron and Chancellor Merkel presented related ideas. Our suggestion for a German contribution of 20 billion EUR is outdated now. This said, the substantive priorities highlighted in the EU section still stand and require adequate support.

Options at the EU level for economic recovery

The European Central Bank (ECB). The ECB is the monetary authority for the 19 EU states that use the euro as their official currency. To be sure, the ECB's monetary policy is an important factor for the recovery of eurozone nations. The ECB is engaged in various measures to shore up the stability of eurozone countries, including a large-scale asset purchase programme. This purchase of sovereign debt on secondary markets indirectly supports the budgets of eurozone states.

The European Investment Bank (EIB). Similar to KfW in Germany, the EIB is the EU's development bank. The EIB is capitalized by the 27 member states of the EU. As the largest capital contributors, Germany, France and Italy have the largest influence over the EIB's lending strategy. Member states and the EU Commission have declared they wish to make the EIB the EU's 'climate bank'. The EIB had an equity capital endowment of more than 240 billion euros in 2020, and it financed investments worth some 63 billion euros in 2019.

The EU Budget. The European Union's budget for 2019 was 148 billion euros, which was equivalent to 2% of the combined budgets of the member states. Despite its relatively small size, EU spending plays an extremely important role in poorer member states, particularly in the co-financing of infrastructure investment in Eastern and South-eastern Europe.

State aid rules. Many stimulus measures at the national level are considered state aid under EU law. The EU Commission monitors state aid spending in order to minimize distortions to market competition. According to EU law, state aid is prohibited without the prior assent of the EU Commission.

Projects of Common European Interest. According to EU law, state aid is compatible with the internal market when an important project of common European interest is financed. Stimulus measures that further European Green Deal should fall under this provision of EU law.

The European Semester. EU countries coordinate their economic and fiscal policies on an annual basis as part of the European Semester. Measures to support economic recovery will be an important focus of future coordination. The EU Commission has announced it will take the unique importance of climate protection measures into account when assessing national spending plans.¹⁸

National Energy and Climate Plans (NECPs). Almost all member states have developed climate protection and energy plans that explain the concrete measures they have taken or plan in order to achieve the 2030 targets for climate protection, energy efficiency and the expansion of renewables. These plans indicate investments slated for coming years that can now be expedited in the interest of stimulating economic recovery.

18 See European Green Deal, COM (2019) 640 final of 11.12.2019.

9.1 Create a European green hydrogen economy and massively expand renewables

Europe must greatly expand renewable energy production if it hopes to become climate neutral. At the end of 2019, total installed renewables capacity in Europe stood at 130 GW for solar, 170 GW for onshore wind and 20 GW for offshore wind. According to scenarios developed by the European Commission, climate neutrality by 2050 will require a five- to eight-fold increase in solar and onshore wind, in addition to a 20-fold increase in offshore wind.¹⁹ The scope of renewables expansion will necessarily vary by region. Areas of Northern and Southern Europe that are particularly rich in wind and solar resources can produce more energy than needed locally. Many of Germany's European neighbours also have an outsized production potential in relation to their domestic consumption. In Europe's industrial core, however, the exact opposite is true: demand significantly outstrips local supply.

In the power sector, this spatial divergence between renewables production and consumption can only be overcome by constructing additional long-distance transmission lines and cross-border grid interconnections. Renewable hydrogen is another form of energy that must be transported to areas of high demand. Regional hydrogen grids will need to be supplanted over the mid-term by transnational European hydrogen storage and transportation infrastructure. Work on planning this infrastructure should begin immediately. Ideally, existing natural gas lines should be converted to carry hydrogen. However, the installation of new hydrogen pipelines will primarily be needed in Southern Europe (for example, to connect Italy to North Africa and later to the Middle East).²⁰

19 European Commission (2018) A Clean Planet for All, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0773>

20 Dii Desert Energy (2019): <https://dii-desertenergy.org/wp-content/uploads/2019/12/Dii-hydrogen-study-November-2019.pdf>

We recommend focusing on the following measures:

→ **Offshore wind power in the North and Baltic Seas:**

The renewable energy generated by offshore wind parks in the North and Baltic Seas will play an important role in the accelerated expansion of renewables in Europe and will also be crucial for the production of green hydrogen. According to the latest estimates of the EU Commission, the yearly offshore expansion rate needs to be rapidly expanded, from 3 GW to at least 7 GW. On average, 15 GW of new wind capacity will need to be constructed every year up to 2050. In addition, it is essential for the countries bordering these two seas to coordinate the development of their offshore wind farms and to make joint investment in an integrated power grid.

→ **A solar south:** Southern Europe is far from fully tapping its potential for the development of solar energy. As investment costs for solar energy have fallen considerably, a new PV installation wave is possible. Countries especially impacted by the coronavirus pandemic, such as Spain and Italy, would stand to benefit from a new PV development offensive.

