

Policy instruments for a climate-neutral Germany

50 recommendations for the 20th legislative period (2021–2025)

IMPULSE



Introduction: The global race has begun

Dear reader,

Man-made climate change is a threat to humanity and nature. Despite all the progress, our national economies are still largely based on oil, coal and natural gas. A rapid and decisive switch towards climate neutrality is urgently required. Otherwise, the commitments and goals of the Paris Agreement – limitation of global warming to significantly less than 2 degrees and preferably 1.5 degrees compared to the pre-industrial level – cannot be achieved.

Climate change mitigation requires global action. The three large economic areas of the world, China, the USA and Europe have agreed a goal of climate neutrality by the middle of the century. We are at the start of an international competition for the best strategy: something that will also determine success on the markets of the future.

Germany has a particular responsibility for this, as the largest member state within the EU and its largest producer by far of greenhouse gases (GHG). Europe can only be successful in mitigating climate change if Germany is.

In this paper the Stiftung Klimaneutralität, Agora Energiewende and Agora Verkehrswende wish to put forward recommendations for a targeted climate change mitigation policy in the legislative period 2021–2025.

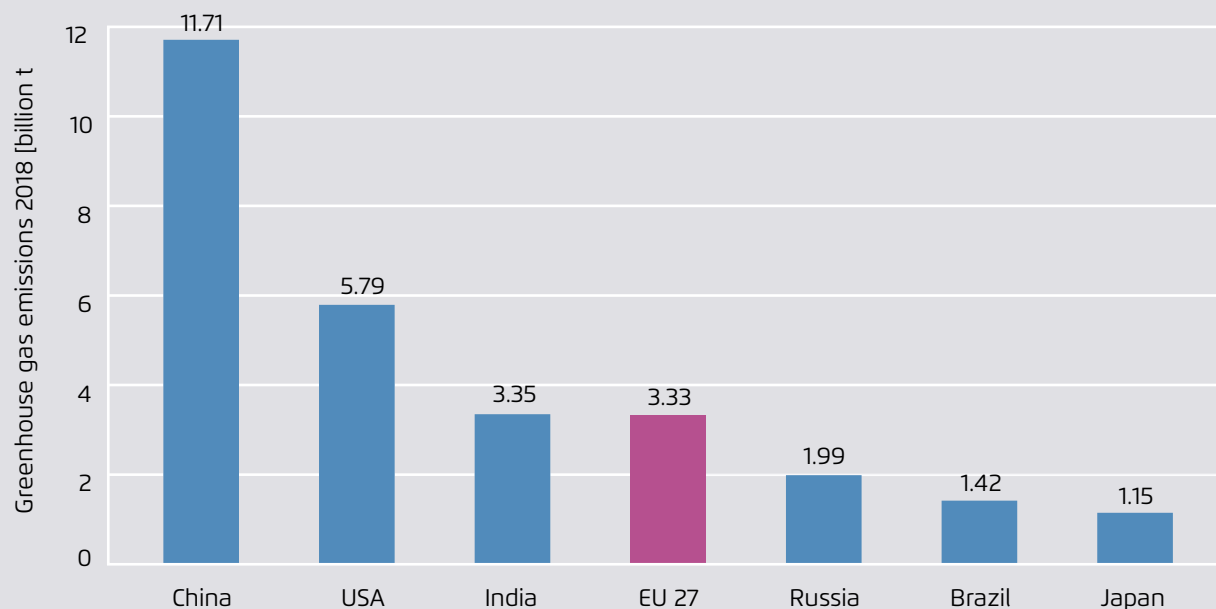
We wish you a pleasant reading!

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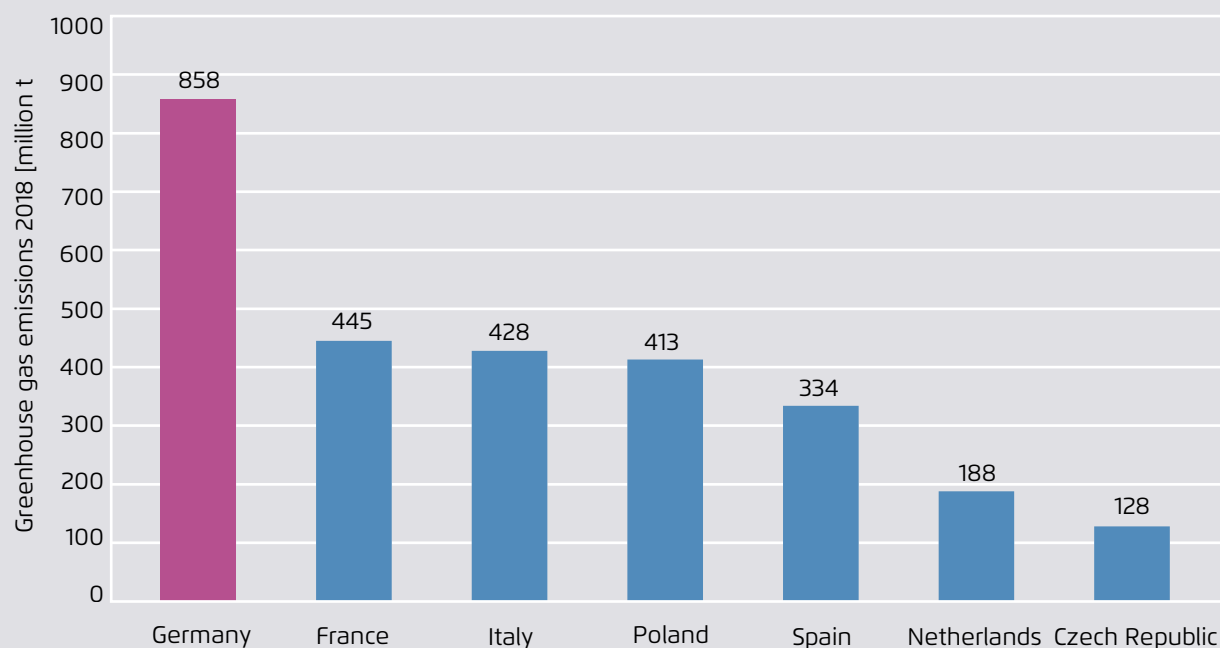
Christian Hochfeld
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Figure 1: The seven largest emitters of greenhouse gases worldwide (2018, in billion t CO₂eq)



Climate Watch 2021

Figure 2: The seven largest emitters of greenhouse gases in the EU (2018, in million t CO₂eq)



EEA 2021

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1 Long-term strategy with targets and interim targets

Germany wants to become climate neutral by 2045 and, in an intermediate step, to reduce its greenhouse gas emissions by 2030 to at least 65 per cent below the 1990 level. The German Federal Government decided this course of action from the April 2021 ruling of the Federal Constitutional Court on the Climate Change Act (Klimaschutzgesetz); the necessary amendment to the Climate Change Act will be passed by the Federal Government in summer 2021.

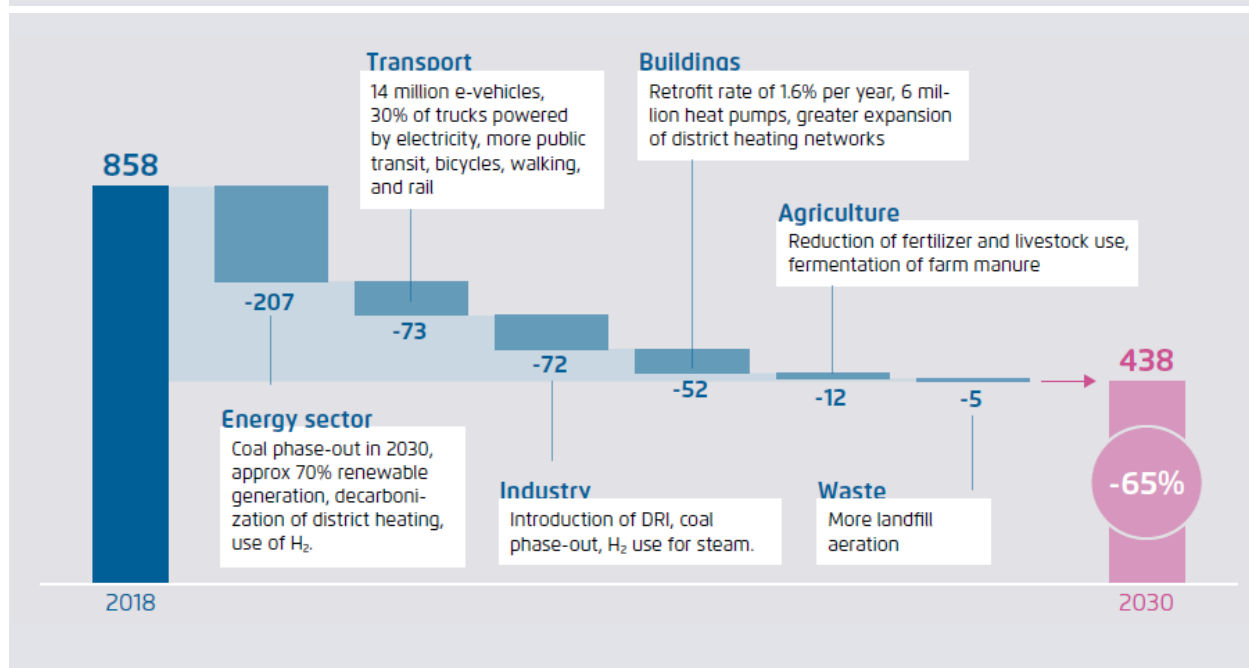
The new German 2030 climate goal also matches the German contribution to the new EU climate mitigation goal for 2030, which aims to reduce greenhouse gas emissions in Europe by 55 percent below the 1990 level.

Over the last few months we commissioned Prognos, the Öko-Institut and the Wuppertal Institut to develop two scenarios for practical routes to a climate-neutral Germany – with core criteria of cost effectiveness, safeguarding investment cycles and acceptance. The second study, published on 26 April 2021, describes the exact route that the Climate Change Act now indicates: minus 65 per cent greenhouse gases by 2030, climate neutrality by 2045.

These higher goals can be implemented but they require a completely new character and a significantly greater tempo in climate policy. Our study *Towards a Climate-Neutral Germany 2045* demonstrates an

internally consistent scenario and describes the technological pathways that need to be followed in order to reach the targets in the different sectors.

Figure 3: Measures to reduce greenhouse gases by 65 per cent by 2030
(greenhouse gas emissions in million t CO_{2eq})



Prognos, Öko-Institut, Wuppertal Institut (2021): Towards a Climate-Neutral Germany by 2045

Note: H₂= hydrogen; RE = renewable energy; 65% reduction in greenhouse gases compared to 1990

In this report we take things a stage further and present practical proposals for the instruments that need to be agreed in the next legislative period in order to attain the upgraded interim goal for 2030.

One thing is clear: even if the EU Commission presents a comprehensive legislative package under the title "Fit for 55" in July 2021, this cannot be a replacement for decisive action by the next German Federal Government. European measures are necessary for reaching the goals but are not sufficient – many environmental policy competencies now lie at national level.

Our approach is based on a mixture of instruments: by means of CO₂ pricing, regulatory law, funding measures and tax incentives, an innovative and at the same time socially fair transformation of the German economy towards climate neutrality can succeed.

Some of the proposals appear radical and there are of course alternatives. Those who wish to make some instruments less stringent will need to propose correspondingly stronger measures in other places. For, since the ruling of the Federal Constitutional Court, there is one option no longer available: leaving the necessary reduction in emissions to the next generation. Climate change mitigation is the task of our generation – and the next legislative period will largely decide success or failure in reaching the 2030 climate targets.

Table 1: Overview of sectoral measures and reduction targets by 2030
(greenhouse gas emissions in million t CO_{2eq})

Sector/Measures	Emissions 2019	Required reduction 2019–2030*	Sectoral target 2030*	Sectoral target 2030 according to the amendment to the Federal Climate Change Act (2021)**
Energy sector → National carbon floor price in the ETS → Expansion of RE electricity generation to 70% → Green district heating increases by 50% → Hydrogen in electricity and district heating	258	160	98	108
Industry → Introduction of direct reduction for steel manufacture → End of coal utilization → Hydrogen in steam generation	187	64	123	118
Transport → 14 million electric cars → 30% of road freight kilometers electric → More public transport, cycling and rail	164	75	89	85
Buildings → Renovation rate 1.6% → 6 million heat pumps → Greater expansion of heat networks	123	58	65	67
Agriculture → Reduction of animal stocks → Reduction of fertilizers → Fermentation of farm manure	68	10	58	56
Other	9	4	5	4
Total	810	372	438	438
Reduction compared to 1990	-35		-65	-65%

* according to Prognos, Öko-Institut, Wuppertal Institut (2021): Towards a Climate-Neutral Germany by 2045

** according to the German Federal Government cabinet decision of 12.05.2021

2 Policy proposals

Cross-Cutting

1 Make Climate the Federal Change Act more effective

If the sectoral targets fail to be met, an automatic adjustment mechanism will be introduced to the Federal Climate Change Act (raising the CO₂ price or a measure with comparable effect) in order to avoid shifting attainment of the climate goals onto later generations, in line with the ruling of the Federal Constitutional Court. For public authorities a CO₂ shadow price at the level of the CO₂ damage costs of EUR 195 per ton CO₂ will be introduced and will be applied to all government planning and profitability calculations.

2 Reform taxes, levies, fees and CO₂ pricing

The current system of taxes, levies, fees and CO₂ pricing will be fundamentally reformed in order to offer market incentives to switch to climate-friendly technologies. The Renewable Energy Sources Act (EEG) surcharge will be abolished, at the earliest by 1 January 2023 and latest by 1 January 2025, and the EEG costs financed entirely from the German Energy and Climate Fund. Proceeds from the EU Emissions Trading System and the German Fuel Emissions Trading System will be used to offset this funding. For this purpose, the CO₂ fixed prices in the Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz) will be raised to EUR 60 on 1 January 2023 and emission trading with a price corridor will be brought forward to 2024 and set to EUR 60–80. From 2025 the carbon floor price will be set to EUR 80. To avoid social upheaval, the maximum price will be EUR 100, rising in subsequent years by EUR 10 per year.

3 Avoid stranded assets

In order to avoid stranded assets and claims for compensation from private parties against the community of taxpayers, the use of fossil fuels in all areas of the national economy will be legally restricted to 1 January 2045. A law to this effect will be passed in 2022, in order to give all those involved 22 years to adjust.

4 Accelerate the market ramp-up of hydrogen

The hydrogen strategy will be revised in 2022. The aim of this is a faster market ramp-up. Domestic production based on renewable energies is the first priority and imports from neighboring European countries the second priority. This requires the rapid implementation of hydrogen pipelines (starter network) and storage capacity as well as a robust certification system. The revision will take into account that hydrogen will only be available in limited quantities in the foreseeable future and will be significantly more expensive than fossil energy carriers. State funding will therefore be used for a rapid market ramp-up in the steel and chemicals industry, for high-temperature processes and in cogeneration plants as a replacement for natural gas.

5 Increase public investment in climate change mitigation and cut environmentally harmful subsidies

The financial policy framework will continue to be developed so that the required scale of climate change mitigation investments can be made. Resources for public investment in climate change mitigation will be significantly increased over the next few years. Environmentally damaging subsidies will be gradually removed and the resources freed up by this used for environmental modernization.

6 Make public finances sustainable

Public funding and investment decisions will be aligned with the EU taxonomy for sustainable finances. Foreign trade promotion will be developed so as to be consistent with the goal of global climate neutrality.

7 Expand sustainability reporting obligations

In accordance with the sustainability reporting obligation, large companies and financial market actors will be obliged to report on climate risks and risks due to a CO₂-intensive business model in accordance with the framework of the *Task Force on Climate-related Financial Disclosures*. This requires the creation of scenarios with CO₂ damage costs of EUR 195 per ton.

Energy sector

8 Raise expansion goals for renewable energies

The share of renewable energies in electricity generation will be increased to at least 70 per cent by 2030. This requires an expansion of 80 GW onshore wind energy, 25 GW offshore wind energy and 150 GW photovoltaics (PV).

9 Introduce a carbon floor price in the electricity sector

A national carbon floor price will be introduced for the electricity sector, with the aim of creating planning security for the necessary reduction of fossil energy generation for all concerned. This protects the lower limit of the CO₂ price under the European emissions trading: it starts at EUR 50 in 2025 and rises to at least EUR 65 by 2030. This will end coal-fired power generation by 2030 and reduce the need

for subsidies under the Renewable Energy Sources Act to a minimum.

10 Make areas available for wind energy

An average of two per cent of the area in all federal states will be provided for the expansion of onshore wind energy. The regulations on the concentration zones in the German Federal Building Code (Baugesetzbuch) will be defined with the aim of giving wind energy adequate space.

11 Reconcile species conservation and climate change mitigation

In order to resolve the conflict of objectives between climate change mitigation and species conservation for the expansion of wind energy, the Federal Nature Conservation Act (Bundesnaturschutzgesetz) will define safety distances to breeding sites for all relevant bird species: these will then define where turbines are permitted, where they are permitted with measures and where they are prohibited. The safety distances ensure that the expansion of wind energy will not endanger the bird populations. As the conservation status of many bird species is under pressure from a large number of other factors, the Federal Government and federal states will start a program under the Joint Task for the *Improvement of Agricultural Structures and Coastal Protection* (GAK) with an annual budget of at least EUR 100 million.

12 Accelerate approval procedures, define upper minimum distances and simplify repowering

The approval procedures will be redrafted in an onshore wind energy act. The maximum processing time after the application has been deemed to be complete will be limited to 10 weeks without public consultation and 22 weeks with. If no decision is issued within the deadline, the application will count

as approved. While maintaining the environmental standards, the threshold for formal environmental impact assessments for wind parks will be increased from three to seven turbines. The upper minimum distances of wind turbines to residential areas (Section 249 German Federal Building Code, BauGB) will be uniformly set for all federal states to three times the turbine height (3H) and for the renewed use of existing sites (repowering) to 2H.

13 Promote offshore wind energy

The land-use development plans for the German exclusive economic zone (EEZ) and the site development plans for offshore wind energy will be adapted to the new long-term expansion targets for achieving climate neutrality (2030: 25 GW, 2035: 40 GW, 2040: 60 GW, 2045: 70 GW). In the case of competition for space, wind energy will be given priority as it is an essential requirement for climate neutrality.

14 Expand ground-mounted solar PV parks

The sites for subsidized and non-subsidized ground-mounted PV parks will be decided in future solely by local authorities through their development plans: all regulations on eligible areas in the Renewable Energy Sources Act will be abolished. Size limitations are also no longer applicable. Similar to wind energy, payments will also be introduced to local authorities for ground-mounted PV parks. Agricultural PV will be expanded.

15 Encourage prosumers

The rules for prosumers (for example, buildings with PV panels, heat pumps, electric cars and storage) will be radically simplified. Regulations for grid connection will be unified throughout Germany.

16 Introduce PV obligation

A duty to install solar panels will be introduced for new buildings and roof renovations.

17 Adapt network expansion to climate goals

Transmission grid planning will be quickly adapted to the new climate goals.

18 Accelerate energy complaint procedures

Two senates will be set up in the Federal Administrative Court to accelerate proceedings for turbine installation and power line construction. These will deal solely with decisions on energy law.

19 Decarbonize district heating

The use of district and local heating will be increased by 50 per cent to over eight million connected households by 2030. The share of climate-friendly heat generation will be doubled through the increased use of large-scale heat pumps, solar thermal energy, geothermal energy, industrial waste heat and green hydrogen. The expansion of district heating and its decarbonization will be funded to the sum of EUR 1.5 billion per annum. A price regulation will be introduced due to the monopoly position of district heating network operators.

20 Ensure security of supply

The security of supply will be ensured through the existing electricity market design, the reserves and continuous monitoring by the Federal Network Agency. All new gas-fired power plants must be hydrogen-ready so that in future the fuel can be converted from natural gas to hydrogen.

Industry

21 Introduce Carbon Contracts for Difference

In order to finance climate-neutral technologies in the raw materials industry, climate change mitigation contracts in the form of Carbon Contracts for Difference (CCfD) will be introduced by law. These will fund the cost differences between the climate-neutral technology and the proceeds which could be generated on the market. Refinancing the Carbon Contracts for Difference will be permanently ensured via a suitable instrument.

22 Promote investment through accelerated depreciation

Investment in climate change mitigation and high-efficiency technologies in industry will be promoted through investment grants and accelerated depreciation.

23 Reform network charges

The electricity network charges will be reformed in such a way as to provide incentives to industry for large scale heat pumps, Power-to-Heat and flexible load management.

24 Develop a circular economy strategy

A national circular economy strategy will be developed that reduces CO₂-intensive primary production of raw materials as well as waste incineration and closes resource and carbon cycles.

25 Introduce product-specific sustainability criteria

By introducing product-specific sustainability criteria and requirements for product design and recyclability, product downcycling and greenhouse gas emissions will be reduced. Digital marking on materials and products will make sustainability characteristics comparable and transparent.

