



Federal Ministry
of Finance

Green bond allocation report 2022

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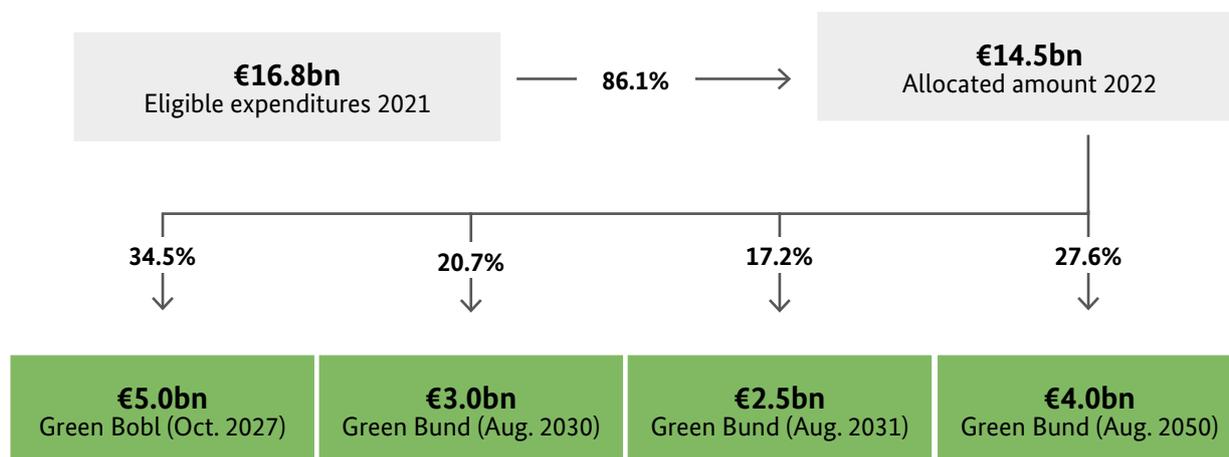
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Summary – Green bond allocation report 2022

This allocation report provides an overview of how an amount equal to the proceeds from the Green German Federal securities newly issued or reopened in 2022 has been fully allocated to “eligible green expenditures”, as defined in the Green Bond Framework of 24 August 2020, from the 2021 federal budget. These eligible green expenditures (i.e. expenditures that qualify as green) amount to around €16.8bn, of which €14.5bn were taken into account for the federal government’s green issuances in 2022 and proportionately allocated to the four securities.



Overview of the 2022 allocation

Table 1: 2022 allocation

Sector (as listed in the Green Bond Framework)	Eligible expenditures (2021)	Allocated amount	Green Bobl (Oct. 2027)	Green Bund (Aug. 2030)	Green Bund (Aug. 2031)	Green Bund (Aug. 2050)
in € million						
Transport	8,344.1	7,185.8	2,477.8	1,486.7	1,238.9	1,982.3
International cooperation	3,701.0	3,187.2	1,099.0	659.4	549.5	879.2
Research, innovation and awareness raising	1,359.8	1,171.0	403.8	242.3	201.9	323.0
Energy and industry	2,665.5	2,295.5	791.5	474.9	395.8	633.2
Agriculture, forestry, natural landscapes and biodiversity	767.0	660.5	227.8	136.7	113.9	182.2
Total	16,837.4	14,500.0	5,000.0	3,000.0	2,500.0	4,000.0

Figures are rounded

50%	About half of the 2022 issuance volume is earmarked for the maintenance and development of the transport sector, particularly for Germany's high-quality rail network , underscoring the government's efforts to make passenger and freight transport greener and more environmentally friendly. The development and use of alternative fuels, drive technologies and their infrastructures as well as public transport are also funded.
22%	Germany supports emerging and developing countries in their efforts to achieve more environmentally sustainable economies. This is reflected in the fact that international cooperation accounts for a significant proportion of the allocated green expenditures. A key area is bilateral financial cooperation to support medium and long-term investments in German development cooperation partner countries.
8%	To support the transition to a sustainable economy, green expenditures on research, innovation and awareness raising make up an important part of the federal budget. The expenditures are found partly in this sector (8% of the eligible expenditures) and partly in the other four sectors (if there is a clear connection to the respective sector). Taken together, they account for 14% (about €2.3bn) of the total allocated expenditures. The priorities in this sector are research for sustainability as well as the research areas of aerospace, energy, transport and digitalisation.
16%	Germany is steadily and reliably expanding the use of renewable energy to achieve the objectives of the Federal Climate Action Act (<i>Bundes-Klimaschutzgesetz</i>). Energy efficiency is to be increased in the energy industry itself as well as in the buildings sector and energy-intensive industries.
5%	In order to advance climate action and adaptation to climate change, the German government supports projects for sustainable agriculture and forestry, coastal and flood protection as well as the conservation of natural habitats and biodiversity .