→ **Using the EU's financing mechanism for renewable energy:** The 2018 Clean Energy for All Europeans package created an EU financing mechanism for renewable energy. This mechanism is to be activated if renewables development at the national level falls short of what is necessary to meet EU targets. The EU Commission and member states should resolve to disburse EU funding through this financing mechanism in order to bolster clean-energy support mechanisms in countries particularly hard hit by the crisis.

→ **A favourable regulatory environment for the rebirth of the European solar industry:** Given low energy costs and a high degree of production automation, PV panels can be manufactured in Europe at a price that is competitive with their Asian counterparts. Europe should take advantage of its many decades of research in solar energy by producing a share of the solar products it consumes

each year within Europe. This would be an advisable course given that some 40 GW of PV will need to be installed across Europe each year. Furthermore, there is a growing need for application-specific solutions, such as panels better-suited for rooftop systems. These factors speak in favour of an effort to rekindle the European solar industry.

→ **Clean hydrogen:** In the recently released European Industrial Strategy, the EU Commission announced the founding of a European Clean Hydrogen Alliance. This initiative should be expedited while targeting a European-wide green hydrogen market share of 10% by 2030. To achieve this goal, the initiative will provide for the planning and financing of complementary investment in necessary infrastructure (e.g. electrolysis plants; gas grid improvements; hydrogen infrastructure; carbon capture and storage).

9.2 Declare important initiatives under the European Green Deal as “projects of common European interest”

Significant advantages arise when large-scale projects in the area of climate protection and decarbonisation are undertaken in collaboration between several member states. Qualification as an Important Project of Common European Interest (IPCEI) brings a significant relaxation of state aid rules as well as privileged access to European sources of funding. Many IPCEI projects involve the effort to establish common standards, and they are undertaken in alliances between industry, public-sector banks, the EU Commission and member states. EU Commission should streamline the formal process for IPCEI approval to facilitate the rise of a European clean hydrogen industry, advance the already existing Battery Alliance, and aid the development of the following key projects:

→ **Prioritize energy efficient retrofitting of the building stock**

The building sector accounts for some 40% of the energy consumed in Europe. Furthermore, some three-quarters of the building stock was constructed prior to adoption of efficiency standards. We must triple the retrofit rate to achieve carbon neutrality over the long term. Energy efficient retrofitting creates jobs locally while strengthening small and mid-sized companies. It can also be targeted to improve the living standards of disadvantaged households. Accordingly, a key focus should be placed on realising the “renovation wave” outlined by the European Commission. The energy efficient refurbishment of hospitals, schools, kindergartens and public housing should receive first priority. Valuable measures that could help to trigger a large-scale renovation wave – and, by extension, bolster the economy – include: clear milestones (e.g. refurbishment of all schools and hospitals by 2030); a training initiative; the simplification and acceleration of the permitting process; unbureaucratic financing instruments; and simplified state-aid rules for national efficiency programmes.

→ **Support the rise of green steel:**

Clear regulatory conditions are needed to enable investment in a European green steel industry. To ensure that the EU’s carbon abatement targets for 2030 can be reached while supporting the modernisation of the steel industry’s asset base, policymakers should adopt the goal of producing 35 million tonnes of steel using low- or zero-carbon methods by 2030.

→ **EU electric vehicle fast charging initiative:**

To enable the broad use of electric vehicles, Europe needs a comprehensive network of charging stations, including a large number of fast charging stations. While fast charging infrastructure is being installed at a rapid pace along busy transnational arteries in Europe’s core, there is a marked lack of such stations for trucks and cars away from the busiest highways. Policymakers should implement auctions that set forth clear time frames

and geographic specifications to support the adoption of fast charging infrastructure across Europe. This would considerably augment demand for battery-electric vehicles.

→ **A favourable regulatory environment for the rebirth of the European solar industry:**

Given low energy costs and a high degree of production automation, PV panels can be manufactured in Europe at a price that is competitive with their Asian counterparts. Europe should take advantage of its many decades of research in solar energy by producing a share of the solar products it consumes each year within Europe. This would be an advisable course given that some 30 GW of PV will need to be installed across Europe each year. Furthermore, there is a growing need for application-specific solutions, such as panels better-suited for rooftop systems. These factors speak in favour of an effort to rekindle the European solar industry.

9.3 Clear guidelines for stimulus programmes and other supportive measures

Even if the EU devotes greater funding to stimulus measures, in most countries, national economic recovery programmes will be considerably larger in scope than EU programmes. Accordingly, the EU Commission should establish guidelines indicating which types of stimulus measures help to further the Green Deal while also highlighting measures that impede the EU's ambition of achieving a 50 to 55 percent reduction in emissions by 2030 and complete carbon neutrality by 2050. In addition, the EU Commission should deliberate with member-state governments to identify which aspects of national climate protection and energy plans are particularly appropriate for accelerated implementation. In this connection, the EU Commission should seek to determine the concrete technical, administrative and/or financial support that can be provided by the Directorate-General for Structural Reform Support.