26 Create lead markets for green materials

In order to create lead markets for green materials and products, particularly in the construction industry, public sector procurement will be consistently aimed at climate change mitigation and sustainability. This can be complemented by quotas for climate-neutral materials and other demand-side instruments.

27 Develop a CCS strategy

A strategy will be developed for carbon capture and storage (CCS) which, in cooperation with other European countries, will compensate for the unavoidable residual emissions (maximum 5 per cent) from 2030 and pave the way for negative emissions, so that climate neutrality can be achieved by 2045.

28 Develop a biomass strategy

A biomass strategy will be developed, based on an analysis of the sustainable biomass potential in Germany, which takes account of competing alternative uses and so regulates the application of bioenergy utilization in industry with CCS (BECCS).

Transport

29 Increase the stock of electric passenger cars

The necessary instruments will be created to increase the stock of electric cars to at least 14 million by 2030. The motor vehicle tax for newly registered vehicles will be changed so as to develop a clear steering effect towards electric cars through a visible price signal when buying a car. The company car taxation will be reformed in order to remove the negative subsidy effects on the climate due to combustion engine vehicles. At European level, the German Federal Government will support highly ambitious CO₂ fleet emission standards.

30 Electrify road kilometers for lorries

Electrification of lorries will be accelerated, with the aim of achieving one third CO₂-free road kilometers for lorries by 2030. This will be achieved through relief from the lorry toll for zero emission vehicles, a tightening of CO₂ fleet emission standards by the EU and innovation corridors for the lorries of the future. The lorry toll will be extended to all roads.

31 Ensure the required expansion of the charging infrastructure

The charging infrastructure master plan will be further developed. This contains a vision for the expansion of the charging infrastructure and a package of instruments that will enable the targets to be reached. The vision includes the gradual expansion of Vehicle-to-Grid, that is, the capacity for bidirectional charging.

32 Expand the rail network

The rail network will be expanded with the aim of doubling passenger numbers and achieving a 25 per cent share of freight traffic. Funding will be provided for technologies for digitalization, automation and electrification of rail transport and additional loading and unloading facilities will be created for freight transport across the country.

33 Improve local public transport (LPT)

Local public transport will be improved with the aim of doubling passenger numbers by 2035 at the latest. This requires a joint effort from the Federal Government, federal states and local authorities who are responsible for local services. The aims include an increase in attractiveness, particularly through fast and coordinated connections, as well as a switch to buses and trains with zero emission drives.

34 Plan sustainable transport infrastructure

The Federal Transport Infrastructure Plan (FTIP) will be adapted to the requirements of a climate-neutral Germany in 2045. The review of the requirements plan set for December 2021 will be used to introduce a reorientation. Priority will be given to maintaining the substance of the transport infrastructure. The available budget resources will be primarily used for expanding the rail network. The review of the requirements plan will be completed in 2023. In 2024 the expansion legislation will be adapted for the different modes of transport.

35 Abolish environmentally damaging privileges for air transport

Financial privileges for air transport will be removed. Aviation Tax (Luftverkehrsteuer) rates will be raised to the level of the value added tax rate of 19

per cent. At EU-level, the German Federal Government will advocate a tax on jet kerosene under the EU Energy Tax Directive and the removal of the free allocation of certificates in the EU Emissions Trading Scheme (EU ETS) for internal European air transport.

36 Support local authorities for the mobility transition in towns and cities

Initial changes to road traffic legislation will be made via an immediate action program. The regulatory purpose of road traffic legislation will be expanded and in future will include climate and environmental protection, health protection, the safety of all road users and support for sustainable urban development. The scope for action by local authorities will be expanded. They will obtain better options for controlling the traffic according to their own objectives, re-allocating public spaces and giving weaker road users priority.

37 Introduce maximum speeds throughout the country

The maximum speed on all German motorways will be set to 130 km/h and in built-up areas to 30 km/h. Local authorities can deviate from this rule in special circumstances and prescribe a speed limit of 50 in built-up areas.

Buildings

38 Establish climate neutrality in the building sector

All funding programs, building energy efficiency law and property management for federally owned buildings will be systematically directed towards the aim of climate neutrality by 2045. This also applies to the Administrative Agreement between the

German Federal and State Governments on urban development and to social housing development.

39 Raise energy standards for new and old buildings

In the Building Energy Efficiency Act (Gebäudeenergiegesetz, GEG) the energy requirement for new buildings from 2024 is specified as the level "Efficiency house 40". After this date it will no longer be permitted to install heating systems that use fossil fuels. The GEG lays down increased energy efficiency requirements for any significant alterations to existing buildings: replacement building components must conform to the target level of an "Efficiency house 70". The installation of heating systems operated with fossil fuels in detached or semi-detached houses is likewise not permitted after 2024. Exceptions will be permitted in special cases.

40 Expand and further develop building subsidies

Twelve billion euros per annum will be provided for funding climate-neutral new buildings and building renovation. In future, compliance with the legal requirements will form an explicit part of the funding framework.

41 Make renovation roadmaps obligatory

Building-specific renovation roadmaps will be given more weight as an advisory instrument. Setting up renovation roadmaps will become mandatory with a change in the owner or a new tenancy agreement. A minimum energy efficiency standard will be introduced so that existing buildings with the worst energy efficiency amongst the commercial property are renovated quickly. These renovations will be funded separately.

42 Provide CO₂ price relief to tenants

From 2023 it will no longer be permitted to pass on the costs arising from CO₂ pricing under the Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz, BEHG) to tenants, so that landlords have an incentive to carry out energy efficiency renovations and switch to zero CO₂ heating systems. Legal conditions will be created for a gradual expansion of all-inclusive rents for new and existing tenancies in order to further strengthen this incentive.

43 Lower the modernization allocation

The modernization levy for energy efficiency renovation will be lowered to 1.5 per cent. In future, grants do not have to be deducted from the apportionable costs, thus remaining with the building owner ("thirds model").

44 Introduce compulsory municipal heat planning

Following the example of Baden-Württemberg, all federal states will be obliged to introduce compulsory municipal heat planning for all the larger local authorities. Seasonal heat accumulators and the limited potential of biomass and green hydrogen must be included in the plans.

45 Funding serial renovation

A one-off EUR 10 billion funding program will herald the market introduction of industrial energy efficiency renovation (Energiesprong). In order to meet the lack of skilled tradespeople, new apprenticeships will be introduced at the interface between trades, planners and architects, and support given for re-training.

46 Increase incentives for heat pumps

Heat pumps are a key technology for the heat transition. Funding and restructuring of the levies, fees and payments on electricity make the installation and operation of a heat pump almost as cheap nowadays as oil or gas heating. They will therefore become cost-effective and efficient standard solutions in new buildings and for detached and semi-detached houses in the building stock when, in 2024, the installation of new fossil fuel heating systems is no longer legal except in special cases.

Agriculture

47 Introduce nutrient accounting

Nutrient accounting will be introduced at individual farm level in order to limit balance surpluses. This will be supported by a future tax on mineral nitrogen.

48 Increase VAT on animal products

The privileged treatment of animal products in relation to VAT will be ended. In future animal products will be subject to the standard rate of 19 per cent. The additional revenue will be used to support climate-friendly agriculture.

49 Develop a future vision for livestock farming

A long-term sustainable vision for livestock farming will be developed in cooperation with livestock farmers, trade and consumer associations. The aim for the future is fewer animals, improved animal welfare, stable incomes and good food.

50 Develop a peatland conservation strategy

As peatlands used for agriculture are responsible for a large proportion of the greenhouse gas emissions by agriculture, a peatland conservation strategy will be developed. This will pursue the aim of extensive rewetting by 2045 and the environmentally friendly economic use of the rewetted peatlands.

3 Detailed description of proposals

1 Make the Federal Climate Change Act more effective

If the sectoral targets fail to be met, an automatic adjustment mechanism will be introduced to the Federal Climate Change Act (raising the CO₂ price or measure with comparable effect) in order to avoid shifting attainment of the climate goals onto later generations, in line with the ruling of the Federal Constitutional Court. For public authorities a CO₂ shadow price at the level of the CO₂ damage costs of EUR 195 per ton CO₂ will be introduced and will be applied to all government planning and profitability calculations.

Background:

The amendment to the Climate Change Act following the ruling by the Federal Constitutional Court provides for a reduction in greenhouse gas emissions by at least 65 per cent by 2030 and climate neutrality by 2045. However, there are no annual sectoral targets for the energy industry for 2030 nor an effective adjustment mechanism in case the annual targets are not met. The Federal Constitutional Court's provision not to transfer too much of the emission reduction burden to the younger generation is therefore in jeopardy.

Current CO₂ prices are still a long way from reflecting the costs actually generated. Many companies have therefore moved to working with CO₂ shadow prices in their internal profitability calculations. The German Federal Environment Agency (UBA) has calculated damage costs of EUR 195 per ton CO₂.

Regulation proposal:

For the period to 2030 the Climate Change Act will formulate annual sectoral targets, including for the energy industry. In addition, an automatic adjustment mechanism will be introduced: if buildings and transport do not both reach their sectoral targets, the CO₂ floor price in the Fuel Emission Trading Act (Brennstoffemissionshandelsgesetz, see Item 2) will increase automatically by EUR 15 at the start of the following year.

The same applies to the CO₂ floor price in the electricity sector if the energy industry sectoral target is missed. The German Federal Government can override this automatic effect by presenting the Bundestag with other effective measures to close the climate gap.

In addition, a CO₂ shadow price equal to the CO₂ damage costs of EUR 195 per ton will be set for the public sector. This price will be applied to all profitability calculations, such as for public procurement or the quantification of the climate impacts of planned investments.

Explanation:

Our study *Towards a Climate-Neutral Germany by 2045* has demonstrated an internally consistent scenario for achieving the interim goal of at least minus 65 per cent by 2030, from which the annual sectoral targets can be inferred for the energy industry up to 2030.

The proposal is based on the following publications:

Agora Energiewende (2021): *Sechs Eckpunkte für eine Reform des Klimaschutzgesetzes*

Prognos/Öko-Institut/Wuppertal Institut (2021): *Towards a Climate-Neutral Germany by 2045. Study*

commissioned by the Stiftung Klimaneutralität, Agora Energiewende and Agora Verkehrswende

2 Reform taxes, levies, fees and CO₂ pricing

The current system of taxes, levies, fees and CO₂ pricing will be fundamentally reformed in order to offer market incentives to switch to climate-friendly technologies. The Renewable Energy Sources Act (EEG) surcharge will be abolished, at the earliest by 1 January 2023 and latest by 1 January 2025, and the EEG costs financed entirely from the German Energy and Climate Fund. Proceeds from the EU Emissions Trading System and the German Fuel Emissions Trading System will be used to offset this funding. For this purpose, the CO₂ fixed prices in the Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz) will be raised to EUR 60 on 1 January 2023 and emission trading with a price corridor will be brought forward to 2024 and set to EUR 60–80. From 2025 the carbon floor price will be set to EUR 80. To avoid social upheaval, the maximum price will be EUR 100, rising in subsequent years by EUR 10 per year.

Background:

The EEG funding surcharge has guaranteed a stable framework for the expansion of renewable energies for over two decades. In order to progress to climate neutrality, a far-reaching electrification of the other economic sectors will be essential. The EEG surcharge stands in the way of this development as it increases the cost of using electricity. It therefore requires a fundamental reform of the system of taxes, levies and fees and the CO₂ pricing. The use of electricity must become cheaper and the use of fossil energies more expensive. In future the EEG should be financed from the Federal budget (Energy and Climate Fund, ECF).

On 1 January 2021 a CO₂ price of EUR 25 per ton was introduced under the Fuel Emission Trading Act (BEHG) for the transport and heat sectors in Germany. The EU Emissions Trading System has provided CO₂ pricing for the energy industry and other sectors of industry since 2005.

The BEHG sets a fixed price for 2021 to 2025 that rises to EUR 30 per ton by the start of 2022 and EUR 55 by 2025. Certificates can be traded from 2026 and the price then forms in a price corridor between EUR 55 and EUR 65; from 2027 a decision will be taken about free trade. The revenue goes into the Energy and Climate Fund and currently ensures that the EEG surcharge is stabilized or lowered slightly: from 2024 it will also contribute to offsetting the funding of the increased commuting allowance.

CO₂ pricing is an important instrument for achieving national and international climate goals. However, the current level in the BEHG is insufficient to produce the required incentives. The price must therefore be rapidly increased.

Regulation proposal:

The Renewable Energy Sources Act (EEG) surcharge will be abolished, at the earliest by 1 January 2023 and latest by 1 January 2025, and the EEG costs financed entirely from the German Energy and Climate Fund.

An amendment to the BEHG will allow a gradual increase in the CO₂ price. The level of this will be determined by the necessary climate policy incentive effect, but will take account of social factors and a targeted use of the income. This means that:

The CO₂ fixed prices in the Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz) will be raised to EUR 60 on 1 January 2023 and emission trading with a price corridor will be brought forward to 2024 and set to EUR 60–80. From 2025 the

carbon floor price will be set to EUR 80. To avoid social upheaval, the maximum price will be EUR 100, rising in subsequent years by EUR 10 per year.

In order to avoid any additional hardship for lower income groups, climate housing allowance will be raised in line with the increasing CO₂ price. A separate transformation fund will also be set up for low-income households to enable them to change over to heat pumps and electromobility through increased subsidy rates.

Explanation:

This reform will make electricity cheaper and fossil energies more expensive. Market forces are working in the right direction.

Every member of the public will benefit from the lowering of the EEG surcharge. It is also socially progressive, in other words, lower income groups will benefit more than higher ones. At the same time the use of electricity-based technologies in transport, buildings and industry will be more economically attractive. The increasing use of these technologies is essential for achieving the climate neutrality targets. A rise in the CO₂ price means that the Government will no longer need to subsidize in the face of distorted market forces using scarce tax revenues. The climate housing allowance and transformation fund will offset particular social hardships. Funding for climate-friendly replacements will ensure that these households benefit from low electricity prices.

The higher CO₂ price enhances the climate policy incentive effect and sends a clear signal for investment in climate-neutral technologies as well as climate-friendly consumption behavior. The early resolution creates clarity and planning security for the economy.

Account must be taken of the further development of measures in the context of the European Green Deal.

The EU Commission is currently working on a package of measures with the title *Fit for 55*. There is discussion on the further development of the EU ETS with a possible inclusion of additional sectors such as transport and heating, and the setting up of a separate trading system for these sectors. A system of this kind, if it is proposed by the Commission, would likely only be launched in 2025 at the earliest. National measures will continue to be necessary at least until then and therefore a further development of the BEHG.

The proposal is based on:

Agora Energiewende (2018): *Eine Neuordnung der Abgaben und Umlagen auf Strom, Wärme, Verkehr. Optionen für eine aufkommensneutrale CO₂-Bepreisung von Energieerzeugung und Energieverbrauch*

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

Matthes, Felix Chr./Schumacher, Katja et al. (2021): *CO₂-Bepreisung und die Reform der Steuern und Umlagen auf Strom: Die Umfinanzierung der Umlage des Erneuerbare-Energien-Gesetzes*. Study by the Öko-Institut on behalf of the Stiftung Klimaneutralität

3 Avoid stranded assets

In order to avoid stranded assets and claims for compensation from private parties against the community of taxpayers, the use of fossil fuels in all areas of the national economy will be legally restricted to 1 January 2045. A law to this effect will be passed in 2022, in order to give all those involved 22 years to adjust.

Background:

In Germany 80 per cent of the primary energy consumption is still based on the fossil energy carriers petroleum, coal and natural gas. The aim of climate neutrality by 2045 means that Germany must end the use of fossil fuels over this period.

As many plants have depreciation periods of 20 years or more, an end date for the use of fossil fuels must be legally established without delay in order to prevent bad investments and claims for damages by companies and private individuals against the state. This applies in particular to the use of fossil energy carriers in electricity generation, industrial plants, transport and heating systems.

Regulation proposal:

The use of fossil fuels for electricity generation and in industrial plants will no longer be permitted after 1 January 2045. An exception to this is the use of CCS/CCU (*Carbon Capture and Storage, Carbon Capture and Utilization*), as long as the operator guarantees that greenhouse gases released during use are completely captured and permanently stored. The use of fossil fuels in transport and heating systems is also not permitted after 1 January 2045.

No natural gas will be allowed to be transported in gas pipelines after 1 January 2045. The depreciation periods under the gas network regulation must be adjusted accordingly. An exception to this exists for the supply of systems in which greenhouse gases released by using natural gas are completely captured and permanently stored.

The above-named deadlines will be embodied in the relevant laws.

Explanation:

Climate neutrality means that Germany must completely end the use of the fossil energy carriers coal, natural gas and petroleum by 2045. Bad investments in fossil-driven systems that run over several decades and could lead to an expensive lock-in should therefore be avoided.

There is a need for a clear and long-term regulatory framework, especially in the areas with long-lived capital goods, in order to prevent stranded assets on the way to a climate-neutral economy. This needs to be codified in law by 2022 because, from an economic and legal perspective, it is crucial that the transitional period between the date the objective is set in law on the one hand and the date for achieving the objective on the other is as long as possible. This will give companies and members of the public enough time to make the changeover. A legal deadline for the use of fossil fuels creates planning security and legal compliance for the businesses involved, so that they can direct their investments towards climate-neutral technologies in good time.

The proposal is based on:

Becker Büttner Held (2021): *Fehlinvestitionen vermeiden – Eine Untersuchung zu den rechtlichen Möglichkeiten und Grenzen zur Defossilisierung der deutschen Volkswirtschaft bis 2045*. Legal opinion on behalf of the Stiftung Klimaneutralität

4 Accelerate the market ramp-up of hydrogen

The hydrogen strategy will be revised in 2022. The aim of this is a faster market ramp-up. Domestic production based on renewable energies is the first priority and imports from neighboring European countries the second priority. This requires the rapid implementation of hydrogen pipelines (starter network) and storage capacity as well as a robust

certification system. The revision will take into account that hydrogen will only be available in limited quantities in the foreseeable future and will be significantly more expensive than fossil energy carriers. State funding will therefore be used for a rapid market ramp-up in the steel and chemicals industry, for high-temperature processes and in cogeneration plants as a replacement for natural gas.

Background:

Hydrogen is a key technology for climate neutrality. On cost and efficiency grounds it should be used primarily where a direct use of electricity is not technically possible. It is used for production processes in the steel and chemicals industries, for generating electricity and district heating if renewable energies cannot meet the demand, and in shipping, aviation and heavy vehicle transport. In 2030 this will require approx. 60 TWh of hydrogen. By 2030 the installation of 10 GW electrolyzers as well as a reliable import infrastructure and incentives for international H₂ supplies will be required.

Regulation proposal:

A hydrogen strategy 2.0 builds on the existing Federal Government hydrogen strategy and expands and details the measures laid out there.

Key generation points are:

- raising the electrolyzer target to 10 GW in 2030 linked to funding programs (investment grants for electrolyzers, on-site generation programme);
- development of a hydrogen starter network to prioritize supplies to industrial centers;
- setting up a forum of hydrogen neighbors as a coordination platform for questions in relation to supply (particularly the North Sea) and infrastructure and

- sector-specific supply contracts to fund domestic and imported hydrogen through competition.

Key points for demand are:

- developing a robust certification system;
- hydrogen use in steel and chemicals production through Carbon Contracts for Difference;
- transforming the Combined Heat and Power Act (Kraft-Wärme-Kopplungsgesetz, KWKG) into a market ramp-up instrument for hydrogen in CHP plants and
- introduction of a PtL quota (PtL – Power-to-Liquid) in aviation.

Explanation:

Large amounts of hydrogen will be required quickly in order to enable industry to transform in the direction of climate neutrality. The aim now in the iron and steel industry is to guide reinvestment from the emission-intensive blast furnace route based on coal coke towards a hydrogen-driven direct reduction plant (DRI plants). In the raw materials industry, around half of all industrial plants are due for reinvestment in the next ten years. Production processes such as steam generation based on fossil energy carriers need to be converted to renewable energies and hydrogen.

However, renewable hydrogen currently costs two to three times as much to produce as hydrogen generated from fossil fuels. Increasing the CO₂ price in the BEHG and reforming the levies and fees on electricity are important levers to reduce this cost difference to some extent. Funding instruments will also be required, particularly in the market ramp-up phase, in order to reduce the cost difference between natural gas and renewably generated hydrogen. Iron and steel production, the basic chemicals industry and electricity and district heating generation also

require funding instruments on the demand side so that hydrogen can replace fossil energy carriers.

Funding for hydrogen will be mainly focused on the steel and chemicals industry sectors, electricity and district heating generation and shipping, aviation and heavy goods transport. Other sectors such as heating and car transport have much more efficient alternatives to using hydrogen. Using synthetic methane in the gas-fired condensing boiler requires about six times the amount of renewable energy compared to an electric heat pump. Running an internal combustion vehicle using synthetic fuel requires around five times as much RE electricity as is needed for its use in an electric car. Scarce government resources should therefore be used where there is no alternative to hydrogen.