1. Overview of the 2022 issuances

In 2022, the Federal Republic of Germany issued Green German Federal securities with a total volume of €14.5bn. Three previously issued Green Federal bonds were reopened, and a Green Federal note was newly issued.¹ This has both extended the green Bund curve with its already fifth maturity point (October 2027) and boosted the liquidity of outstanding green bonds through large reopenings.

New issue of five-year Green Federal note maturing on 15 October 2027 (ISIN: DE0001030740)

The five-year Green Federal note maturing on 15 October 2027 was newly issued on 31 August 2022 with an issuance volume of €5bn. The yield spread (“greenium”) against its conventional twin² as fixed in the syndication process was 1.25 basis points.

Reopening of 10-year Green Federal bond maturing on 15 August 2030 (ISIN: DE0001030708)

The 10-year Green Federal bond maturing on 15 August 2030 was tapped by €1.5bn on 2 March 2022 and by the same amount on 20 July 2022 to a total volume of €9.5bn. In the first reopening, the “greenium” was around 4.5 basis points, and in the second reopening just under 1.1 basis points.

Reopening of 10-year Green Federal bond maturing on 15 August 2031 (ISIN: DE0001030732)

The 10-year Green Federal bond maturing on 15 August 2031 was tapped by €1.5bn on 4 May 2022 and by €1bn on 2 November 2022 to a total volume of €9bn. The “greenium” in the first auction was roughly 2.2 basis points, and in the second auction roughly 0.6 basis points.

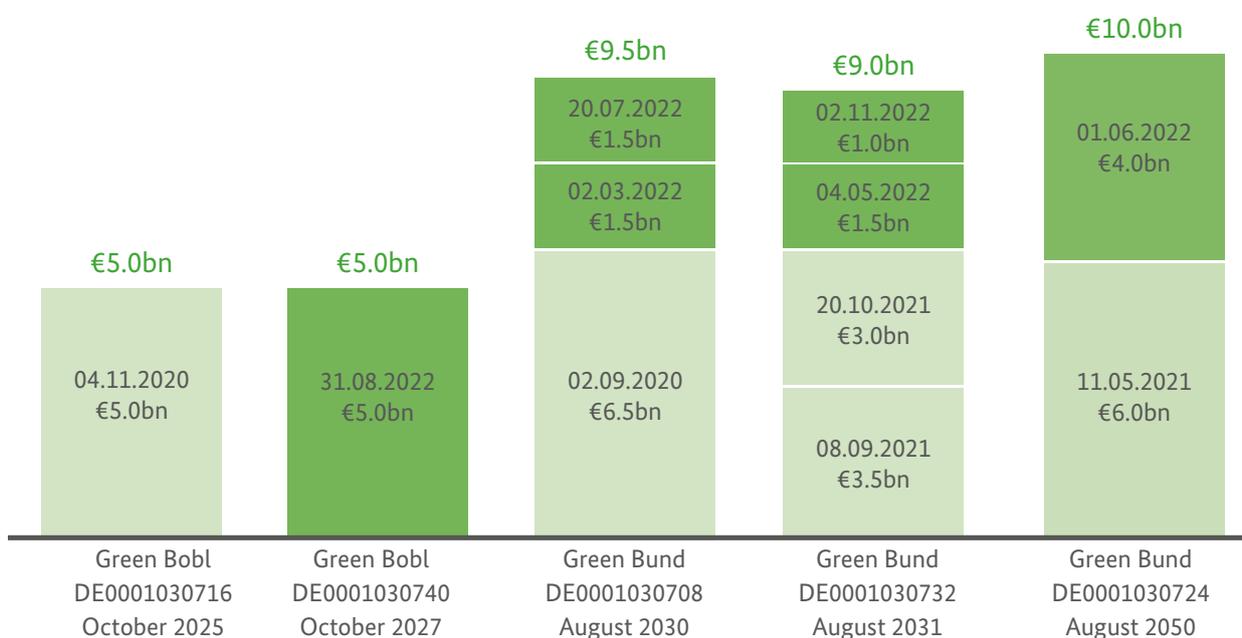
Reopening of 30-year Green Federal bond maturing on 15 August 2050 (ISIN: DE0001030724)