9.4 Augment the power of the European Investment Bank (EIB) with green bonds

The European Green Deal is an investment programme of momentous size. It seeks to trigger economic growth and create jobs in cutting-edge industries while furthering the goal of climate protection and, by extension, laying a foundation for a stronger European Union. According to estimates produced by the EU Commission, the European Green Deal will require €260 billion in additional investment each year over the next ten years. The EU Commission intends to facilitate a significant portion of this spending through the European Investment Bank (EIB).

In view of the magnitude of spending required to confront the crisis and decarbonize Europe's economies, there is a pressing need to expand the capitalization of the European Investment Bank (EIB). One solution is to allow the ECB to purchase bonds issued by the European Investment Bank to increase funding available for the European Green Deal. The ECB has already undertaken such purchases to a limited extent, and, according to the European Court of Justice, the purchase of such fixed-interest securities on the secondary market is compatible with the ECB's mandate. To date, the volume of bonds emitted by the EIB is relatively small; over the past ten years, it issued green bonds with a nominal value of just 18 billion euros.

What is more, the EU Commission and EU member states aim to turn the EIB into a "European Bank for Climate Protection", which primarily invests in projects that advance the transition to clean energy. Accordingly, it is the will of the member states that the EIB focus predominantly on investments related to energy efficiency, renewables and energy infrastructure. At the end of 2020, the EIB will no longer finance energy projects based on fossil fuels. A stronger role for the EIB also appears to be politically viable, as member state representatives on the EIB's supervisory

board would be able to monitor the volume of EIB bond issuance while also determining the political priorities pursued with this additional capital.

9.5 Align the EU Recovery Fund and EU's 2021–2027 budget to the long-term goal of carbon neutrality

Negotiations on the EU's 2021–2027 budget, which began in 2018, reached an impasse before the outbreak of the coronavirus pandemic. In particular, the issue of how to fill the hole in the budget caused by the departure of the UK unleashed considerable disagreement between member states. The financing framework established by the EU budget is especially important for southern and eastern European states since public infrastructure projects in these regions invariably depend heavily on the EU regional development fund.

As a political compromise to the controversial debate surrounding corona bonds, European leaders tasked the EU Commission with developing recommendations for an EU Recovery Fund that is to be part of the 2021–2027 budget.²¹ In total, European funding of up to two trillion euros could be made available for economic recovery and the reorientation of the economy towards carbon neutrality.

The German government already emphasized that Germany will have to significantly augment its contribution to EU budget, but that this is clearly in Germany's own interest. Indeed, the economic recovery of Germany's European neighbours is essential; some 60 percent of German exports flow to

other EU countries. The recovery fund would constitute a practical demonstration of European solidarity during the crisis while bolstering Europe's political unity, which has suffered in recent weeks. However, against the backdrop of the European Green Deal and the need for effective climate protection, Germany should clearly state that its increased budget contribution is tied to the condition that stimulus spending serve as the transition to carbon neutrality. For example, Germany could support using half of the recovery funding for investment spending related to climate protection while prioritising investment in renewables, energy efficient retrofitting, sustainable transport and innovative technology (such as clean hydrogen).

21 See <https://www.consilium.europa.eu/en/press/press-releases/2020/04/23/conclusions-by-president-charles-michel-following-the-video-conference-with-members-of-the-european-council-on-23-april-2020/>

10 Conclusion: Pro-active policy measures are needed to confront multiple crises

The coronavirus pandemic has necessitated quick government action. However, the crisis is not yet over, and dealing with the economic fallout will be a major challenge. Moreover, the coronavirus crisis does not mitigate the significance of other challenges in industrial policy such as global warming and digitalization. Rather, it represents a cumulative addition.

Unique times require unique measures. We suggest that the multiple crises confronting Europe be considered in unison, and that a comprehensive solution for them should be sought. This manner of thinking leads to a common principle that the economic stimulus is necessary to lift Germany and Europe out of the greatest economic crisis since the end of the Second World War. Specifically, the stimulus should be undertaken under the umbrella of the European Green Deal. The stimulus programme that we have outlined would generate dual benefits for the German economy, for it would ameliorate the economic effects of the coronavirus pandemic while providing industry with an impetus to modernize its productive capacities. For the success of this second, transformative goal, short-term stimulus measures will need to be followed by a phase of reform in which lasting changes are made to economic structures and their associated market and regulatory conditions. A transformation of this nature stands to benefit all of us, including the private sector. Without it, the next economic crisis is sure to strike within a few years as climate change intensifies.

Other challenges, such as those related to digitalization and healthcare infrastructure, were not specifically addressed in this paper due to lack of expertise on the part of the authors. However, these areas should also be given due consideration as the government develops a stimulus programme.

The ultimate aim is to design a package of measures which – following an initial focus on stabilising the economy – helps to bring Germany Europe and on a growth path that leads to a sustainable future.

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