The proposal is based on:

Agora Energiewende/AFRY Management Consulting (2021): *No-regret hydrogen: Charting early steps for H₂ infrastructure in Europe*

Guidehouse (2021): *A regulatory architecture for hydrogen*. Study on behalf of Agora Energiewende

Matthes, Felix Chr./Braungardt, Sibylle et al. (2021): *Die Wasserstoffstrategie 2.0 für Deutschland*. Study by the Öko-Institut on behalf of the Stiftung Klimaneutralität

5 Increase public investment in climate change mitigation and cut environmentally harmful subsidies

The financial policy framework will continue to be developed so that the required scale of climate change mitigation investments can be made. Resources for public investment in climate change mitigation will be significantly increased over the next few years. Environmentally damaging subsidies will

be gradually removed and the resources freed up by this used for environmental modernization.

Background:

Transforming the German economy requires annual public investments in the mid two-digit billion Euro range, something not adequately taken into account in current financial planning. Accelerating the transformation requires greater fiscal scope. The repayments of the public debt taken on to limit the Corona pandemic and earmarked under the debt brake, as well as state investment requirements in other growth fields (for example digitalization) must not be allowed to hold up climate protection under any circumstances.

An important step to safeguard income in this context is the overdue phase-out of environmentally damaging subsidies, which also gives a stimulus to accelerated climate neutrality. If the transformation is not to be funded by new or higher taxes, then further room for maneuver must be created by reforming the debt rules and/or the development of investment budgets.

Regulation proposal:

The German Federal Government will present a comprehensive plan that earmarks adequate funds for state investments for transforming the German economy and for climate neutrality by 2045, and is based on an independent quantification of the total economic investment required. The possibility of legally independent investment budgets will be used for this. Changes in the German fiscal regulations required for this transformation will be carried out as quickly as possible.

Environmentally damaging subsidies will be gradually phased out:

- The commuting allowance will first be reduced and then transformed into a uniform tax credit per kilometer distance, deductible from the income tax liability ("mobility payment").
- Taxation on the private use of service and company cars will be reformed in line with environmental goals (see Item 29).
- The energy tax rebate for diesel (diesel privilege) will be gradually phased out during the legislative period.
- The energy tax exemption for kerosene will be abolished in the European context under the EU Energy Tax Directive.
- The German Federal Government will support this as part of the current reform (see Item 35).
- The Value Added Tax exemption for international flights will be offset by an appropriate increase in the Aviation Tax (see Item 35).
- Environmentally harmful agriculture subsidies (for example, a reduced tax rate on animal products and tax relief on agricultural diesel) will be abolished (see Item 48).

Explanation:

The German national debt has risen sharply in recent months as a result of the Covid-19 pandemic. This is basically not a problem given the current negative interest on German Government securities and a relatively low interest rate. However, due to the debt brake, the repayment obligations on these debts threaten to severely restrict the financial scope for the necessary investments after 2023.

A key aim of the next Federal Government must be to put forward a funding plan as quickly as possible that enables the German economy to transform in the direction of climate neutrality. One option for this is to set up legally independent investment budgets which would be able to make public funds available for climate protection investments. A fundamental reform of the national debt regulations might be considered. The argument that additional

debts are not compatible with the principle of inter-generational equity does not hold, because the neglect of climate protection is a significantly greater burden for future generations compared to debt repayment obligations.

Environmentally damaging subsidies thwart attempts to achieve the climate change objectives. At present Germany is subsidizing environmentally damaging activities by over EUR 50 billion per year. Removing these will contribute to reducing emissions by up to 100 million tons CO₂-equivalents per year. Phasing out the above-mentioned subsidies will release additional funds for environmental transformation.

Amongst other sources, the proposal is based on:

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

Forum Ökologisch-Soziale Marktwirtschaft e. V. (2020): *Zehn klimaschädliche Subventionen im Fokus. Wie ein Subventionsabbau den Klimaschutz voranbringt und den Bundeshaushalt entlastet*

Global Climate Forum (2021, i. E.): *Wie finanziert man die notwendigen Klima-Investitionen? Die Rolle der außerbilanziellen Finanzierung in der deutschen Klimapolitik.* Study on behalf of Agora Energiewende

6 Make public finances sustainable

Public funding and investment decisions will be aligned with the EU taxonomy for sustainable finances. Foreign trade promotion will be developed so as to be consistent with the goal of global climate neutrality.

AND

7 Expand sustainability reporting obligations

In accordance with the sustainability reporting obligation, large companies and financial market actors will be obliged to report on climate risks and risks due to a CO₂-intensive business model in accordance with the framework of the *Task Force on Climate-related Financial Disclosure*. This requires the creation of scenarios with CO₂ damage costs of EUR 195 per ton.

Background:

The financial sector plays a crucial part in enabling and accelerating the transition to climate neutrality: up to now the climate risks linked to investment and financial decisions by private and public actors have been largely ignored. This results in funds being misdirected and the threat of failed investment worth billions in the medium term.

At the European level the development of a sustainable financial sector is slowly gaining momentum. A key instrument is the EU Sustainable Finance Taxonomy passed in 2020. However, the regulation submitted in April 2021 for the climate-related aspects of the taxonomy is not consistent with the Paris Climate Goals in its current form for all sectors. Along with the Taxonomy Regulation, the EU Commission has published a proposal for a revision of the Non-Financial Reporting Directive. Corporate sustainability reporting obligations will be significantly expanded and made subject to audit.

Germany is also aiming to speed up conversion of the financial sector. In a final report presented in February 2021, the Sustainable Finance Committee set up by the German Federal Government proposed far-reaching measures to bring the German financial sector into line with the Paris Climate Goals and other sustainability goals. However, only some of the recommendations are contained in the Sustainable

Finance Strategy presented in May 2021 by the Federal Ministry of Finance.

Regulation proposal:

The Federal Government will present an ambitious action plan for expanding sustainable financial activities in Germany at the earliest opportunity. The action plan is based on the recommendations by the Sustainable Finance Committee.

The EU Taxonomy which will be continuously developed at European level will be applied as a screening instrument (minimum standard) for public investment and funding programs. Expansion of the taxonomy to the requirements of the whole economic transformation will be developed in Germany as quickly as possible and included in the European discussion. A climate reporting duty for public expenditure will be introduced, based on the EU Taxonomy. All activities by public financial institutions such as the Kreditanstalt für Wiederaufbau (KfW) will be orientated towards the Paris Climate Goals as well as the Sustainable Development Goals (SDGs); the KfW mandate as a "transformation bank" will be adapted accordingly. The investment policy for the Government's special funds as well as foreign trade promotion will be brought into line with the Paris Climate Goals.

Sustainability reporting duties for companies will be expanded. The area of application will be extended to all companies with a relevant risk and impact effect. A forward-looking climate reporting duty based on the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) will be introduced from the 2022 reporting year. Sustainability reporting duties will be subject to audit and integrated in the planned European Single Access Point (ESAP). In order to make transformation risks and opportunities comparable, companies with a relevant risk and impact effect as well as large financial

market actors will be obliged to use a CO₂ shadow price of EUR 195 for stress tests.

Explanation:

The public sector has a pioneering and signal function in its capital spending and investment behaviour. Pension and special funds must be restructured accordingly and tax revenues may not be used to subsidise investments that are not in line with the goals of the Paris Agreement, either at home or abroad.

The EU Taxonomy Regulation is an important step but one which is not consistent with the Paris Climate Goals in its current form. The underlying threshold values for emission-intensive transformation sectors are not yet fully consistent with the goal of a climate-neutral EU in 2050. In addition, the first delegated act only covers about 80 per cent of European emissions. The aim must be for the EU Taxonomy to assign threshold values for all sectors that are consistent with the European Climate Goals and complement this with sectoral transformation paths as well as other sustainability criteria (for example, the circular economy and biodiversity). This is a prerequisite for permanently redirecting financial flows.

In order to bring transparency to the transformation opportunities and risks of individual companies and economic activities, a "climate neutrality" scenario needs to become part of the forward-looking reporting obligations in the framework of stress tests. To achieve this, companies falling within the scope of the Non-Financial Reporting Directive (NFRD), in future the Corporate Sustainability Reporting Directive (CSRD), and within the framework of the obligatory stress tests in the financial system, will be subject to a simplified CO₂ shadow price of EUR 195.

8 Raise expansion goals for renewable energies

The share of renewable energies in electricity generation will be increased to at least 70 per cent by 2030. This requires an expansion of 80 GW onshore wind energy, 25 GW offshore wind energy and 150 GW photovoltaics.

Background:

Sufficient amounts of electricity from renewable energies are an essential requirement for climate neutrality. Beyond the traditional use of electricity, large amounts of renewable energy are required for converting the industry, buildings and transport sectors.

By 2030, 80 GW onshore wind energy, 25 GW offshore wind energy and 150 GW PV will be needed, which in total will generate 435 TWh of electricity. The expansion targets currently laid down by the EEG of 100 GW PV and 71 GW onshore wind energy, and the 20 GW set in the Offshore Wind Energy Act (Windenergie-auf-See-Gesetz, WindSeeG) are insufficient and must be increased. The same applies to the electricity output trajectory in the EEG that currently has no target for 2030 and one of 376 TWh for 2029.

Regulation proposal:

For 2030 the EEG will set a share of at least 70 per cent of the gross electricity consumption for renewable energies (instead of the current 65%).

The EEG will define an expansion trajectory with a 2030 target of 80 GW of onshore wind energy and 150 GW of PV. The electricity trajectory will be raised and a target of 435 TWh set for 2030. The annual interim targets will be adapted accordingly. The WindSeeG will specify a target of 25 GW for 2030 and 60 GW for 2040.

Explanation:

The measures adapt the targets set out in the EEG and WindSeeG in terms of RE share, installed capacity and quantity of electricity generated to the goal of climate neutrality by 2045, and a reduction in greenhouse gases of at least 65 per cent by 2030. The increase in the targets is needed on the one hand for reasons of consistency with other measures (ramp-up of hydrogen, phase-out of coal, expansion of electromobility and heat pumps). On the other hand, a clear stipulation of the expansion quantities and electricity generation targets is essential in order to create adequate planning security for all those involved. Due to the particularly long planning period for offshore wind energy, target setting is essential up to 2040.

The proposal is based on:

Agora Energiewende/Wattsight (2020): *Die Ökostromlücke, ihre Strommarkteffekte und wie die Lücke gestopft werden kann*

Prognos/Öko-Institut/Wuppertal Institut (2021): *Towards a Climate-Neutral Germany by 2045*. Study commissioned by the Stiftung Klimaneutralität, Agora Energiewende and Agora Verkehrswende

9 Introduce a carbon floor price in the electricity sector

A national carbon floor price will be introduced for the electricity sector, with the aim of creating planning security for the necessary reduction of fossil energy generation for all involved. This protects the lower limit of the CO₂ price under the European emissions trading: it starts at EUR 50 in 2025 and rises to at least EUR 65 by 2030. This will end coal-fired power generation by 2030 and reduce the need for subsidies under the EEG to a minimum.

Background:

The energy industry is still the sector with the highest greenhouse gas emissions in Germany. The principal sources are coal-fired power plants. The Coal-fired Power Generation Termination Act (Kohleversorgungsbeendigungsgesetz, KVBG) has stipulated the end of coal-fired power generation in Germany by 2038 at the latest. For 2030 the decommissioning path is based on the superseded sectoral target for the energy industry in the 2019 Climate Change Act. The amendment to the Climate Change Act currently submitted for resolution in the Bundestag provides for an increase to the 2030 climate target of at least a 65 per cent reduction in greenhouse gases.

This implies a significant reduction to the 2030 sectoral target set by the energy industry. The result is an end to coal-fired power generation by 2030.

The EU Commission has announced that it will present a reform proposal for the EU Emissions Trading System (EU ETS) in July of this year, in order to adapt it to the new EU climate goals. This will likely result in a further rise in CO₂ prices. However, the reliability and predictability of the CO₂ price signal plays a crucial role in the decarbonization of the electricity sector. Experience since the introduction of emissions trading in 2005 shows that the price development was very irregular and difficult to predict. This can result in the necessary investments in climate-friendly technologies failing to take place.

Regulation proposal:

A national carbon floor price will be introduced for greenhouse gas emissions from electricity generation. This applies from 1 January 2025 and is EUR 50 per ton CO₂ in the first year. The trajectory for the carbon floor price will reach at least EUR 65 per ton CO₂ in 2030. The carbon floor price will be introduced by adjusting energy taxation (Energy Tax Act, EnergieStG). Tax rates for the use of coal, natural gas

and petroleum to generate electricity are set down in the EnergieStG and apply in addition to the EU ETS, where the current CO₂ price in the EU ETS is calculated at the level of the tax rate. The regulation for electricity price offsetting for energy-intensive companies will be adjusted in order to take account of the potentially higher CO₂ costs due to the carbon floor price. The potential financial revenue will benefit the German Energy and Climate Fund (Energie- und Klimafond, EKF) and will be used to cancel allowances in the EU ETS if this is not already guaranteed through the market stabilization reserve. This will prevent extra emissions in other places. The level of the trajectory for the carbon floor price will be regularly checked for its effectiveness in reaching the climate goals in the electricity sector. In addition, Germany will try to cooperate with neighboring European states on the carbon floor price.

Explanation:

In order to reach a higher climate target for 2030, it is essential that all sectors make their contributions to reducing emissions. However, without resolute decarbonization in the electricity sector, the electrification of the other sectors will achieve nothing because no overall reduction in greenhouse gases will occur. The carbon floor price will back up the expected emission reductions in the electricity sector through reforms at the European level. It ensures an ambitious price trajectory, thus creating planning security for the necessary investments in the electricity market. A two year transition period will allow for any forward transactions which have already been made. The planned cancellation of certificates will ensure that a waterbed effect is avoided. The method conforms with European law and is constitutionally sound by being based on the established energy tax. As a result, through raised targets at European level and this proposal, the coal phase-out in electricity generation can be brought forward to 2030. Unlike setting new specific shut-down dates for individual lignite power plants,

introducing the carbon floor price removes the need to renegotiate the public-law contract with the lignite companies.

The proposal is based on:

Agora Energiewende (2018): *Eine Neuordnung der Abgaben und Umlagen auf Strom, Wärme, Verkehr. Optionen für eine aufkommensneutrale CO₂-Bepreisung von Energieerzeugung und Energieverbrauch*

Hermann, Hauke/Matthes, Felix Chr./Keimeyer, Friedhelm (2021): *Konzept für die Einführung eines CO₂-Mindestpreises im Stromsektor in Deutschland.* Study by the Öko-Institut on behalf of the Stiftung Klimaneutralität

Kahl, Hartmut (2021): *Zur Umsetzbarkeit eines nationalen CO₂-Mindestpreises im Stromsektor.* Legal opinion by the Stiftung Umweltenergierecht on behalf of the Stiftung Klimaneutralität

Weyer, Hartmut (2018): *Rechtliche Bewertung einer CO₂-orientierten Energie- und Strombesteuerung sowie einer Ausweitung der EEG-Umlage auf Verbraucher im Wärme- und Verkehrssektor, Anhänge 6.3 und 6.4;* in: E-Bridge/ZEW/TU Clausthal, Neue Preismodelle für die Energiewirtschaft. Reform der Struktur von Netzentgelten und staatlich veranlasseter Preisbestandteile. Expert report on behalf of Agora Energiewende

10 Make areas available for wind energy

An average of two per cent of the area in all federal states will be provided for the expansion of onshore wind energy. The regulations on the concentration zones in the German Federal Building Code (Baugesetzbuch) will be defined with the aim of giving wind energy adequate space.

Background:

Wind energy is Germany's most important energy source for reaching the climate goals. The demand for onshore installed wind energy capacity will rise to 80 GW by 2030 and 145 GW by 2045. The tendered quantities for wind energy need to be raised to 6.5 GW per year. At the end of 2020 there were only 55 GW installed. Expansion of onshore wind energy has slumped massively over the last three years. One of the major reasons for this is a lack of available sites.

According to current estimates, an average share of the regional and municipal land surface of 2 per cent will be required for wind energy in the transformation to climate neutrality. With the present-day 0.9 per cent we are still a long way from this. The current regulatory structure of the German Federal Building Code, its application in local authority areas and the administrative court rulings on this have not resulted in the provision of enough land.

Regulation proposal:

A revision of what is known as concentration zone planning will be codified in the German Federal Building Code (Section 35 BauGB). This will set out the area requirement for wind energy utilization in Germany. This averages 2 per cent of the regional and municipal land areas in order to reach the target of climate neutrality. The legislator will apply uniform rules for calculating a share of each federal state and local authority area. This is the wind energy contribution value. It will be determined in an annex to the Act in the unit of measurement of km² for all local authority areas. In future, concentration zone planning will only be permissible if wind energy is assigned sufficient space.

Explanation:

This proposal is based on the assumption that all local authorities and federal states will make an appropriate contribution to climate neutrality and none of them fail to participate. The proposed regulation will enable local authorities and federal states to control the spatial distribution of wind turbines. However, they must provide wind energy with sufficient land area. In order to avoid arguments in court as to what constitutes "sufficient", it is proposed that the requirement is determined by the Federal legislator. The areas of land required will be distributed amongst the regional and local authorities according to a standard procedure. Each local authority will receive a minimum share which takes particular account of differences in population density and wind abundance.

No obligation to plan and identify concentration zones for wind energy will be introduced for either the local or regional authorities. However, only this kind of concentration zone planning, whose total area is at least equal to the wind energy contribution value, will avoid the need for wind turbines in the remaining external area. This will create a positive incentive to provide sufficient land area for wind energy generation.

The decision about who plans concentration zones will continue to be made at the local level. This could be the local authorities through land use plans, several local authorities jointly or the federal states by means of the regional plan.

The proposal is based on:

Agora Energiewende/Reiner Lemoine Institut (2021): *Der Windflächenrechner – ein Beitrag zur Diskussion um die Ausweisung von Flächen für Windenergieanlagen*

Kment, Martin (2020): *Sachdienliche Änderungen des Baugesetzbuchs zur Förderung von*

Flächenausweisungen für Windenergieanlagen. Legal opinion on behalf of the Stiftung Klimaneutralität

Stiftung Klimaneutralität (2021): *Wie kann die Verfügbarkeit von Flächen für die Windenergie an Land schnell und rechtssicher erhöht werden?* Regulation proposal

11 Reconcile species conservation and climate change mitigation

In order to resolve the conflict of objectives between climate change mitigation and species conservation for the expansion of wind energy, the Federal Nature Conservation Act (Bundesnaturschutzgesetz) will define safety distances to breeding sites for all relevant bird species: these will then define where turbines are permitted, where they are permitted with measures and where they are prohibited. The safety distances ensure that the expansion of wind energy will not endanger the bird populations. As the conservation status of many bird species is under pressure from a large number of other factors, the Federal Government and federal states will start a programme under the Joint Task for the *Improvement of Agricultural Structures and Coastal Protection (GAK)* with an annual budget of at least EUR 100 million.

Background:

Expansion of onshore wind energy has slumped massively over the last three years. Besides the shortage of available sites and excessively long approval procedures, one of the major reasons for this collapse is the unsolved conflict of interests with species conservation. Disputes increasingly end up in court: so far there has been no success in harmonizing climate change mitigation and species conservation. All European Union member states are bound by the Birds Directive and the ban on killing established there. However, the current provisions do not create the necessary legal clarity for all those

involved. The requirements of species conservation are checked in individual cases and the federal states have numerous comprehensive guides to this. Despite years of work within the Conference of Environmental Ministers, there has been no success in unifying the standards.

Regulation proposal:

In order to simplify and accelerate the approval of wind turbines, an exception will be regulated under species protection law, taking account of the provisions of Article 9 of the Birds Directive. This exception will be for a limited period until climate neutrality is achieved. It is justified on the basis of the importance of onshore wind energy for climate change mitigation, the security of supply and therefore public security in Germany. The exception from the species protection killing ban will be clearly limited through safety distances to documented nesting places so that it does not cause declines in bird species populations.

For bird species at risk of collisions, the Federal Nature Conservation Act defines a species-specific lower safety distance, below which wind turbines are not permissible under species protection law. There is also a species-specific upper safety distance. Species protection law permits wind turbines in the area between the lower and upper safety distances, provided that clearly defined measures are adhered to (for example, anti-collision systems). Outside the upper safety distance wind turbines are always permitted under species protection law. The Federal Government and federal states monitor the conservation status of the relevant bird species in Germany at regular intervals. Considering that the conservation status of many species of birds is under pressure due to a range of other factors, the Federal Government and federal states will set up a protection program for bird species sensitive to wind power, for instance under the GAK, with an annual budget of at least EUR 100 million.

Explanation:

En route to climate neutrality, we can no longer afford the current legal uncertainties and resulting delays to the expansion of wind energy. A clear and conclusive legal framework is required that constructively resolves the conflict of interests between climate protection and species conservation for wind turbine approval and serves both interests. In future all those involved need clarity over the sites at which wind turbines are either permitted, permitted with measures or not permitted under species protection law. This will considerably speed up the approval procedures.

The regulation is compatible with European law. Suitable measures will be used to ensure that the objectives of the Birds Directive are not undermined. According to the provisions of the constitution, the Federal legislator is authorized to make a regulation that applies throughout Germany. Under the constitution, the federal states have no right to deviate from Federal law in matters of species protection law.

The proposal is based on:

Reichenbach, Marc/Aussieker, Tim (2021):

Windenergie und der Erhalt der Vogelbestände – Regelungsvorschläge im Kontext einer gesetzlichen Pauschalausnahme. Expert opinion from the Arbeitsgruppe für regionale Struktur- und Umweltforschung GmbH (ARSU) on behalf of the Stiftung Klimaneutralität

Scharfenstein, Clara/Bringewat, Jörn (2021): *Welche Möglichkeiten bietet das europäische Artenschutzrecht, das deutsche Artenschutzrecht zur Verbesserung der Zulassungsfähigkeit von Windenergieanlagen anzupassen?* Legal opinion from the law firm von Bredow Valentin Herz on behalf of the Stiftung Klimaneutralität

Stiftung Klimaneutralität (2021): *Klimaschutz und Artenschutz – Wie der Zielkonflikt beim Ausbau der Windenergie konstruktiv aufgelöst werden kann*

12 Accelerate approval procedures, define upper minimum distances and simplify repowering

The approval procedures will be redrafted in an on-shore wind energy act. The maximum processing time after the application has been deemed to be complete will be limited to 10 weeks without public consultation and 22 weeks with. If no decision is issued within the deadline, the application will count as approved. While maintaining the environmental standards, the threshold for formal environmental impact assessments for wind parks will be increased from three to seven turbines. The upper minimum distances of wind turbines to residential areas (Section 249, BauGB) will be uniformly set for all federal states to three times the turbine height (3H) and for the renewed use of existing sites (repowering) to 2H.

Background:

Expansion of onshore wind energy has slumped massively over the last three years. Besides the shortage of available land and the unresolved conflict of interests with species conservation, the long approval procedures are a major reason for the collapse. The length of the procedure also often means that applications made for specific types of turbines have to be completely rewritten if the turbines applied for are no longer available or the applicant wishes to switch to more modern turbines. In addition, restrictive distance regulations to residential areas in the federal states constrain the process of identifying land. Without a fundamental reform of the approval legislation with a significant acceleration of the approval procedures, neither the expansion targets for wind energy nor the climate goals will be achieved.

Regulation proposal:

The approval procedures will be removed from the Federal Immission Control Act (Bundesimmissionsschutzgesetz) and transferred to an approval regime adapted to the particular technological features of onshore wind energy (Onshore Wind Energy Act – Windenergie-an-Land-Gesetz). In future applications must be decided within a period of ten weeks from completion of the documentation. Procedures with public consultation must be decided within 22 weeks. If the authorities have not approved or rejected the application by the deadline, then it counts as approved (constructive approval). The approval authorities must inform the applicant of the completeness of the documentation within a period of six weeks. The approval procedures including public consultation will be carried out online. The upper minimum distances of wind turbines to residential areas (Section 249, BauGB) will be uniformly set for all federal states to three times the turbine height (3H) and for the renewed use of existing sites (repowering) to 2H. The replacement of turbines at existing sites is always permitted under species protection law.

Explanation:

An approval regime specifically designed for onshore wind energy will make appropriate allowance for the special features of this technology. The stipulated deadlines will tighten up the timing and ensure greater legal and procedural security without reducing the material requirements of environmental protection or other public interests. The constructive approval will effectively limit the duration of the approval process. This will also significantly ease the repowering process. Changing the approval process to purely online documentation and workflows makes it simpler and quicker and reduces the likelihood of errors.

The proposal is based on:

Stiftung Klimaneutralität und Bringewat, Jörn/Scharfenstein, Clara (2021): *Entwurf für ein Windenergie-an-Land-Gesetz*. A proposal by the Stiftung Klimaneutralität, with the technical detail prepared by the law firm von Bredow Valentin Herz

13 Promote offshore wind energy

The land-use development plans for the German exclusive economic zone (EEZ) and the site development plans for offshore wind energy will be adapted to the new long-term expansion targets for achieving climate neutrality. (2030: 25 GW, 2035: 40 GW, 2040: 60 GW, 2045: 70 GW). In the case of competition for space, wind energy will be given priority as it is an essential requirement for climate neutrality.

Background:

Offshore wind energy is characterized by relatively high public acceptance and attractive electricity costs. It has already become an important pillar of the maritime economy in Germany and Europe. Its expansion requires sufficient available areas in the North and Baltic Seas. These need to be identified and developed in good time due to the very long planning processes. The target of climate neutrality requires offshore wind energy amounting to 25 GW in 2030, 40 GW in 2035, 60 GW in 2040 and 70 GW in 2045.

Regulation proposal:

The Federal Regional Planning Act (Raumordnungsgesetz) establishes the use of offshore wind energy as a measure for climate protection. In compiling and revising the land-use development plans for the EEZ, the exploitation of wind energy is given priority. Priority and restricted areas need to be identified that will be sufficient for 70 GW offshore

generation in the long-term. Revision of the area development plans must identify areas in time and space that ensure that interim targets are reached and the necessary infrastructure links installed in good time. Joint use with other interest areas will be expanded (co-use).

Explanation:

Regional land-use planning will set specific goals and principles in the regional plans for areas in the EEZ and identify appropriate priority and restricted areas. For the site development plan (Flächenentwicklungsplan FEP), in accordance with the Offshore Wind Energy Act, the targets set in the regional plan for the EEZ are generally binding and the basic principles must be included.

The priority and restricted areas identified so far are not adequate for reaching the targets. In order to make the necessary areas available for expansion, the land-use development plans for the German EEZ must be modified accordingly. Following this, the site development plans must be adequately defined in time and space for the preliminary examination of areas, to enable tendering, construction and connection of the generation capacity to be carried out in good time.

The proposal is based on:

Prognos/Öko-Institut/Wuppertal Institut (2021):

Klimaneutrales Deutschland 2045. Study on behalf of Stiftung Klimaneutralität, Agora Energiewende and Agora Verkehrswende

14 Expand ground-mounted solar PV parks

The sites for subsidized and non-subsidized ground-mounted PV parks will be decided in future solely by local authorities through their development plans: all regulations on eligible areas in the

Renewable Energy Sources Act will be abolished. Size limitations are also no longer applicable. Similar to wind energy, payments will also be introduced to local authorities for ground-mounted PV parks. Agricultural PV will be expanded.

Background:

Alongside wind energy, photovoltaics is the most important energy source for achieving climate neutrality. The required installed photovoltaic capacity will rise to 150 GW by 2030 and 385 GW by 2045. In order to achieve half of the necessary gross expansion in photovoltaics by 2030 via ground-mounted PV under the Renewable Energy Sources Act, the tendered quantity must be increased to at least 5 GW per year. Ground-mounted PV is of major importance for achieving the targets. It is the cheapest form of PV generation and can be ramped up quickly. Experience with wind energy shows that proactively ensuring acceptance is essential for achieving consistently high expansion rates.

Regulation proposal:

The restrictions for land access for ground-mounted PV and the size limitations will be removed from the Renewable Energy Sources Act. Local authorities will therefore have sole responsibility for deciding the location and size of all solar plants.

A special levy will be introduced, to be paid by the operator of the ground-mounted PV plant (GMPV plants) to the local authority/ies. A tendering category will be created for agricultural PV with a tendered quantity rising to 400 MW in 2025. Regulations for agricultural subsidies will be adjusted so that agricultural use in combination with agri-PV will not be at a disadvantage. A separate support structure will be introduced for peatland PV plants that conserve or rewet peatlands.

Explanation:

The EEG contains a series of regulations that link the entitlement to payment for ground-mounted solar plants to specific types of land, plus a maximum size of 20 MW. The proposed revision will remove these general restrictions and enable an accelerated expansion. The regulation will therefore treat GMPV plants in the EEG equally to plants in Power Purchase Agreements. The decision on location and size remains completely in the hands of local authorities via development planning. In addition, federal states can control the eligible areas for expansion through the regional plan if needed.

The introduction of a special municipal levy will improve the required acceptance locally on a permanent basis. Agri-PV enables the combination of agriculture and energy generation. This improves acceptance and can be cost-effective in the long term. A separate tendering segment will enable technology to be applied in practice and cost reduction potentials to be increased. In order to prevent financial penalties, the agricultural subsidies need to be adjusted so that a double use of the land does not result in a loss of agricultural subsidy. Particular attention needs to be paid in this context to peatland PV plants as they provide a double climate protection effect: conservation and rewetting of peatland stores CO₂ in the soil while solar plants generate zero carbon electricity.

The proposal is based on, for example:

Agora Energiewende (2018): *Wie weiter mit dem Ausbau der Windenergie?* Two strategy proposals to ensure site acceptance of onshore wind energy

15 Encourage prosumers

The rules for prosumers (for example, buildings with PV panels, heat pumps, electric cars and storage) will

be radically simplified. Regulations for grid connection will be unified throughout Germany.

Background:

Half of the PV expansion by 2030 of around 100 GW can be achieved through PV panels on roofs. Residential buildings in particular offer considerable potential – PV electricity can be directly used locally and also fed into the grid (what is known as prosuming). Residential buildings are also crucial for reaching the targets in the heating and mobility sectors: most heat pumps supply residential buildings. Charging points for electric vehicles in and on residential buildings are indispensable. There is also major potential in the commercial sector, particularly for large-scale roof-top installation.

Current framework conditions for prosumers are highly complex and generally hinder expansion. The high price of electricity for the end customer with invariable tariffs, fees and taxes makes home consumption excessively attractive while it is unattractive to feed into the grid due to low EEG payments. Roof potential is therefore not fully exploited and battery banks are more economically attractive to prosumers than their intrinsic value. Current regulations for landlord-to-tenant electricity are also very unattractive and the planned expansion quantities have not materialized.

Regulation proposal:

The regulations for prosumers will be radically simplified. The technical connection requirements will be uniformly regulated and simplified throughout Germany, with all regulations being carefully checked for their suitability for use in relatively small photovoltaic systems. The proviso will be that a small PV system may not be more complicated to connect than a heat pump. Regulations will also ensure that the costs for electricity purchase from the

grid and payments for feeding into the grid will be independent of the use or source of the electricity. The current funding for electricity fed in from roof-mounted PV systems will be reviewed and will be implemented in future as an investment grant, at least in the small roof sector. Levies, fees and taxes will be changed so that electricity is particularly cheap when large amounts of RE electricity are available locally and bottlenecks in the distribution network are reflected in the price. Conditions for landlord-to-tenant electricity will be simplified and revised to make it attractive to cover the roofs of rental housing completely with PV panels.

Explanation:

Framework conditions for prosumers must be as simple as possible and be able to be understood by laypersons. It is currently very challenging for experts and practically impossible for non-experts to have an overview of the entire regulatory framework. This causes problems when the regulations change as interactions are not easy to identify. In addition, regulations that were originally developed for large power plants and commercial electricity providers are being applied to small systems. In this situation specific changes to legal standards are not helpful and what is needed is a nationally unified and simple regulation of the connection requirements as well as the prosumer and landlord-to-tenant electricity regulations.

One major reason for the high degree of complexity is the privileged treatment of particular forms of generation and consumption. This point is addressed by the requirement for a unified treatment of quantities of electricity. As funding per kilowatt hour is a major reason for the limitation of electricity quantities, this requirement can be much better achieved if it is applied as an investment grant. The possibility of a KWh payment for full feed-in is unaffected. Intelligent control and dynamic price signals are necessary in order to reach a coordinated operation of

the various components that benefit the system (storage, e-mobility, heat pumps), particularly with the aim of limiting the required expansion of the grid to an efficient level. This can be achieved via a suitable reform of the levies, fees, charges and taxes.

16 Introduce PV obligation

A duty to install solar panels will be introduced for new buildings and roof renovations.

Background:

PV roof panels enjoy a very high level of acceptance and produce very little conflict with environmental and nature conservation.

At the same time, it can be noted that there are still many buildings with no PV panels. Surveys for the new build sector for 2018 show that PV panels were only installed on seven per cent of new buildings. Voluntary installation of PV panels therefore remains essentially limited to the initiative of owners. The Buildings Energy Act (Gebäudeenergiegesetz, GEG) contains regulations that aim to provide buildings with renewable energy. However, increasing the share of renewable energies in the public electricity supply is not one of the aims of the GEG so far.

The result is that large parts of the PV potential on roofs remains unused. This puts the achievement of the climate protection targets at risk and is a missed opportunity for local value creation.

Regulation proposal:

In future there will be an obligation to install a photovoltaic system of appropriate minimum size on all new buildings and for roofs undergoing significant renovation. This applies to both residential and commercial buildings.

It will be ensured that the cost for meeting the obligation is within limits and that the cost effectiveness of the investment is guaranteed. This requires a simplification and standardization of the processes for grid connection, the removal of tax restrictions on the operation of PV systems, and minimal administrative requirements.

Explanation:

At regional level, some federal states have already adopted a photovoltaic obligation or are aiming for this (for example, Bavaria, Baden-Württemberg, Berlin, Bremen, Hamburg, Lower Saxony and Schleswig-Holstein). This illustrates the basic proportionality of the instrument. A national regulation simplifies the application under regional law and creates additional clarity and equal conditions across the whole of Germany.

The expansion of PV should be carried out on roofs particularly because there are no competing uses for the same surface. At the same time, experience over the past few decades shows that photovoltaics are only installed on a very small proportion of new buildings and renovation projects – although this is cost-effective. A solar obligation is therefore a suitable instrument for exploiting the otherwise unused area on roofs for the energy transition.

17 Adapt network expansion to climate goals

Transmission grid planning will be quickly adapted to the new climate goals.

Background:

In order to achieve climate neutrality, electricity generation must be converted completely to renewable energies by 2045 at the latest. The large-scale electrification required will lead to an approximate

doubling of the electricity demand, despite considerable increases in efficiency. At the same time the share of decentralized generation technologies in the distribution networks is increasing and sector coupling increases the interaction with heat and hydrogen networks. These in part fundamental changes have not been adequately taken into account in the design of the network to date. There is not only a lack of planning for a long-term target network for a 100 per cent renewable electricity supply, but also no consistent interlocking with gas network planning in terms of an integrated system development plan.

Regulation proposal:

Planning the electricity and gas networks will be better integrated through a newly created system development plan. Electricity network planning must be aimed without delay at the goal of climate neutrality in 2045 and a completely renewable power supply. As an emergency measure, the networks in the current electricity network development plan (NDP) identified as necessary for 2035 must be codified in an amendment to the Federal Requirements Plan Act (Bundesbedarfsplangesetz, BBPlG). In order to avoid predictable cost-intensive and time-consuming extension and conversion works, the expansion of the planned high-voltage, direct current (HVDC) electric power transmission system must be resolved quickly and decisively.

Explanation:

Network planning for long-term needs is essential in order to cost-effectively implement the necessary expansion in time. The strategy followed so far of making incremental design changes is neither conducive to acceptance nor cost-saving. In addition, better planning coordination across sectors is required in order to enable a needs-based infrastructure.

Action is also needed in the short term: the anticipated further demand for north-south HVDC transmission lines must not first be identified in the future NDP process as planned nor through the BBPIG revision in 2024, exactly when the previously agreed HVDC transmission project SuedLink (as well as A-Nord and SuedOstLink) are under construction. It is essential that the Federal Network Agency takes the necessary steps under the coalition agreement for an audit of the energy sector requirement under Section 12e, Clause 4 of the German Energy Industry Act (Energiewirtschaftsgesetzes, EnWG) within three months, as well as the priority requirement for SuedLink 3 and 4, in order to create the basis for the expansion of the HVDC transmission project in the Federal Requirements Plan Act.

18 Accelerate energy complaint procedures

Two senates will be set up in the Federal Administrative Court to accelerate proceedings for turbine installation and power line construction. These will deal solely with decisions on energy law.

Background:

The legislator has recognised that the procedures for implementing larger infrastructure measures must be handled more rapidly. The Investment Acceleration Act (Gesetz zur Beschleunigung von Investitionen) of 3 December 2020 and the Act Amending the Federal Requirements Plan Act and other Provisions (Gesetz zur Änderung des Bundesbedarfsplangesetzes u. a. V.) of 25 February 2021 are the main instruments in this context. While the first-mentioned law has transferred the first instance jurisdiction for the construction, operation and modification of wind turbines to the higher administrative courts (Oberverwaltungsgerichte, OVG) and has thus shortened the appeal process, the Act Amending the Federal Requirements Plan (Gesetz zur Änderung des Bundesbedarfsplangesetzes) has incorporated 35 new

national network expansion projects linked to the energy transition into the legislative programme. At the same time, besides the simplification of planning permission, both the first and final instance jurisdiction have been assigned to the Federal Administrative Court (Bundesverwaltungsgericht, BVerwG). In these cases, the BVerwG makes the final decision so that a prolonged legal process is avoided and the procedure can be dealt with more rapidly. The changes reduce the administrative court instances, but they considerably increase the workload for the OVG and, in particular, for the Federal Administrative Court.

Regulation proposal:

In order to take account of the extra workload for the higher Administrative Court and the Federal Administrative Court that have to act as both the first and second instance, two additional senates will be created for the Federal Administrative Court that deal solely with complaint procedures under energy law. This is the only way in which suitable provision can be made for the fundamental procedural rights to granting effective legal protection (Section 19 (4)1 German Constitution) in the area of energy law.

Explanation:

According to established case law, the state must endow the judiciary so that the pending procedures can be processed and decided without avoidable delays, with due dispatch and in reasonable time. However, the predictable increase in workload for the higher administrative courts and the Federal Administrative Court creates the danger that, because of the existing workload, the Federal Administrative Court will in future become a bottleneck for complaint procedures. In view of the increased demands for the energy transition, the constitutionally protected entitlement to the granting of effective legal protection can only be met through additional senates focused solely on energy law.

19 Decarbonize district heating

The use of district and local heating will be increased by 50 per cent to over eight million connected households by 2030. The share of climate-friendly heat generation will be doubled through the increased use of large-scale heat pumps, solar thermal energy, geothermal energy, industrial waste heat and green hydrogen. The expansion of district heating and its decarbonization will be funded to the sum of EUR 1.5 billion per annum. A price regulation will be introduced due to the monopoly position of district heating network operators.

Background:

The expansion of collective heating networks is a key element in reducing final energy consumption in the building stock. Heating networks enable socially acceptable transport of environmentally friendly heat in densely populated urban areas where individual zero carbon heating solutions reach their limits. They also present an economical option for using electricity from renewable energies flexibly over time and allow the use of waste heat from industry, waste incineration and geothermal energy. However, the Directive on the General Conditions for the Supply of District Heating (Verordnung über Allgemeine Bedingungen für die Versorgung mit Fernwärme, AVBFernwärmeV) has remained practically unchanged since the 1980s. The provisions of the German Energy Act (Energiewirtschaftsgesetz, EnWG) and the Basic Supply Ordinances for Power (Grundversorgungsverordnungen für Strom, StromGVV) and Gas (GasGVV) were not taken up, which is why there are no guidelines for the development and nature of the networks, for heat generation or for price formation. These need to be formulated before the district heating share of final energy consumption in residential buildings can be increased to 16 per cent by 2030 (26 per cent by 2045) and in the non-residential building sector to 14 per cent by 2030 (32 per cent by 2045).

Regulation proposal:

The Federal Government will agree an expansion target for district and local heating where the share of living space heated by district heating will increase by almost 50 per cent by 2030 to over eight million household connections, and by almost 140 per cent by 2050. The minimum percentages of renewable energies and waste heat in heating networks will be regulated and the use of biomass limited to 20 per cent. Heating providers will be obliged to develop and implement strategic network transformation plans. Requirements for the methodology to be used, for inspecting and approving the plans and for monitoring the measures need to be controlled by means of a regulation. The division of network and operations and the opening up of the networks contribute to accessing alternative and renewable heat sources, particularly if the operators of heat generated in an environmentally friendly way receive priority for network connection as well as for the purchase and payment of their heat from the network operator.

The expansion of heating networks and their decarbonization, particularly in urban areas, will be funded to the sum of EUR 1.5 billion per annum. A competitive tendering model (funded volume EUR 200 million per auction) with several targeted tranches (for example network connection) will be introduced. To avoid significant increases in electricity prices, funding will come from outside the Combined Heat and Power Act (Kraft-Wärme-Kopplungsgesetz, KWKG). The fossil KWK payment will be redirected into climate-neutral fuels. Monitoring abuses and independent price control will be introduced to ensure that the pricing strategy is socially acceptable.

Explanation:

Local and district heating networks offer great potential for decarbonizing the building stock if the

statutory, institutional and administrative conditions are created for effective regulation of the district heating network operators. A regulatory safeguarding of the expansion of renewable energies in district heating, particularly through a minimum share for renewable energies and waste heat, combined with adequate funding rates to secure their rapid growth will support the socially and environmentally compatible extension and conversion of the collective network infrastructure while at the same time strengthening competition.

Removing the funding from the KWKG will prevent any significant increase in the electricity price. Instruments such as government price regulation and transparency obligations for the district heating providers (for example for the environmental quality of the district heating) guarantee public acceptance of the energy carrier district heating, particularly if building owners are obliged to purchase it.

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

20 Ensure security of supply

The security of supply will be ensured through the existing electricity market design, the reserves and continuous monitoring by the Federal Network Agency. All new gas-fired power plants must be hydrogen-ready so that in future the fuel can be converted from natural gas to hydrogen.

Background:

In the course of phasing out coal, there will be a need for an additional 20 GW of gas capacity by 2030 in order to guarantee security of supply. The current electricity market design is planned so that these new capacities can be added to the market. There will also be several reserves available to ensure security of supply. The volume of these will be constantly monitored and adjusted by the Federal Network Agency. In future this will also be guaranteed under the European internal electricity market, as clarified by an expert report by Prognos AG that studied the conversion of electricity generation in line with the climate goal of at least minus 65 per cent greenhouse gas emissions by 2030.

Regulation proposal:

There is currently no requirement for any changes to the design of the electricity market: electricity providers will continue to only be able to sell electricity that they are certain of being able to buy on the electricity markets. Due to the obligation to the balancing zones combined with very high penalties, there is an effective incentive to guarantee capacities. This triggers the necessary investments in new gas power plants. Added to this is the subsidized expansion of new gas CHP plants required by the CHP law.

In order that all new power plants will be able to produce electricity on the basis of hydrogen from 2040, the provisions in the Federal Immission Control Act and the Cogeneration Act (KWKG-Gesetz) will be amended so that funding of CHP plants and approvals for new power plants will only take place if the plant can technically also use hydrogen as a fuel.

Explanation:

Bringing the phase-out of coal forward to 2030 at the latest creates a more urgent need for action,

particularly in the field of cogeneration for district heating. Existing instruments to guarantee the supply safeguard the system from generation bottlenecks. The electricity market design produces economically effective incentives for remaining loyal to the balancing zone, in other words, in the case of a shortfall, suppliers are subject to very high costs and therefore have a sufficiently high willingness to pay, including for funding new investments.

However, there is a risk of bad investments if newly built power plants are not compatible with complete climate neutrality. At the same time, renewable hydrogen is in short supply for the present and is comparatively expensive, so that starting electricity production from hydrogen now in all new power plants would be neither practical nor economically efficient. Specifying hydrogen compatibility therefore avoids any potential stranded assets.

The proposal is based on:

Prognos (2021): *Klimaneutralität und Versorgungssicherheit im Strommarkt: Bewertung der Versorgungssicherheit bis zum Jahr 2030 der Szenarien KN2050 und KN2045 aus der Studie „Klimaneutrales Deutschland. Study on behalf of Stiftung Klimaneutralität*

21 Introduce Carbon Contracts for Difference

In order to finance climate-neutral technologies in the raw materials industry, climate change mitigation contracts in the form of Carbon Contracts for Difference (CCfDs) will be introduced by law. These will fund the cost differences between the climate-neutral technology and the proceeds which could be generated on the market. Refinancing the Carbon Contracts for Difference will be permanently ensured via a suitable instrument.

Background:

Massive reinvestments are due in the energy-intensive industries by 2030. In order to reach the climate goals in the industrial sector, these reinvestments must be used to introduce climate-neutral key technologies and to prevent an extension to the service life of large CO₂-intensive plants. However, the use of new technologies is often not cost-effective nowadays due to high acquisition and operating costs, as their production costs lie significantly above those of traditional reference plants. The CO₂ reduction costs for most technologies are considerably above EUR 100 per tonne CO₂ and therefore far above the CO₂ price in the EU ETS.

This dilemma can be resolved by introducing project-specific climate protection contracts (Carbon Contracts for Difference). Carbon Contracts for Difference are project-related contracts between a company and the public authorities, which guarantee the company a payment for achieving emission reductions in order to enable the procurement and operation of environmentally friendly key technologies. As part of the national hydrogen strategy, the Ministry of the Environment, Nature Conservation and Nuclear Safety is currently developing a pilot project for carbon contracts for difference. Climate Contracts are planned as an instrument to cover the additional operational costs where a cumulation with investment funding programs will be aimed for.

Regulation proposal:

Within the first half of the next legislative period, a national legal framework will be created for the broad application of climate contracts. The pilot program by the Ministry of the Environment, Nature Conservation and Nuclear Safety currently under development will be transferred to this new legal framework. The award of climate contracts will be gradually developed into a model of cross-sector tenders. Initially, each sector will have a two-stage

award procedure with competitive elements like a tender. The medium-term aim is to organize the award of climate contracts via cross-sector tenders and to transfer the instrument to an EU-wide mechanism.

The term and design of the climate contracts will be based on the economic efficiency of the different plants. The legal framework will determine how capital costs (CapEx) and operating costs (OpEx) can each be funded efficiently. Climate contracts will be designed in such a way that they can be quickly incorporated in the existing regulatory framework but at the same time are compatible with the anticipated reforms of the EU ETS, such as an adjustment of the free allocations or the introduction of a Carbon Border Adjustment Mechanism (CBAM). The annual funding level will be dynamically adjusted so as to reflect varying operating costs and falling technology costs. The incentive effect of the climate contracts on the manufacture and supply of climate-neutral hydrogen in particular must be adequately reflected. Compatibility of the legal framework with the EU State Aid law will be ensured.

Refinancing the climate contracts will be permanently guaranteed. The options are a third value added tax rate on the various end products, a climate fee on the domestic consumption of these end products or legally secured budget financing.

Explanation:

The introduction of key technologies will enable the widespread application of climate-neutral key technologies in industry that have no business case in the current market environment. Climate contracts will supplement existing funding instruments, in particular funding programs to finance the capital costs of climate-neutral technologies.

Two versions of the design for CCfD are particularly suitable: CCfD that balance the cost difference on the

product side of the transformative production process and CCfD that apply to the input side. The latter focus on the operating costs and balance the cost difference for the use of climate-neutral hydrogen compared to the other materials used, such as natural gas. The availability of proof of origin is a key requirement, so that the reference costs to be applied can be clearly identified. These CCfD will be supplemented by investment funding for plant investments in transformative technologies, for example for direct reduction plants in the steel industry.

For product-related CCfD, the basic suitability of individual technologies for funding via climate contracts should be made dependent on various criteria. These include the availability and level of maturity of the technology, synergy with the development of the necessary infrastructure and the energy transition in general, the level of the CO₂ saving potential and CO₂ reduction costs as well as interactions with existing funding instruments and regulations for specific technologies. Funding through climate contracts is suitable for such sectors as steel manufacture based on direct iron reduction with renewable hydrogen via a start with natural gas and CCS-based hydrogen if necessary, the use of renewable hydrogen to manufacture ammonia as well as the use of CO₂ capture based on the oxyfuel process for cement production plants. Besides the above-named processes for the direct avoidance of CO₂, climate contracts can also be used to fund electrification of large industrial plants, such as steam crackers and other technologies.

In relation to financing the additional operational costs, the often long duration of climate contracts demands financial planning security – irrespective of economic trends and legislative periods. A permanent guarantee of the refinancing of the climate contracts is therefore key. Besides funding via the general national budget, two polluter pays options are possible: a climate surcharge on selected materials and their products (steel, plastic, aluminum and cement) or a third, higher value added tax rate on these

products. It is always important that, for competitive reasons, the consumption of the materials should be used for refinancing – irrespective of whether the products were produced at home or were imported. The additional costs for the end consumers would be minor in comparison to the product: a climate surcharge for steel of EUR 100 per ton would increase the price of a small passenger car with a ton of steel by EUR 100 (< 1 per cent).

The proposal is based on:

Agora Energiewende, FutureCamp, Wuppertal Institut und Ecologic (2021, i. E.): *Klimaschutzverträge für die Industrietransformation*

Matthes, Felix Chr./Braungardt, Sibylle et al. (2021): *Die Wasserstoffstrategie 2.0 für Deutschland*. Study by the Öko-Institut on behalf of the Stiftung Klimaneutralität

22 Promote investment through accelerated depreciation

Investment in climate change mitigation and high-efficiency technologies in industry will be promoted through investment grants and accelerated depreciation.

Background:

Significantly improved energy efficiency and the replacement of fossil energy carriers by renewable electricity are important levers for reaching the climate goals in the industrial sector. However, the track record over the last few years is not very promising: energy consumption by industry has risen by over ten per cent since the year 2000. In addition, gross capital investment in Germany has been growing more slowly than economic output for years. Existing industrial plant is getting progressively older. There is therefore a need to provide

incentives for investments in particularly efficient and flexible technologies.

Regulation proposal:

The "Federal Funding for Energy Efficiency in the Economy – subsidies and loans" will be increased to EUR 500 million per year and the continued over a longer period. High-efficiency cross-cutting technologies will receive targeted funding. The "Federal Funding for Energy Efficiency in the Economy – funding competition" will be tripled. The tax writing down deadlines on climate-neutral efficiency investments will be shortened by five years as long as these reduce specific CO₂ emissions by more than 20 per cent or reduce specific energy use by 15 per cent. The reduction also applies if the measure replaces fossil fuels by electricity or waste heat, or if the electricity demand becomes more flexible, thus benefiting the system.

Explanation:

Existing funding programs such as the "Federal Funding for Energy Efficiency in the Economy – funding competition" are often significantly oversubscribed. The program therefore needs extra funding. Retrofitting and high-efficiency cross-cutting technologies such as pumps, fans and compressors as well as the switch to renewable process heat will permanently strengthen Germany as a business location. Accelerated depreciation is a proven means of stimulating investments quickly and effectively. The link to clear criteria and guidelines ensures that knock-on effects are minimized and investments are fully compatible with the goal of climate neutrality.

23 Reform network charges

The electricity network charges will be reformed in such a way as to provide incentives to industry for large scale heat pumps, Power-to-Heat and flexible load management.

Background:

Raising flexibility in the industrial electricity demand is an important contribution for integrating higher amounts of wind energy and PV electricity in the system. This applies in particular to the economically efficient use of production peaks, for example for heat generation (Power-to-Heat). Electricity must be used when it suits the system. Network availability and network charges play a correspondingly important role.

However, the current design of the network charge system is mainly directed at inflexible consumption: the purchase of constant capacity is rewarded and flexibility penalized. The resulting distortions are so great that orientation of consumption to the wholesale electricity prices – and therefore the supply of RE – is almost completely eliminated. These regulations stand in the way of industrial companies who want to switch to greater electrification. Similar difficulties exist in relation to the private development of a public charging infrastructure. Due to low exploitation (particularly during start-up), high charging capacities result in high network charges, which ruin every business case.

Regulation proposal:

Network charges will be fundamentally reformed. Besides clarifying the basic question of which group of customers (including within industrial consumers) have to bear which network costs, the tariff structure must be transformed so that it creates incentives for flexible behavior that supports the

system: grid-relieving electricity purchase when RE generation is higher must become cheaper. Users' contributions to network costs will be represented less through annual demand prices and more by the unit prices that reflect a variable use of the distribution grid over time. Energy-intensive industrial businesses need internationally competitive electricity prices.

Explanation:

Network costs are currently collected via a consumption-related component (unit price) and according to the annual consumption peaks (demand price). The larger the electricity consumption, the more dominant the demand prices become. Including the exemptions means it is not economically attractive for the industry to operate (new) consumption equipment flexibly. The occurrence of network bottlenecks and the need for expansion, their location and extent, is nowadays completely unconnected to pricing – meaning that the connection only exists via all the network customers without regard to the location and actual use over time.

The regulations are currently such that it can be economically disadvantageous to exploit industrial plant capacity in line with wholesale electricity prices, although this would make sense in terms of the whole system. A particular obstacle is the regulations for the network charge discounts (for example, the 7,000 hour threshold). A reform of the network charging structure will make a corresponding contribution to removing the obstacles to a flexible electricity use and at the same time support integration of renewable energies in a cost-efficient manner.

24 Develop a circular economy strategy

A national circular economy strategy will be developed that reduces CO₂-intensive primary production

of raw materials as well as waste incineration and closes resource and carbon cycles.

AND

25 Introduce product-specific sustainability criteria

By introducing product-specific sustainability criteria and requirements for product design and recyclability, product downcycling and greenhouse gas emissions will be reduced. Digital marking on materials and products will make sustainability characteristics comparable and transparent.

Background:

Materials management causes around 50 per cent of global greenhouse gas emissions. A significant part of these emissions and the raw material requirement can be avoided by using materials more efficiently and closing material flows as far as possible as part of a circular economy. In CO₂-intensive raw materials industries (cement, steel, plastics and aluminum), greenhouse gas emissions can be reduced by this means by an estimated 40 per cent.

The European Commission underlines the importance of the circular economy in the European Green Deal and the new Circular Economy Action Plan: before the end of 2021 the area of application of the Ecodesign Directive is due to be expanded beyond products of relevance for energy consumption. Germany has had a Circular Economy Act (Kreislaufwirtschaftsgesetz) since 2012 that was only revised at the end of 2020. However, its main purpose is to control the disposal of wastes. Germany first produced guidelines for conserving natural resources in 2012 with the German Resource Efficiency Program (Deutsches Ressourceneffizienzprogramm, ProgRess). The second revision of this program, ProgRess III, was passed by the Federal

cabinet in 2020, but the package of measures is vague in many places. Despite important progress in the last few years, a comprehensive strategy and specific measures for developing a resource-efficient circular economy are lacking.

Regulation proposal:

A comprehensive circular economy strategy will be submitted by 2023. This will create a framework for action for the accelerated development of a resource-efficient circular economy, and priorities and implementation measures will be defined for the next few years.

The recycling and reuse of raw materials, for example steel, plastics and cement, will be simplified via recycling regulations. The scope of the Ecodesign Directive will be extended and in future will cover products of the CO₂-intensive raw materials industries. Requirements for product design, material efficiency and recyclability will be increased. Higher recycling quotas of raw materials will be enabled through the regulatory inclusion of new processes such as chemical recycling and cement recycling. Regulations and standards will be thoroughly reviewed in order to increase the recirculation of building materials as well as material efficiency and substitution. Landfill bans or fees will be applied to specific material streams.

A digital product pass with standardized product and sustainability information will be established for as many products as possible.

Explanation:

Product design at present pays scarcely any attention to the material use after the product's end of life, something that severely limits recycling and reuse of building components. Product-specific provisions for recyclability and reusability of

materials/products are therefore required. This will enable material cycles to be closed and CO₂-intensive primary production reduced. One of the greatest challenges for recirculation is the poor quality and availability of product and sustainability data, for example on the recyclability and CO₂-intensity of product inputs. A digital product pass that summarizes information on the materials and components used, life cycle emissions, repairability and disposal in a standardized and comparable format can enable actors in the value creation and supply chains to work together towards a circular economy. Digital product passes should therefore be rapidly addressed at European level.

The proposal is based on:

Agora Energiewende und Wuppertal Institut (2020):

Breakthrough Strategies for Climate-Neutral Industry in Europe

26 Create lead markets for green materials

In order to create lead markets for green materials and products, particularly in the construction industry, public sector procurement will be consistently aimed at climate change mitigation and sustainability. This can be complemented by quotas for climate-neutral materials and other demand-side instruments.

Background:

Climate-neutral basic materials will be more expensive than conventionally produced basic materials for the foreseeable future. There is currently still no willingness on international markets to pay these price differences – something that is also due to an inadequate definition of climate-neutral products and the lack of appropriate transparent labelling. Although the government can meet part of the price difference in the short or medium-term through

supply-side instruments thus stimulating production, in the long-term lead markets for green materials and products need to be established. Through the complementary use of demand-side instruments, lead markets can be developed, public expenditure reduced and the introduction of new production methods accelerated.

Public procurement can make an important contribution to this, with an expenditure volume of around EUR 500 billion per year. Public buyers already have to meet environmental requirements in some instances when procuring specific services or products, for example sustainability criteria must be met when buying road vehicles. However, existing provisions are far from adequate in order to achieve a climate-neutral Federal administration by 2030.

Regulation proposal:

As a first step, environmental declarations for selected value chains as well as a standardized evaluation system for comparing the CO₂ content of basic materials will be made mandatory in order to obtain emission data from materials and intermediate products along the value chains. This data will enable the creation of voluntary lead markets for climate-neutral products and value chains. As a second step, policy instruments to create green lead markets at national and European level will be prepared, reviewed and implemented. Options for this are limit values for life cycle emissions of material-intensive end products, quotas for the proportion of climate neutral/recycled materials in end products, and modified building and product standards.

With the aim of a climate-neutral public administration by 2030, procurement by the public administration will be gradually but systematically oriented towards sustainability across all sectors. Sustainability criteria must be complied with for the award of contracts. The relevant laws will be amended as necessary. Priority will be given to the

building (components) and transport sectors. Specific criteria for building materials will be introduced for Federal Government building and infrastructure programs, such as increasing minimum quotas for the use of climate-neutral or recycled materials.

Explanation:

To effectively implement measures for the accelerated development of green lead markets, emission data from materials and intermediate products along the value chains must be available. This can take place as a first step through the obligatory application of environmental declarations for selected value chains as well as the introduction of a standardized evaluation system for comparing the CO₂ content of basic materials. This is particularly important for small and medium-sized enterprises (SMEs) which, without a reliable and standardized label or another information tool, are rarely in a position to carry out detailed market research and to judge whether suppliers deliver the best sustainability performance. Creating appropriate clear labelling is therefore an important first step before policy instruments can deal with the value chain as a whole in a second step. Both proposals should be linked to the introduction of digital product passes (see Item 25).

Mandatory sustainability criteria for public procurement complement the introduction of a CO₂ shadow price for public administration. Even with high shadow prices, the CO₂ cost can be very small as a proportion of total project costs. This is why binding criteria for the award of public contracts is required in order to speed up structural changes.

The proposal is based on, for example:

University of Cambridge Institute of Sustainability Leadership (CISL) und Agora Energiewende (2021): *Tomorrow's markets today: Scaling up demand for climate neutral basic materials and products*

27 Develop a CCS strategy

A strategy will be developed for carbon capture and storage (CCS) which, in cooperation with other European countries, will compensate for the unavoidable residual emissions (maximum 5 per cent) from 2030 and pave the way for negative emissions, so that climate neutrality can be achieved by 2045.

Background:

Climate neutrality requires that unavoidable process emissions, for example in the cement industry, are captured and stored: this will amount to 16 million tons of CO_{2eq} in 2045. Moreover, unavoidable residual emissions that cannot be captured must be compensated. These residual emissions will amount to 63 million tons of CO_{2eq} in 2045, corresponding to five per cent of the 1990 emissions. These result mainly from agriculture (41 million tons CO_{2eq}) and industry (14 million tons CO_{2eq}).

These emissions are compensated using technologies and strategies to achieve negative emissions. This includes the use of bioenergy with carbon capture and storage (BECCS), direct carbon capture from the air followed by storage (DACCS) and carbon storage in long-lasting products.

The annual storage requirement will amount to a total of 73 million tons of CO₂. Dealing with this annual amount in a responsible and environmentally compatible manner requires a long-term well-thought-out approach that is agreed at European level.

Regulation proposal:

A CCS strategy will be developed that, in cooperation with other European countries, will compensate the unavoidable residual emissions (maximum 5 per cent) from 2030.

Developing a European CO₂ infrastructure will be started as soon as possible. Germany supports the inclusion of CO₂ storage sites in the TEN-E Regulation and the rapid development of a European legal framework for CO₂ storage.

Explanation:

In order to enable the capture, transport and long-term storage of the anticipated quantities of emissions, there is a need – in addition to the capture technologies at industrial sites themselves – for a cross-border CO₂ infrastructure, suitable storage capacities and a European legal framework. In particular, to date there are no contracts between the EU and states such as Norway and Great Britain to protect against the long-term risks of storing CO_{2eq} outside the EU. Close cooperation within Europe and a long-term strategy which has broad public support are essential for this.

28 Develop a biomass strategy

A biomass strategy will be developed, based on an analysis of the sustainable biomass potential in Germany, which takes account of competing alternative uses and so regulates the application of bioenergy utilization in industry with CCS (BECCS).

Background:

As an energy carrier and raw material with many uses, biomass has a key role for achieving the climate neutrality goal. Growing various forms of biomass removes CO₂ from the atmosphere which can then be stored in plants, soils and long-lasting products. Amongst the possible future applications are long-term material use through application as a building and insulating material and the manufacture of chemical products, and the use of vegetable charcoal to improve soils in agriculture and forestry,

as well as its use as a fuel with subsequent CO₂ capture and storage (BECCS). The current use as a biofuel will be gradually phased out over the coming years because the transport sector will switch completely to electromobility and ships and aircraft to hydrogen/Power-to-Liquid.

But there are various challenges: the supply of sustainable biomass is severely limited. In addition, sequestration by forested areas in Germany will probably significantly decline in the 2020s, not least due to advancing climate change.

Regulation proposal:

Based on an analysis of the sustainable biomass potential in Germany, a comprehensive strategy for producing, using and funding sustainable biomass will be developed that takes account of competing alternative uses and therefore regulates the application of bioenergy use with CCS (BECCS) in industry.

Explanation:

The current production and utilization of biomass is not compatible with the requirements of climate neutrality. There is therefore a need for a strategy that creates a binding framework for action and identifies measures. This strategy must be based on an analysis of the sustainable biomass potential in Germany and take account of competing alternative uses. It must also address the conflicting interests of land conservation and the energetic and material utilization of biomass, against the background of limited land availability. Former uses of biomass for energy such as biofuels and biogas will be replaced by short-rotation plantations and the application of biomass CCS. There is also a need to define strict sustainability criteria for biomass, otherwise there is no guarantee that the use of large quantities of biomass is not at the cost of nature and species diversity, including in an international context.

29 Increase the stock of electric passenger cars

The necessary instruments will be created to increase the stock of electric cars to at least 14 million by 2030. The motor vehicle tax for newly registered vehicles will be changed so as to develop a clear steering effect towards electric cars through a visible price signal when buying a car. The company car taxation will be reformed in order to remove the negative subsidy effects on the climate due to combustion engine vehicles. At European level, the German Federal Government will support highly ambitious CO₂ fleet emission standards.

Background:

With a share of around two thirds of GHG emissions, passenger vehicle traffic plays a key role for achieving the reduction targets in the transport sector. In order to reach the sectoral target in transport by 2030, at least 14 million electric cars are needed in the vehicle fleet. Current instruments are not sufficient for reaching this target. At national level these include the purchase premium for battery electric vehicles and the tax privileges for the private use of electric company cars. The motor vehicle tax was subject to a CO₂-oriented reform that had little effect. A further reform towards a greater distinction according to CO₂ has been announced by the German Federal Government as part of its "Climate Pact Germany" (Klimapakt Deutschland).

The European CO₂ emission standards are the central supply-side instrument to reduce the average CO₂ emissions of new private and commercial vehicles. In the current version, the reduction targets for passenger cars and light commercial vehicles are 15 per cent by 2025 and 37.5 per cent and 31 per cent respectively by 2030. Under the EU Green Deal, the European Commission has announced that it will bring forward the review of the fleet limit values planned for 2023 and put forward a proposal for a revision by June 2021. The German Federal

Government will play a key role in the subsequent negotiations in the EU Council.

Regulation proposal:

Starting from 2023, vehicle tax will be changed for newly registered vehicles in such a way that it sets a clear and visible price signal for vehicle purchase. The crucial factor for the level of annual tax rate for motor vehicles will be the specific CO₂ emissions (cubic capacity no longer counts). Purely battery electric vehicles with an output of zero grams of CO₂ are exempt from the motor vehicle tax; the current tax exemption deadline of 31 December 2030 will be removed. In combination with degressive sales premiums for low- and zero-emission vehicles, this produces a powerful bonus-malus system that works without additional tax revenues. The financial subsidy for buying a plug-in hybrid vehicle will be stopped or linked to the proof of actual emissions resulting from driving or the electric share of the driving.

Taxation of the private use of service and company cars will be reformed in line with environmental considerations. Existing implicit subsidy effects for combustion passenger cars will be removed. The financial incentives for choosing low-emission vehicles and for low-mileage usage will be increased, both on the business side and that of private users.

In future a distance-based road user charge for private vehicles will be introduced on all roads, which will compensate the falling revenue from the road transport energy tax and create additional funds for expanding the EcoMobility Alliance. At the same time the road user charge provides an incentive for switching to low-emission transport.

As part of the revision of the EU regulation for setting CO₂ emissions standards for new passenger and light commercial vehicles, the German Federal Government is supporting the EU-wide lowering of CO₂

limit values for 2030 of up to minus 75 per cent in comparison to 2021. A further reduction to zero, in other words, phasing out internal combustion engines, will be implemented by 2032 at the latest. The limit value for 2025 will be adjusted in line with the more stringent limit value for 2030. For the period after 2025, efforts will also be made towards introducing an annual reduction trajectory and additional limit values for combustion vehicles. Synthetic fuels will not be counted towards the fleet limit values and a realistic level will be set for the assumptions used in the official test procedure for CO₂ emissions for the electric driving share for plug-in hybrids.

Explanation:

The most recent reform of the motor vehicle tax for new registrations from 2021 can at best be viewed as the start of an effective bonus-malus system. Due to the minor tax increase, it cannot be assumed that any real influence on purchasing decisions will be achieved. In terms of the necessary improvement in efficiency and electrification of the private vehicle fleet, experiences from other European countries show that the demand for electric and high-efficiency passenger cars can be effectively stimulated by applying financial incentives to the purchase of the vehicle.

A significant increase in the passenger car tax for new vehicles, based on the vehicle's CO₂ emissions, can have a noticeable steering effect towards the acquisition of an electric car. The efficiency of passenger vehicles with combustion engines will also be encouraged. Vehicle owners who made their purchase decisions in the past are not affected.

The adaptation of the CO₂ limit values for 2025 and 2030 and a phasing out of combustion engines by 2032 at the latest are required in order to reach the raised climate target for 2030 and the climate neutrality goal for 2045. This requires considerable efforts in the years prior to 2030 in order to put a

rapidly rising share of zero- and low-emission vehicles onto the market. Including fuels with no or low greenhouse gas emissions in vehicle standards could inhibit technical progress with vehicles and lead to a mixing of different statutory regulation levels (vehicles and fuels). In addition, low carbon fuels will remain in short supply in the foreseeable future. They should therefore be used in sectors where no alternatives are available.

The proposal is based on, for example:

Agora Verkehrswende (2021): *Notes on the revision of the EU CO₂ emission performance standards for cars and light commercial vehicles (Regulation (EU) 2019/631)*

Becker Büttner Held (2021): *Europa- und verfassungsrechtliche Fragestellungen bzgl. ausgewählter klimapolitischer Instrumente im Verkehrssektor*. Legal opinion on behalf of the Stiftung Klimaneutralität

30 Electrify road kilometers for lorries

Electrification of lorries will be accelerated, with the aim of achieving one third CO₂-free road kilometers for lorries by 2030. This will be achieved through relief from the lorry toll for zero emission vehicles, a tightening of CO₂ fleet emission standards by the EU and innovation corridors for the lorries of the future. The lorry toll will be extended to all roads.

Background:

In heavy goods vehicle transport, operating costs play a key role for investment. Electric lorries are already exempt from tolls. Under the new Eurovignette Directive, on the one hand zero emission vehicles should be exempt as far as possible and on the other heavy goods vehicles with combustion engines should be more heavily penalized via a new CO₂ component. While a rapid electrification can be

anticipated for small and medium-sized lorries, truck trailers and articulated lorries are practically unavailable in electric versions. In order for manufacturers to supply them sooner, the EU target level for CO₂ fleet limit values must be raised and the offsetting of synthetic fuels rejected.

A decision about the route for designing overhead lines, fast charging points and/or hydrogen filling stations for electric truck trailers and articulated lorries can best be made on the basis of practical experience. Innovation corridors for electric lorries of the future should therefore be established.

Regulation proposal:

As part of the German implementation of the Eurovignette Directive, a CO₂ component of around EUR 200/ton CO₂ will be aimed for. In addition, the infrastructure component of the toll for electric lorries will be reduced to the planned minimum in the Eurovignette Directive. The toll exemption for natural gas vehicles will be removed.

The German Federal Government will vote at EU level for the increase of the CO₂ reduction target for heavy commercial vehicles and against the offsetting of electricity-based synthetic fuels and biofuels.

300 to 500 kilometers long innovation corridors for electric lorries of the future will be fitted out with overhead lines, fast charging points and hydrogen filling stations and their operation coordinated.

Explanation:

For lorry transport, the introduction of a CO₂ component in the heavy goods vehicle toll is the key parameter for guaranteeing a CO₂ price that includes transit traffic through Germany. In order to produce the biggest possible incentive for the technology transition, the German implementation of the

Eurovignette Directive should aim for a CO₂ component of around EUR 200/ton CO₂. Along with the reduction in the infrastructure component of the toll for electric lorries to the minimum amount planned for the Eurovignette Directive, additional cost incentives for using electric lorries can be created.

The CO₂ fleet limit values for heavy commercial vehicles were not set with the prospect of a large-scale electrification of this vehicle segment. It is likely that small and medium-sized lorries as well as buses will quickly make a substantial switch to electric drives. This weakens the CO₂ reduction for combustion vehicles and electrification, especially in the truck trailer and articulated lorry segment. Raising the target level will guarantee the effectiveness of the regulation. The two targets of electrification and raising efficiency for combustion engines would be weakened by offsetting particularly electricity-intensive synthetic fuels and biofuels. Offsetting should therefore be rejected.

Each of the three options supplying energy to electric truck trailers and articulated lorries brings challenges and high investment requirements. What is now needed is to gather practical experience and gain a better understanding of the technical and organizational options so that a decision about which path to follow can be made as quickly as possible.

The proposal is based on, for example:

Agora Energiewende/Agora Verkehrswende (2020): *Dual-Benefit Stimulus for Germany: A Proposal for a Targeted 100 Billion Euro Growth and Investment Initiative*

31 Ensure the required expansion of the charging infrastructure

The charging infrastructure master plan will be further developed. This contains a vision for the expansion of the charging infrastructure and a package of

instruments that will enable the targets to be reached. The vision includes the gradual expansion of Vehicle-to-Grid, that is, the capacity for bidirectional charging.

Background:

The development of the charging infrastructure was significantly accelerated over recent years and given considerably higher funding. However, it is still progressing too slowly to keep pace with the share of electromobility in the vehicle fleet predicted for 2030. There are currently around 40,000 publicly accessible charging points. This compares to the need for a publicly accessible charging infrastructure of 440,000 to 840,000 charging points in 2030 (depending on the charging infrastructure development scenario).

Expanding the charging infrastructure requires the coordinated action of many actors: the German Federal Government and the federal states need to act in unison, agreement is needed between various departments of municipal administration bodies, the actors in the energy industry have to agree with those in the transport sector about appropriate energy framework conditions for charging current: the planning processes for developing the charging infrastructure are complicated and often take too long.

Establishing the National Centre for Charging Infrastructure (Leitstelle-Ladeinfrastruktur) in 2020 was an important step for adopting a more strategic approach to the framework conditions for and funding of the charging infrastructure in the long term. Many of the laws that relate to electromobility and the charging infrastructure are not well adapted to each other so far. This gives rise to legal uncertainties and obstacles that further complicate and delay the development of the charging infrastructure. The former Charging Infrastructure Master Plan was a good first step but has not yet been fully implemented.

Regulation proposal:

The Charging Infrastructure Master Plan will be revised and developed further – with a mission statement for expanding the charging infrastructure and a wide-ranging package of instruments – in order to reach the stated objectives. The following elements need to be taken into account:

- **Companies:** The legal delimitation of different charging processes at company and residential locations will be radically simplified.
- **Companies:** Companies will be systematically included in charging infrastructure funding programs.
- **Demand prices:** The very different and, for the fast charging infrastructure, generally obstructive network demand prices will be replaced by a country-wide unified average network unit price.
- **Smart Charging and Vehicle to Grid:** Time-of-use tariffs for end customers will be introduced in the German Network Charges Ordinance (Stromnetzentgeltverordnung, StromNEV) and the German Energy Industry Act (EnWG), in order to enable Smart Charging. The technical conditions will also be created to rapidly establish bidirectional charging.
- **E-carsharing:** The German Federal Government's funding regulations will be reviewed, so that they enable funding of e-mobility for car-sharing parking spaces in public areas. The Federal Government will also provide support to local authorities for developing plans to facilitate and fund further electrification of the carsharing fleets.

Explanation:

- **Companies:** Current regulations related to the EEG complicate the development of charging infrastructure in companies because, for companies with EEG privileged treatment, it produces

financial and legal uncertainties. However, companies are an important actor when developing a comprehensive charging infrastructure.

- **Demand prices:** The demand price for the network charge is applied for the maximum power used in the year (peak demand) – irrespective of whether only one vehicle is charged once or many vehicles are charged frequently. Rapid charging, in other words charging using high power, is therefore expensive and unattractive for providers, especially during the ramp-up of electromobility. In addition, the very variable network charges from over 800 distribution network operators lead to differing investment conditions for rapid charging infrastructure in different regions.
- **Smart Charging and Vehicle to Grid:** The originally attempted reform of Section 14a of the German Energy Industry Act (EnWG) via the draft for the "Flexible appliances Act" (Steuerbare-Verbrauchseinrichtungen-Gesetz, SteuVerG) would have been counterproductive for electric car owners as they would have been affected by a binding electricity limitation under certain circumstances. At the same time, it fails to enable the essential flexible tariffs for sector coupling, i.e., the introduction of Smart Charging. In the long-term, bidirectional charging is important for sector coupling.
- **Carsharing:** The Charging Station Ordinance (Ladesäulenverordnung, LSV) and the German Federal Government charging guidelines do not take any account of the development of charging infrastructures for station-based carsharing on public land. What is more, under the Carsharing Act and the regional carsharing legislation, local authorities only assign parking spaces to a car-sharing provider for a maximum of eight years. The contracts that local authorities conclude with charging infrastructure operators sometimes run for up to 20 years. This means a lack of planning security and a hurdle for the development and operation of charging infrastructure for a particularly useful type of car use.

The proposal is based on, for example:

Agora Verkehrswende (2021): *Unternehmens-Ladesäulen für alle Fälle. Wie Bund und Länder den Ausbau der Ladeinfrastruktur für Elektromobilität an Unternehmens- und Wohnstandorten voranbringen können*

Regulatory Assistance Project/Agora Verkehrswende/Agora Energiewende (2021): *Ladeblockade Netzentgelte. Wie Netzentgelte den Ausbau der Schnellladeinfrastruktur für Elektromobilität gefährden und was der Bund dagegen tun kann*

Agora Verkehrswende/Agora Energiewende/ Regulatory Assistance Project (2021): *Stellungnahme zum Entwurf des Steuerbare-Verbrauchseinrichtungen-Gesetz (SteuVerG)*

32 Expand the rail network

The rail network will be expanded with the aim of doubling passenger numbers and achieving a 25 per cent share of freight traffic. Funding will be provided for technologies for digitalization, automation and electrification of rail transport and additional loading and unloading facilities will be created for freight transport across the country.

Background:

The aim is to double public transport by 2035 compared to 2016. For the railway network this means an increase of 70 per cent for passenger transport and 50 per cent for freight by 2030. Besides a rapid acceleration in the development of the rail infrastructure, this requires support for technologies for digitalization, automation and electrification as well as additional loading and unloading facilities across the country.

Regulation proposal:

The clear shift of transport onto the railways will take place by orientating the infrastructure towards the "Deutschlandtakt" – a clock-face timetable for the whole of the country – and the system train paths for freight transport included there. The German Federal Government allocates at least EUR 3 billion annually for new and upgraded lines. The Federal Transport Infrastructure Plan will prioritize investment in the rail infrastructure (cf. Item 34).

Technologies for digitalization, automation and electrification of rail transport will be given more funding and accelerated. Additional loading and unloading facilities will be created for freight transport across the country. The Federal financial resources required for this will be earmarked at an adequate level over a number of years.

The train path prices for freight transport and parts of passenger transport will be permanently reduced so as to cover the fixed infrastructure costs. The Federal Government will close the resulting gaps in the infrastructure funding, thus obtaining better opportunities for quality control.

Explanation:

In order to achieve a major shift in freight and passenger transport demand in favor of rail, railways must offer an attractive alternative to road in the eyes of their (potential) users. The crucial elements both for passenger and freight transport are primarily price, availability, reliability and flexibility.

The key factor for the improvement of rail transport up to 2030 is the gradual implementation of the "Deutschlandtakt" program. This aims to synchronize long-distance and local transport so as to enable a train service with short connection times. This will shorten journey times and make passenger access to rail and the public transport system easier. By

developing what are known as system train paths, Deutschlandtakt is also improving rail freight transport.

There is an increase in efficiency of the rail infrastructure thanks to the faster roll-out of the digital train control system ETCS to the infrastructure and rolling stock, as well the electrification of routes which previously required diesel locomotives.

Additional rail links across the country, multimodal transshipment facilities and terminals for combined transport as well as increasing electrification of freight wagons and fitting them with automatic couplings will shorten the loading, shunting and transport times for rail freight.

The proposal is based on, for example:

KCW GmbH (2019): *Railmap 2030 – Bahnpolitische Weichenstellungen für die Verkehrswende (Langfassung)*. Study on behalf of Agora Verkehrswende

33 Improve local public transport (LPT)

Local public transport will be improved with the aim of doubling passenger numbers by 2035 at the latest. This requires a joint effort from the Federal Government, federal states and local authorities who are responsible for local services. The aims include an increase in attractiveness, particularly through fast and coordinated connections, as well as a switch to buses and trains with zero emission drives.

Background:

The transport sector climate goals and a sustainable transport transition mean that an increasing share of transport services will need to be performed by buses and trains. This requires a doubling of passenger numbers in the medium-term. In future local public transport should account for a considerable

share of the transport that is currently done by passenger cars, particularly in urban areas and for commuter traffic. Local public transport routes in inner cities are already often overloaded with the existing services. In more rural areas, the local public transport system first has to become established as an alternative to the private car, along with carsharing and car-pooling schemes. However, local public transport companies and their operating authorities are under major cost pressures, not least due to the slump in passenger numbers during the Covid-19 pandemic. This makes it harder to expand services.

Regulation proposal:

The Federal Government will take on a greater share of the operating costs of the local public transport system. The regionalization funds instrument will be used to enable operating cost subsidies for buses and trams (with the focus on regional transport) in future. The financial resources need to increase along with the additional funding objects.

A revision of the Municipal Transport Financing Act (Gemeindeverkehrsfinanzierungsgesetz, GVFG) will facilitate investments in railway station surroundings and the bus infrastructure. Routes to stations will also be taken into account. The quality of regional stations and tram terminus stations will be improved by developing safe footpaths and cycleways and bicycle storage facilities. In regions where the development of railways is not a feasible option, the infrastructure for high-class and rapid regional bus services should become eligible for funding. In order for the growing investment opportunities not to adversely affect existing project plans, the agreed increase in financial assistance for 2025 should be brought forward.

Explanation:

Direct responsibility for expanding services in LPT rests with the federal states and local authorities. However, in the current financial situation, not all regions will be able to afford a public transport campaign at the necessary pace. Additional support from the Federal Government is therefore necessary.

There are already two proven instruments with which the Federal Government can support the regions, these being the Municipal Transport Financing Act (Gemeindeverkehrsfinanzierungsgesetz) for expanding the infrastructure and the Regionalization Act (Regionalisierungsgesetz) for the running costs. The proposed expansion of the funding objects with corresponding increase in funds offers several benefits: the pace of developing the services will be increased.

The improved services can be financed without increasing fares for passengers. The focus will be removed from the railways to a certain extent, without the planned rail projects being put at a disadvantage. Greater attention will be given to the approach routes to stations that are so important for acceptance and journey times. Faster bus services and a suitably efficient bus infrastructure can quickly lead to improvements in areas where railways will not be available in the foreseeable future. This will enable busy commuter routes between cities and their rural surroundings to be better managed.

34 Plan sustainable transport infrastructure

The Federal Transport Infrastructure Plan (FTIP) will be adapted to the requirements of a climate-neutral Germany in 2045. The review of the requirements plan set for December 2021 will be used to introduce a reorientation. Priority will be given to maintaining the substance of the transport infrastructure. The available budget resources will be primarily used for expanding the rail network. The review of the

requirements plan will be completed in 2023. In 2024 the expansion legislation will be adapted for the different modes of transport.

Background:

The Federal Transport Infrastructure Plan represents an important planning instrument for infrastructure in the area of roads, rail and water. Although transport is a major contributor to greenhouse gas emissions, the FTIP is not aimed at the legally prescribed climate goals but is based on the historical traffic volume without a distinction according to environmental damage. In addition, the Federal Transport Infrastructure Plan is not a legally binding instrument. Nevertheless, it has a large practical impact and, with a term of 15 years, it sets the trend for the medium- to long-term infrastructure development.

Regulation proposal:

In order to formulate the Federal Transport Infrastructure Plan which is currently very focused on road development to be more climate friendly and take account of environment policy, a realignment will be implemented during the upcoming review of the requirements plan in December 2021. The requirement plans in the current Federal Transport Infrastructure Plan will be evaluated on the basis of the new climate change objectives: structural maintenance will be given precedence over expansion and new construction. The available budgetary resources will be used primarily for the expansion of the rail network. If bottlenecks in the road network are predicted, the expansion of parallel railways will be examined. The review will be concluded by 2023 so that the expansion legislation of the different modes of transport can be adapted in 2024 based on the review.

Explanation:

The FTIP, which in itself is not binding, will develop binding force via the expansion legislation based on it. The upcoming reviews of the requirements plan are an opportunity for a revision of the FTIP. Based on the new climate change objectives, the current requirement plans will be evaluated and adapted using clear and binding criteria.

The proposal is based on:

Becker Büttner Held (2021): *Der Bundesverkehrswegeplan. Status Quo, Reformbedarf und Änderungsmöglichkeiten.* Legal opinion on behalf of the Stiftung Klimaneutralität and Agora Verkehrswende

35 Abolish environmentally damaging privileges for air transport

Financial privileges for air transport will be removed. Aviation Tax (Luftverkehrsteuer) rates will be raised to the level of the value added tax rate of 19 per cent. At EU-level, the German Federal Government will advocate a tax on jet kerosene under the EU Energy Tax Directive and the removal of the free allocation of certificates in the EU ETS for internal European air transport.

Background:

Aviation is the most harmful form of travel for the climate. GHG emissions from aviation have risen steeply over the last 20 years while total greenhouse gas emissions in Germany have fallen significantly from 1990 to 2019. Notwithstanding this, aviation enjoys exemption from numerous taxes and levies compared to other modes of transport such as rail and road as well as other sectors. The national budget misses out on billions as a result. This affects the following areas in particular: 1. While other modes of transport (for example road and rail transport) are

subject to energy taxes, aviation is exempt from energy taxation. 2. Value added tax at the rate of 19 per cent is currently only levied on domestic flights in Germany. There is no VAT payable on cross-border flights between two countries within the EU nor on international flights to non-EU countries, which are responsible for around 94 per cent of the emissions from air transport. 3. The EU Emissions Trading Scheme only covers internal European flights. In addition, 85 per cent of the certificates are allocated free of charge and only 15 per cent auctioned. In order to reach the climate neutrality targets, this privileged treatment must be removed.

Regulation proposal:

In order to compensate the lost value added tax on international flights, the Aviation Tax in the three existing distance classes will be raised to the level of the VAT rate of 19 per cent of the average ticket price and a distinction made between economy and business class. The tax will be extended to incoming flights. This requires an examination of how the Aviation Tax can be offset against the existing ticket levies of other states. The Aviation Tax will be extended to air cargo. An assessment will be made of how high the tax levels need to be in order to compensate the lost VAT on international freight, and these will then be introduced in stages.

At European level, under the current reform of the EU Energy Taxation Directive, efforts will be made towards introducing an EU-wide taxation of kerosene on internal European flights at the level of the minimum tax rate of 33 cents/liter. As part of the upcoming revision of the EU ETS Directive, work will be started towards ending the free allocation of certificates and auctioning all certificates. The cap for aviation will be adjusted to the new EU climate goal for 2030. Parallel to this, the inclusion of non-CO₂ effects will be initiated through systematic monitoring.

Explanation:

In order to remove the existing privileges of the aviation industry in terms of energy- and climate-related levies, there is a range of options at national and European level whose implementation varies in terms of effectiveness and practically. An extension of VAT to cross-border flights is technically and politically difficult to implement as, amongst other reasons, this would require a change to the EU VAT Directive and the agreement of all EU member states.

Replacing the lost VAT on cross-border air transport by an increase in Aviation Tax can be quickly implemented and is legally admissible. The implementation is not dependent on either a change in the law at European level nor on bilateral aviation agreements. Increasing the Aviation Tax which compensates the exemption on VAT generates a considerable sum of lost budgetary revenue, which will be required for the transformation of the economy – including the aviation sector – towards climate neutrality.

In parallel the ongoing reform processes to the EU Energy Taxation Directive and the EU Emissions Trading Directive should be used to remove the current privileged treatment for energy taxation and CO₂ pricing.

The proposal is based on:

Siemons, Anne et al. (2021): *Options for regulating the climate impacts of aviation.* Study by the Öko-Institut on behalf of the Stiftung Klimaneutralität

36 Support local authorities for the mobility transition in towns and cities

Initial changes to road traffic legislation will be made via an immediate action program. The regulatory purpose of road traffic legislation will be expanded and in future will include climate and environmental

protection, health protection, the safety of all road users and support for sustainable urban development. The scope for action by local authorities will be expanded. They will obtain better options for controlling the traffic according to their own objectives, re-allocating public spaces and giving weaker road users priority.

Background:

Up until now, road traffic law has put passenger car traffic center stage. This applies to both the Road Traffic Act (Straßenverkehrsgesetz, StVG) and the Road Traffic Regulations (Straßenverkehrsordnung, StVO) as well as to subordinate regulations. This legislation deals with a regulatory law limited in scope to averting dangers. Under case law, its aim is to ensure the "safety and smooth flow" of traffic. There is no basis in it for an overall regulation in terms of controlling road traffic. Aspects such as the protection of the environment, climate and health are missing or are at least not central aims of the body of legislation. Even the last 2020 amendment to the StVO did not question the overall orientation of road traffic law. The necessary transformation of the transport system is not possible with these legal provisions.

Regulation proposal:

The regulatory purpose of the road traffic law will be expanded and will in future include: 1. the safety of all road users; 2. the protection of the climate, environment and health and 3. urban development. The scope of activity for local authorities in shaping the mobility transition will be expanded. A revision of Section 45 StVO will make it easier in future for local authorities to take measures to reallocate public space and to boost sustainable transport (such as the certification of cycle paths).

Explanation:

Success in reducing transport-related greenhouse gas emissions will only be achieved when mobility behaviour changes – in favour of a mobility network (LPT, walking and cycling, complemented by sharing services such as carsharing and ride-pooling). Local authorities play an important role in expanding the mobility network as many planning decisions can only be sensibly made at local level.

In accordance with the current legal situation and particularly the general condition of Section 45 of the StVO, measures may essentially only be taken when they serve the smooth flow of the traffic. Added to this is the structural alignment of Road Traffic law towards car traffic. A holistic decision based on climate and environmental protection, sustainable urban development and attention to particularly vulnerable groups is not actually wanted.

In order to meet the requirements of environmentally friendly urban planning and traffic management as well as health and safety, there is a need for clearer and more conclusive regulations in the road traffic law at Federal Government level.

The proposal is based on:

Becker Büttner Held (2021): *Sofortprogramm Mobilitätswende. Stärkung kommunaler Handlungsmöglichkeiten im Straßenverkehrsrecht*. Legal opinion on behalf of the Stiftung Klimaneutralität and Agora Verkehrswende

37 Introduce maximum speeds throughout the country

The maximum speed on all German motorways will be set to 130 km/h and in built-up areas to 30 km/h. Local authorities can deviate from this rule in special circumstances and prescribe a speed limit of 50 in built-up areas.

Background:

The Road Traffic Regulations (StVO) regulate maximum speeds in and outside built-up areas. Up to now, deviations from these locally restricted maximum speeds could only be mandated through road signs. In contrast, there is no maximum speed for motorways, but only a non-binding recommended maximum speed of 130 km/h. Germany is one of only a few countries in the world without a general speed restriction on motorways.

Regulation proposal:

Under the Road Traffic Regulations, a maximum speed of 130 km/h will be introduced on all German motorways. The maximum speed in built-up areas will be set to 30 km/h. In justified exceptions a 50 km/h speed limit may be allowed.

Explanation:

Motorized road traffic is responsible for 94 per cent of greenhouse gas emissions in the transport sector. By introducing a general speed limit for passenger cars on German motorways, CO₂ emissions from road traffic will be reduced quickly and without any notable additional costs. The risk of serious accidents will be reduced and the sense of safety of all road users increased.

Reducing the maximum speed in built-up areas increases safety for pedestrians and cyclists who are particularly at risk from the excessive speed of motorized traffic. The change in the law will also provide an opportunity to reduce the "forest of road signs".

The proposal is based on:

Becker Büttner Held (2021): *Sofortprogramm Mobilitätswende. Stärkung kommunaler*

Handlungsmöglichkeiten im Straßenverkehrsrecht.
Legal opinion on behalf of the Stiftung Klimaneutralität and Agora Verkehrswende

38 Establish climate neutrality in the building sector

All funding programs, building energy efficiency law and property management for federally owned buildings will be systematically directed towards the aim of climate neutrality by 2045. This also applies to the Administrative Agreement between the German Federal and State Governments on urban development and to social housing development.

Background:

Along with urban development, the building sector plays a key part on the route to climate neutrality. By 2030 the current annual quantity of emissions of 120 million tons of CO_{2eq} needs to fall to 65 million tons of CO_{2eq} (Study *Towards a Climate-Neutral Germany by 2045*) or 67 million tons of CO₂ (Draft Climate Change Act 2021). In order to reach this goal, by 2030 the use of heating oil must be at least halved, the use of natural gas reduced by over 40 per cent and the share of renewable heat increased to at least 40 per cent. The annual renovation rate must be increased to 1.6 per cent. However, there are already indications that, without additional measures, the previous sectoral targets for 2030 will be missed – despite the introduction of CO₂ pricing for fossil fuels and an improvement in the funding conditions for motor vehicles, market incentives and renovation programs. This applies even more to the new higher target levels.

Regulation proposal:

The aim of climate neutrality by 2045 will be established in the Building Energy Efficiency Act

(Gebäudeenergiegesetz, GEG). All funding programs, property management for federal buildings and administrative agreements between the German Federal Government and the federal states on urban development funding and social housing must be directed towards this. In addition, grants in the Federal Funding for Efficient Buildings (Bundesförderung für effiziente Gebäude, BEG) program will be cut for heating systems run on fossil fuels that are not operated to a significant degree on renewable energies. In addition, administrative agreements on social housing and urban development funding will be designed to be environmentally friendly and coordination meetings quickly set up with the federal states.

Explanation:

In order to make progress with decarbonizing the building sector and at the same time safeguarding the economic viability of the transformation process, it must be ensured that all the specified instruments and programs are committed to the aim of climate neutrality. This is important because the building sector is very slow to respond due to long investment cycles. Heating systems installed now will in general only be replaced in 20 years or more. If these are run on fossil fuels, they not only cement medium- and long-term structures that are harmful to the climate but require infrastructures (for example, gas pipes) that will no longer exist in a climate-neutral future or will only be able to be operated uneconomically due to the declining number of users. Misplaced incentives and therefore stranded assets as well as lock-in effects must be prevented and the heat transition designed to be socially acceptable. In 2020 the German Federal Government provided funding to the federal states of EUR one billion for the construction of social housing. However, up to now the Government has not laid down energy and climate change mitigation criteria for this sector, and for urban development this has only happened at an inadequate level. The German Federal Government should in

future call for nationally unified strict climate change mitigation criteria when allocating financial resources to the federal states.

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

39 Raise energy standards for new and old buildings

In the Building Energy Efficiency Act (Gebäudeenergiegesetz, GEG) the energy requirement for new buildings from 2024 is specified as the level "Efficiency house 40". After this date it will no longer be permitted to install heating systems that use fossil fuels. The GEG lays down increased energy efficiency requirements for any significant alterations to existing buildings; replacement building components must conform to the target level of an "Efficiency house 70". The installation of heating systems operated with fossil fuels in detached or semi-detached houses is likewise not permitted after 2024. Exceptions will be permitted in special cases.

Background:

The Building Energy Efficiency Act (GEG) regulates the minimum energy requirements for new and existing buildings. However, the current provisions of the GEG are insufficient to achieve the required reduction targets in the building stock. While the GEG requirement level for new buildings currently corresponds to the KfW standard of Efficiency house 70, the requirements for existing buildings have

scarcely changed over the last ten years. For example, the so-called "140 per cent rule" still relates to the new build level in the German Energy Savings Act (Energieeinsparverordnung, EnEV) of 2009. This results in the situation where a complete renovation already meets the requirements of the GEG when the building achieves a minimum standard that is around 85 per cent worse than a comparable new build. What is more, other exemptions prevent renovation cases from being set in motion, both in terms of the external envelope as well as the heating system, something which further delays the phase-out of fossil fuels in the heat supply.

Regulation proposal:

The goal of climate neutrality will be established in the GEG. From 2024, installation of heating systems run on fossil fuels will no longer be permitted in new and old buildings. From 2024 the "Efficiency House 40" level will apply to new buildings while renovations in and of old buildings will be to the "Efficiency House standard 70". The energy performance certificate will be designed to be legally admissible.

Explanation:

In view of the longer investment cycles in the building sector, the standards for energy efficiency renovation must be more ambitious, and heating systems need to be replaced more quickly than previously. Clear regulatory provisions will help to limit the necessary price level in the Fuel Emissions Trading Act, thus making an important contribution to social compatibility and acceptance. In order to establish climate neutrality, the GEG must play a greater part in the instrument mix for decarbonizing the building sector than is currently the case. The GEG therefore needs to be further developed so as to trigger more renovation cases, both for the building envelope and for replacement of heating systems so that, for instance, fossil heating systems that currently

dominate the heating market can be rapidly replaced by heat pumps or local and district heating connections. This requires a revision of the renovation provisions in terms of the trigger conditions, the requirement level and the exceptions for existing buildings.

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

40 Expand and further develop building subsidies

Twelve billion euros per annum will be provided for funding climate-neutral new buildings and building renovation. In future, compliance with the legal requirements will form an explicit part of the funding framework.

Background:

In January 2020 the funding conditions for building funding programs were considerably improved. In 2021 funding programs for energy efficiency and renewable energies in the building sector were also restructured through the Federal Funding for Energy-Efficient Buildings (Bundesförderung für effiziente Gebäude, BEG). In future, when regulatory law is systematically aimed at climate neutrality and funding is only granted for standards that meet the targets, building owners must not be left alone with the associated (higher) costs. In future funding practice needs to be directed more to economic necessity and less to regulatory law. This would mean that

measures prescribed under the regulations would also be eligible for funding. A similar link already exists between regulatory law and funding in the area of tax depreciation of renovation measures in listed buildings. The authorities responsible for the protection of historical monuments dictate how a building is to be renovated and which measures are not permitted (for example, no exterior insulation on listed building façades, but instead the considerably more expensive interior wall insulation). As a compensation for the restrictions (and additional costs) this entails, the owners affected can set the costs against tax.

Regulation proposal:

Twelve billion euros per annum will be provided for funding climate-neutral new buildings and building renovation. In future, compliance with the legal requirements will be explicitly part of the funding framework so that statutory standards at the level of the proven funding shortfall for achieving profitability are eligible for funding. The BEG will also implement differentiated support which, depending on the rent level, the proportion of low-income households or other defined indicators, will enable additional funding for buildings in difficult situations. All grants will be focused solely on measures that are compatible with the target of climate neutrality by 2045

Explanation:

Funding of energy efficiency and renewable energies in buildings can make an important contribution to decarbonization of the heat supply if designed appropriately. The reorientation of the principle of support *and* regulate, which in the building sector up to now has tended to be interpreted as support *or* regulate, provides important renovation incentives and increases the acceptance of more stringent provisions in the building stock. It enables building

owners to gain funding for the renovation work required by regulatory law and provides incentives for renovation that meets the targets. For this reason, the efficiency requirement for standards in the Building Energy Efficiency Act should be socially designed and directed towards the climate neutrality goal as well as the actual damage costs of EUR 195/ton CO₂. The changeover to the BEG plus the increase in funding for non-residential buildings as well as in the rented housing stock makes the instrument more important as funding is no longer limited to private home owners.

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

41 Make renovation roadmaps obligatory

Building-specific renovation roadmaps will be given more weight as an advisory instrument. Setting up renovation roadmaps will become mandatory with a change in the owner or a new tenancy agreement. A minimum energy efficiency standard will be introduced so that existing buildings with the worst energy efficiency amongst the commercial property are renovated quickly. These renovations will be funded separately.

Background:

On the route to climate neutrality a crucial factor in the building sector is to increase the renovation rate of currently around 1 per cent to 1.6 per cent by 2030 and at the same time to ensure that the renovations

are undertaken in compliance with the objectives. Not every home owner is in a position to manage a full renovation of the whole building at short notice. It is often sensible to carry out the renovation in stages. The renovation roadmap provides an individualized advisory instrument for the home owner that ensures compliant renovation and avoids excess financial burdens. In Germany around 280,000 existing buildings change owner per year. In addition, around 280,000 buildings are inherited per year. In the detached and semi-detached house segment there are around 250,000 new lettings per year. Renovation decisions are made in most of the above-named cases, so a change of ownership and new lettings are appropriate points for setting up a renovation roadmap. The example of the Netherlands also shows that the introduction of Minimum Energy Performance Standards (MEPS) for existing buildings can contribute to increasing the renovation rate. In this case owners are obliged to undertake renovations by a particular deadline or milestone, such as the sale of the house or the replacement of a fossil fuel boiler.

Regulation proposal:

In the case of a transfer of ownership (sale or inheritance) of a building, the buyer or inheritor and therefore new owner is obliged to submit an individual renovation roadmap for the building by a specific deadline. This obligation does not apply if only one flat in a multi-family house changes ownership. A similar regulation applies in the case of the reletting of detached and semi-detached houses. In this case the tenant is obliged to submit an individual renovation roadmap. Implementing the proposed measures in the individual building renovation roadmap is voluntary, although for larger-scale alterations, the renovation obligations in accordance with the Building Energy Efficiency Act apply.

In addition, a minimum energy efficiency standard will be introduced so that existing buildings with the

worst energy efficiency amongst the commercial property are renovated quickly. These renovations will be funded separately.

Explanation:

Compared to an energy performance certificate, the individual renovation roadmap has the advantage that, besides the survey of the actual condition, it defines coordinated renovation stages for the affected building that lead to an energy efficiency level corresponding to the ambitious KfW efficiency house standard 70. The proposed introduction of the obligation would increase the demand for an individual renovation roadmap by around 200,000 cases per year. This corresponds to more than ten times the number of renovation roadmaps requested in 2020. This guidance would have a large impact: for the current on-site advisory sessions, four out of five result in at least one material renovation measure. Even if the implementation rate for an obligatory renovation consultation were lower, the measure would significantly increase the demand for renovation measures.

The introduction and gradual implementation of obligatory minimum energy efficiency standards in the commercial property sector contributes – through the setting of a target and endpoint, accompanied by flexibility options and socio-political support – to renovation of commercial buildings and therefore significantly to raising the overall renovation rate. As building classification will be measured via the energy performance certificate in particular, this must be further developed to be legally admissible.

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

42 Provide CO₂ price relief to tenants

From 2023 it will no longer be permitted to pass on the costs arising from CO₂ pricing under the Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz, BEHG) to tenants, so that landlords have an incentive to carry out energy efficiency renovations and switch to zero CO₂ heating systems. Legal conditions will be created for a gradual expansion of all-inclusive rents for new and existing tenancies in order to further strengthen this incentive.

Background:

The specific framework conditions in the building sector such as long investment cycles, low price elasticity and the distribution of the incentives between landlords and tenants lead to the situation where effective climate protection in the building sector can only be achieved with a broad mix of instruments. The CO₂ price is a key instrument in this mix. A higher CO₂ price stimulates investment in climate-neutral heating systems and other measures for building renovation. In Germany, however, over 40 per cent of the population live in rented accommodation. As, under the regulations in force, heating costs are borne by the tenants, CO₂ pricing does not produce a direct incentive for landlords to renovate their properties. Tenants can themselves only make a limited contribution to CO₂ reduction by adapting their heating behavior. There is a danger that the landlord-tenant dilemma will increase due to CO₂ pricing because tenants are penalized more heavily but have very little opportunity to make savings. This is a problem especially for low-income households.

Regulation proposal:

From 2023, the costs resulting from CO₂ pricing should no longer be transferred to tenants. For local heating systems such as single-storey heating systems or in rented detached houses, an appropriate tenants' reimbursement requirement from the landlord will be introduced. The legal conditions will be created for a legally admissible definition and a gradual expansion of all-in rents for new and existing rental agreements. As part of the revision of the EU Energy Efficiency Directive, approval will be given for all-in rents with the option of temperature-based billing. It will then be possible to adjust the Heating Costs Ordinance (Heizkostenverordnung) so that all-in rents will be set as standard for new rental agreements.

Explanation:

The costs associated with decarbonizing the housing stock must be allocated in a socially fair manner. Restricting the right to apportion the CO₂ pricing will address the issue that the decision to implement energy efficiency modernization measures usually lies with the building owner, while the costs incurred through CO₂ pricing are borne by the tenants under the current legal situation. In order to provide an incentive for landlords for energy efficiency renovation and conversion to zero CO₂ heating systems, and for CO₂ pricing as a climate policy instrument in rented buildings to develop a steering effect, these costs should no longer be able to be transferred to the tenants.

The inefficiencies that arise from the landlord-tenant dilemma could be further removed with the introduction of all-inclusive rents. Temperature-indexed all-in rents have the advantage that tenants only pay for a specific temperature in the flat and therefore have an incentive to use less electricity. If the heating costs are included in the rent, then landlords will try to reduce their heating and CO₂ costs, as

each cost reduction generates an additional monthly income, which can be used to refinance the measure.

It is then not possible to adjust the all-in rent due to rising energy or CO₂ prices or modernization measures put in place. The higher the CO₂ prices, the more economical the measures become. In this way CO₂ pricing can also develop a dynamic on the rental market.

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Agora Energiewende/Universität Kassel (2020): *Wie passen Mieterschutz und Klimaschutz unter einen Hut?*

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

43 Lower the modernization allocation

The modernization levy for energy efficiency renovation will be lowered to 1.5 per cent. In future, grants do not have to be deducted from the apportionable costs, thus remaining with the building owner ("thirds model").

Background:

With the current form of the modernization allocation in accordance with the German Civil Code (Bürgerliches Gesetzbuch, BGB), Section 559(1), after carrying out energy efficiency modernization measures described under Section 555b, landlords can increase the annual rent by eight per cent of the costs incurred. The level of the allocatable costs is therefore

determined solely by the costs of the measure and is independent of the energy savings achieved by the measure. Moreover, there is only a limited incentive for landlords to take up grants as the grant must be subtracted from the allocation to the tenants. There is therefore only a limited incentive for landlords to invest in ambitious renovation measures and in addition, the modernizations often do not result in energy savings that offset the costs for all-in rents.

Regulation proposal:

The revision of the modernization levy includes three components ("thirds model"): first the modernization levy is reduced to 1.5 per cent, whereby, contrary to the current regulation, grants must not be deducted from the allocatable costs. In addition, the funding conditions for targeted grants will be improved (subsidy share for efficiency house 55 (EH 55) up to 40 per cent and for individual measures up to 30 per cent) along with elimination of non-targeted funding objects (EH 85, 100, 115 and subsidies for fossil fuel boilers). Finally, undue hardship will be alleviated through the provision of public resources, for example if energy efficiency modernization causes a significant and undue increase in the all-in rent for tenants.

Explanation:

The reduction in the modernization levy contributes to relief for tenants when energy efficiency modernization measures are implemented. At the same time, through the significant reduction in refinancing opportunities, it creates an incentive for landlords to take up grants. Changing the funding conditions as well as the phasing out of grants for non-target-compliant measures will ensure that the measures undertaken meet the objectives.

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Ifeu-Institut (2019): *Sozialer Klimaschutz in Mietwohnungen*. Short expert report on the socially and climate-compatible allocation of the costs for energy efficiency modernization in the housing stock

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

44 Introduce compulsory municipal heat planning

Following the example of Baden-Württemberg, all federal states will be obliged to introduce compulsory municipal heat planning for all the larger local authorities. Seasonal heat accumulators and the limited potential of biomass and green hydrogen must be included in the plans.

Background:

Local authorities and city councils have a key role to play in decarbonizing the building sector. With the help of heat plans at municipality level they can ensure that both investment decisions for buildings as well as decisions on infrastructure development in neighborhoods, city districts and whole towns follow an overriding strategy that links the goal of climate neutrality to heat supply measures. This is all the more important because, by 2045, heating will have had to undergo a fundamental transformation. By 2030, around six million heat pumps will be installed and 220,000 flats will be connected to the district and local heating supply annually in order to meet the ban on heating systems run on fossil fuels in both

new and existing buildings. This requires both an acceleration of the expansion of the network-based heat supply while simultaneously planning and monitoring the dismantling of the local gas grid.

Local authority heat plans have been successfully developed in European countries for years, especially in Denmark, Switzerland and Austria. In Germany there has so far been no national obligation to establish them. The German Constitution (Section 85, clause 1 (7)) prohibits the Federal Government from delegating functions directly to the municipalities. At federal state level, the Land Baden-Württemberg has, with the help of a climate change act, obligated large district towns and municipal districts to submit municipal heat plans by 31 December 2023, while the Free and Hanseatic City of Hamburg created a climate change act itself in 2020 along the lines of the Climate Change Act 2020.

In order to ensure that all local authorities successfully plan and implement the technology and infrastructure transformation that accompany the energy transition, the Federal Government must hold all federal states responsible for undertaking heat planning in their area of authority. The federal states can either do this themselves or entrust this task to the local authorities or regional planning associations via their own state legislation.

Regulation proposal:

Following Baden-Württemberg's example, the federal states will be legally obliged to introduce binding heat planning for all larger local authorities. Seasonal heat accumulators and the limited potential of biomass and green hydrogen must also be considered in the plans. The funds provided by the Federal Government can only be used for measures and technologies that fit with the transformation strategies detailed in the heat plan and the goal of a climate-neutral building stock. Local authorities will be enabled to transfer local heat networks to public hands

and to determine the content of municipal heat plans to be legally binding under external law.

Explanation:

The heat transition in the building sector is characterized by very long investment cycles (for example for heat, electricity and gas distribution networks) as well as by the need to convince many millions of house owners to retrofit their heating systems. With the help of analyses of the building stock and potential as well as formulating target scenarios, town and municipal authorities can produce concepts and plans to guide the transformation process towards a climate-neutral heat supply. Municipal heat plans supply the framework for a series of local authority taxation instruments, such as the identification of priority areas for expanding district heating and building renovation, securing sites for such things as seasonal heat stores and determining gas withdrawal areas while taking account of the limited potentials of biomass and green hydrogen.

The proactive identification of green collective heat districts and of areas with anticipated climate-neutral individual heating solutions (especially heat pumps), creates planning security for both companies and building owners and guarantees the intelligent, resource-saving and cost-efficient conversion of the local authority and regional heat supply by 2045 while at the same time ensuring public acceptance for the goals of the energy transition.

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

45 Funding serial renovation

A one-off EUR 10 billion funding program will herald the market introduction of industrial energy efficiency renovation (Energiesprong). In order to meet the lack of skilled tradespeople, new apprenticeships will be introduced at the interface between trades, planners and architects, and support given for re-training.

Background:

The renovation requirements and incentives set by the Federal Government will only produce an impact if the measures are implemented quickly and there is enough skilled labour. Besides boosting trades, serial renovation offers great potential for achieving a climate-neutral building stock. In the Netherlands, for example, houses are renovated within a few weeks to a zero-energy standard according to the Energiesprong principle with the help of prefabricated façade panels in combination with heat pumps and solar roof panels. However, the structure of privately owned buildings is much more diverse in Germany. Energy efficiency renovation is often technically and financially complex. The difficulty in generating large volumes could be a reason why Germany has not so far succeeded in achieving large-scale effects with projects based on the Energiesprong concept. Serial renovation in Germany lacks market-readiness although there is an Energiesprong potential of five million flats.

In addition, increasing the statutory requirements stimulates a structural transformation in the building sector. While most of the 750,000 boilers installed per year have so far been for fossil fuels, in future it will mainly be heat pumps. In addition, the aim is to connect 220,000 flats annually to the district heating supply by 2030 and 340,000 by 2045.

Regulation proposal:

To meet the lack of skilled tradespeople, new skilled occupations will be introduced at the interface between trades, planners and architects. The skills shortage will be mitigated by individual measures such as transformation short-time working benefit, the increase and alignment of training allowances, reaching new target groups by adapting sectoral legislation and retraining programs as well as attractive further education and training opportunities.

A EUR 10 billion funding program will provide incentives for the development of cost-reducing serially-produced renovation components. A risk fund will support companies and start-ups that provide digitalized, highly process-optimized trade services. Preconfigured high quality elements will be defined for standardizable components and put out to tender in different lots.

Explanation:

Building renovations should not be seen as a purely individual task for building owners but also as a task for the whole of society. Around 19 million residential buildings in Germany require to be renovated of which many do not come under the care of professional housing companies. For these projects this means that there is generally no detailed information on energy efficiency and heat supply technologies, funding programs or the markets for energy, building and trade services. It is important to support all the trades involved in renovating a house, so that the regulatory provisions can be complied with and the funding used efficiently. Government must send out reliable signals in order to motivate the companies operating in Germany to develop the skills and (digital) processes necessary for serial renovation. The Federal Government is accelerating the development of standardized house and efficiency technology at cost-effective prices by means of a one-off EUR 10 billion funding program. This includes the

development of prefabricated package solutions such as heating systems for multiple family dwellings and prefabricated façade units that combine insulation, heating and ventilation components. Bundling the needs of public buildings generates additional economies of scale and investment incentives for companies.

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Deutsche Energie-Agentur (2021): *NetZero-Standard nach dem Energiesprong-Prinzip*

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

46 Increase incentives for heat pumps

Heat pumps are a key technology for the heat transition. Funding and restructuring of the levies, fees and payments on electricity make the installation and operation of a heat pump almost as cheap nowadays as oil or gas heating. They will therefore become cost-effective and efficient standard solutions in new buildings and for detached and semi-detached houses in the building stock when, in 2024, the installation of new fossil fuel heating systems is no longer legal except in special cases.

Background:

Heat pumps are central to decarbonizing the building sector. In order for the change to zero CO₂ heating technologies to succeed, the share of living space heated with a heat pump needs to increase to around 24 per cent by 2030 (approx. 6 million heat pumps)

and to 60 per cent by 2045 (approx. 14 million heat pumps). In addition to the broad ban on installing fossil heating technologies in the building energy efficiency law (see Item 39), for heat pumps to become established alongside district heating as the preferred environmental and economical heating technology for detached and semi-detached houses and multiple family dwellings in new build and the housing stock, levies, taxes and fees on the electricity price must be systematically reduced and more flexibly designed as quickly as possible. Currently the price for the electricity required for operating heat pumps is just under four times as much as the price for heating oil and natural gas due to differences in taxation. This represents a massive distortion of competition in favor of gas heating at the expense of heat pumps.

Regulation proposal:

The competitive distortions at the expense of heat pumps will be ended. The restructuring of the levies, fees and charges (particularly the Renewable Energy Sources Act, the CHP levy, electricity tax and network charges) means that the electricity used for operating heat pumps will be more economical. The funding programs for heat pumps will also be designed in such a way that the use of heat pumps in the building stock is also financially attractive and economies of scale will drive down costs. The broad ban on installing fossil fuel heating systems in the building energy efficiency law then creates a dynamic and cost-effective market ramp-up for heat pumps.

Explanation:

Up until now the market share of fossil heat generators has been around 85 per cent. The phasing out of fossil fueled natural gas and oil heating will result in renovation of the heating systems. The high electricity prices in comparison to fossil fuels resulting from

levies and fees, puts heat pumps at a disadvantage and prevents the necessary rapid roll-out and installation of heat pumps in the building stock. While the broad ban on installing heating systems run on fossil fuels will create a clear increase in the demand for heat pumps, particularly in detached and semi-detached houses, this will have to be backed up by a reform of the cost structures. Besides a clear and constantly rising CO₂ price, the electricity price components – particularly the EEG and CHP levies – must be reduced and made more dynamic so that using heat pumps represents the most economic form of heat supply, not only in new buildings but also in (partially) renovated buildings. In order to enable a flexible control and operation adapted to the supply of fluctuating electricity generation, the funding requirements for heat pumps must also be gradually adapted to the requirements (for example, control systems, heat stores).

The proposal is based on:

Agora Energiewende (2021): *Ein Gebäudekonsens für Klimaneutralität. 10 Eckpunkte wie wir bezahlbaren Wohnraum und Klimaneutralität 2045 zusammen erreichen*

Öko-Institut/Hamburg-Institut (2021): *Agenda Wärmewende 2021*. Study on behalf of the Stiftung Klimaneutralität and Agora Energiewende

47 Introduce nutrient accounting

Nutrient accounting will be introduced at individual farm level in order to limit balance surpluses. This will be supported by a future tax on mineral nitrogen.

Background:

In Germany, over half the emissions of reactive nitrogen compounds come from agriculture. This

results in many negative environmental impacts in relation to the quality of surface waters and groundwater, biodiversity, the quality of breathing air and greenhouse gas emissions. Nitrous oxide in particular (N₂O) is a powerful greenhouse gas. In order to reduce the emissions of reactive nitrogen compounds, nutrient cycles need to be more efficiently closed. The main approach to this is the fertilizing policy. This is currently aimed particularly at conservation goals for water bodies and does not contribute enough to the necessary improvement in the utilization of nitrogen and reduction of surpluses in agriculture. The present German Fertilizer Ordinance (Düngeverordnung) is the result of decades of political refusal to initiate effective measures to reduce nitrogen surpluses in agriculture. The existing regulations have little effect and are not specific enough.

Regulation proposal:

Nutrient accounting will be introduced at individual farm level (farm gate accounting or nutrient flow accounting). In future 1. a reliable, transparent and verifiable (e.g., evidence-based) balance calculation will be required; 2. adequately ambitious nitrogen balances including binding milestones for achieving the German sustainability strategy (max. 70 kg N/ha) will be defined; and 3. legally secured access to data on the substance flows of relevance for nitrogen balances guaranteed to the monitoring authorities.

A nitrogen tax will be introduced to support this system in the form of a quantity-related purchase tax on the nitrogen content of mineral fertilizers, initially with a moderate tax rate (50 cents/kg nitrogen). The tax on synthetic nitrogen is charged in the retail trade. Revenue will be fed back to support environmentally-compatible agricultural conversion (innovation funds, refund model).

Explanation:

Nutrient flow accounting offers a major opportunity for understanding and assessing the nutrient flows into and out of the farm more accurately, in order to effectively reduce surpluses in the farms and in the entire agricultural sector. Its implementation will be supported by the establishment and utilization of a systematic digital accounting log. The inability to check fertilizer quantities casts doubt on every attempt to regulate fertilizer levels, irrespective of whether this is to be done via the assessment of fertilizer demand or the material flow balance. However, implementing it in its entirety requires some preparation time.

The accompanying introduction of a nitrogen tax will take immediate effect. It functions as a kind of "safety belt" in case of further delays for balancing and limiting balance surpluses. If the accounting is not carried out thoroughly, the tax should be raised further.

A tax on nitrogen would also have positive effects on other sustainability factors. It would lead to an increase in growing leguminous plants, more crop rotations and a reduced application of fungicides (due to less dense crops) as well as incentives for the better spatial distribution of organic fertilizers.

The proposal is based on:

Grethe, Harald et al. (2021): *Klimaschutz im Agrar- und Ernährungssystem Deutschlands: Die drei zentralen Handlungsfelder auf dem Weg zur Klimaneutralität*. Expert report on behalf of the Stiftung Klimaneutralität.

48 Increase VAT on animal products

The privileged treatment of animal products in relation to VAT will be ended. In future animal products will be subject to the standard rate of 19 per cent. The

additional revenue will be used to support climate-friendly agriculture.

Background:

The production of plant-based food is significantly more resource-efficient than the production of food based on animal products. The latter require more agricultural acreage, create significantly higher GHG emissions per nutritional unit and have other negative environmental effects, such as on water and air quality. Around 58 per cent of agricultural land in Germany is used for animal feed production. Germany also imports large quantities of animal feed that comes from environmentally damaging manufacture. Reducing GHG emissions from animal production through technological improvements alone is not sufficient to guarantee an adequate contribution by agriculture to implementing the climate change objectives. The necessary reduction in GHG emissions from livestock farming therefore requires a significant reduction in the amount of food of animal origin produced and consumed in Germany.

Regulation proposal:

The reduction in the production and consumption of animal products will be achieved via a broad mix of instruments. Raising awareness about the links will support informed decision-making: price incentives will target consumption and better labelling will strengthen consumer sovereignty. The German Value Added Tax Act (Umsatzsteuergesetz) will be changed so that in future the basic rate of 19 per cent will be payable on animal products. The additional revenue will be used to support climate-friendly agriculture. To achieve long-term stable changes, support will be given to educational programs in nurseries and schools along with sustainable catering. Moreover, a government climate label for foodstuffs will provide consumers with clear information on the climate impact of their consumer choices.

Explanation:

In Germany a reduction in the consumption of animal products has been recommended for a long time by numerous scientific committees, including various advisory boards of the German Federal Ministry of Food and Agriculture (BMEL). In relation to human health, there are clear indications of a link between the consumption of processed meat products or red meat and the occurrence of some types of cancers. The German Nutrition Society (Deutsche Gesellschaft für Ernährung, DGE) recommends that current consumption levels should be reduced by half.

In terms of the animal welfare situation in Germany, the minimum requirements of current livestock management are deemed unsatisfactory, both from society's viewpoint as well as that of animal welfare. Reducing overall animal numbers as part of improved livestock management would produce synergies with climate protection.

The specific GHG emissions per product or nutritional unit are higher for animal products than plant ones. In terms of the acreage per capita requirement, it is clear that our type of diet cannot be transferred to the whole world. Ultimately, reducing the numbers of domestic livestock by limiting the requirements for feed acreage opens up a higher level of freedom for further developing land use for climate protection.

The proposal is based on:

Grethe, Harald et al. (2021): *Klimaschutz im Agrar- und Ernährungssystem Deutschlands: Die drei zentralen Handlungsfelder auf dem Weg zur Klimaneutralität*. Expert report on behalf of the Stiftung Klimaneutralität.

49 Develop a future vision for livestock farming

A long-term sustainable vision for livestock farming will be developed in cooperation with livestock farmers, trade and consumer associations. The aim for the future is fewer animals, improved animal welfare, stable incomes and good food.

Background:

Although the necessity of reducing consumption and production of animal products is already the subject of socio-political debate, so far there has been a great reluctance to act both amongst policy makers and in the sector. Examples of this are the recommendations of the Kompetenznetzwerk Nutztierhaltung (2021) (Network of expertise on livestock farming) that focuses on a significant increase in animal welfare but envisages constant numbers and does not address the necessary reduction. Although the BMEL's livestock farming strategy (2019) puts forward technological optimization options, it likewise fails to address the necessary reduction of consumption and production. The fundamental truth is that we need a long-term plan for livestock farming in Germany. This includes not only society's agreement on the issue of how animals should be kept (animal welfare, environmental effects) but also on the issue of how many and which animals should be kept in future in Germany from a broad sustainability viewpoint and what consumption volumes match this. Clear policy goals and sustainable perspectives are necessary in order to provide those involved with orientation for future investments.

Regulation proposal:

A long-term plan for livestock farming in Germany will be developed by means of a large-scale communication process.

Explanation:

Climate neutrality cannot be achieved without a drastic reduction of emissions in agriculture. This will inevitably have fundamental effects on agricultural products and production structures. Agriculture is in any case under increasing pressure to transform in relation to other sustainability aspects. The restructuring process required on various grounds must be understood and shaped as a task for society.

The proposal is based on:

Grethe, Harald et al. (2021): *Klimaschutz im Agrar- und Ernährungssystem Deutschlands: Die drei zentralen Handlungsfelder auf dem Weg zur Klimaneutralität*. Expert report on behalf of the Stiftung Klimaneutralität.

50 Develop a peatland conservation strategy

As peatlands used for agriculture are responsible for a large proportion of the greenhouse gas emissions by agriculture, a peatland protection strategy will be developed. This will pursue the aim of extensive re-wetting by 2045 and the environmentally friendly economic use of the rewetted peatlands.

Background:

Organic soils used for agriculture (peatlands and mires) account for around 1.3 billion hectares and therefore just under eight per cent of the agricultural acreage of Germany. Drained areas emit around 41 million tons of CO_{2eq} per year. This equals around 40 per cent of the entire GHG emissions from agriculture and agricultural land use, even if these emissions are largely not counted in the national climate goals. In view of the large contribution by drained peatlands to the total GHG emissions from agricultural land use, a very extensive re-wetting program

is economically extremely sensible. After re-wetting, the current conventional agricultural use of these areas is no longer possible. In view of climate change objectives and the very high emissions from drained peatland soils, new more sustainable forms of land use must be developed on the affected areas.

Regulation proposal:

The aim of almost complete re-wetting of the organic soils currently used for agricultural (peatlands and mires) by 2045 is politically established. There will be a gradual transition process that will begin with positive incentives and voluntary participation. However, in the medium- and long-term, peatland conservation will be compulsory through emission pricing and planning instruments. There will also be greater investment in creating economic options for "wet use" (photovoltaics, paludiculture). Financial incentives in the initial phase will make use of a national peatland conservation fund or the Joint Task for the Improvement of Agricultural Structures and Coastal Protection. Through the peatlands conservation strategy, the targets will be adapted to different regional conditions, funding secured, the institutional basis for peatland conservation strengthened and data collection improved. The peatland conservation strategy will include a package of measures with incentive systems as well as planning and regulatory components.

Explanation:

The rewetting of peatland currently used for agriculture is a long-term task for the whole of society that requires clear aims and cooperation with land owners, residents and users of peatland areas. A staged and long-term strategy with clear communication of the aims is important to: 1. be credible in terms of climate policy; 2. prevent further bad investments; provide incentives for research and development on the wet utilization of organic soils as well as

utilization of suitable biomass; allow adequate time for agricultural adaptation and 5. have enough time for the staged use of instruments that will clearly benefit those "pioneers" who respond quickly. This is necessary for the acceptance of rewetting in the affected areas.

One important aspect of the discussion about the economic prospects of the affected areas relates to the options for the "wet use" of restored peatlands. Up until now, methods for a "wet agriculture", what is known as paludiculture (for example sphagnum moss, reeds, reedmace and alders), have been at the forefront. They could become increasingly interesting economically in future in view of new options for using these materials (building materials, insulation). However, considerable investment in research and development of "wet agriculture" is necessary as well as in processing structures and a corresponding cluster formation.

These areas can also be used for generating renewable energies, especially photovoltaics (cf. Item 14).

The proposal is based on:

Grethe, Harald et al. (2021): *Klimaschutz im Agrar- und Ernährungssystem Deutschlands: Die drei zentralen Handlungsfelder auf dem Weg zur Klimaneutralität*. Expert report on behalf of the Stiftung Klimaneutralität.

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