The 30-year Green Federal bond maturing on 15 August 2050 was tapped by €4bn on 1 June 2022 to a total volume of €10bn. The “greenium” was fixed in the syndication process at two basis points.

1 You can find further information on the 2022 issuances at <https://www.deutsche-finanzagentur.de/en/federal-securities/types-of-federal-securities/green-federal-securities/issuance>.

2 The Federal Republic of Germany always issues its green bonds with an identical maturity and identical coupon to an existing conventional federal security. Further information on this twin bond approach can be found on the website <https://www.deutsche-finanzagentur.de/en/federal-securities/types-of-federal-securities/green-federal-securities/twin-bond-concept>.

Figure 1: Time of issuance and outstanding volume of Green German Federal securities at the end of 2022.
(The darker green denotes the securities that were newly issued or reopened in 2022.)



2. Green expenditures

The innovative concept of Green German Federal securities supports the development of the green bonds market and increases the transparency of green spending by the German government. The twin bond approach is explained in detail in the Green Bond Framework.³

2.1 Certainty and regularity

In accordance with the German government's approach, the proceeds from bond issuances in any given year are always allocated exclusively to expenditures in the previous year. The proceeds from the Green German Federal securities issued in 2022 are therefore allocated entirely to eligible

expenditures from the 2021 federal budget (including the Energy and Climate Fund⁴).

Allocating proceeds exclusively to already incurred expenditures guarantees the budgetary sovereignty of the German Bundestag and at the same time provides investors with transparency at an early stage and gives them assurance that the funds are being used appropriately.

³ https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/GreenBondFramework_2020_en.pdf

⁴ With the entry into force of the Second Act Amending the Act Establishing a Special Energy and Climate Fund on 22 July 2022, the designation of the special fund was changed to "Climate and Transformation Fund" (see Federal Gazette 2022 part I no 26 of 21 July 2022). For the purposes of the 2022 allocation report, the designation from the financial year 2021 is used.

The independent Bundesrechnungshof (Germany's supreme audit institution)⁵ audited the 2021 federal budget. It did not find any discrepancies between the revenues and expenditures listed in the accounts and those in the underlying records. The Bundesrechnungshof used a mathematical statistical method to verify to what extent the revenues and expenditures in the federal budget had been accurately recorded. In its 2022 annual report, the Bundesrechnungshof did not address whether or not expenditures can be defined as "green".⁶

2.2 Selection of eligible green expenditures

Eligible green expenditures – hereafter referred to as "eligible expenditures" – are expenditures from all areas of the federal budget that support the overall climate and sustainability targets set out in the Green Bond Framework. The expenditures can relate to tangible assets such as infrastructure, buildings, landscapes and forests, but also to intangible assets such as individual and institutional competencies, research, innovation and scientific findings. In cases in which the federal government supports *Länder* and local authority programmes (co-financing), only the Federation's share is taken into account and allocated.

The selection of eligible expenditures is made in accordance with the key objectives of Germany's climate action policies. The eligible expenditures are also mapped to the six environmental objectives of the EU taxonomy for environmentally

sustainable economic activities.⁷ The mapping of eligible expenditures with the United Nations' 17 Sustainable Development Goals (SDGs) is set out in the Green Bond Framework. Furthermore, a second party opinion (SPO⁸) validated the Framework's alignment with best practices in the market and the significant contribution being made to the relevant UN Sustainable Development goals.

The eligible expenditures were selected from the 2021 federal budget by the Core Green Bond Team chaired by the Federal Ministry of Finance in cooperation with the responsible federal ministries. The Green Bond Principles of the International Capital Market Association (ICMA) served as the basis for the selection of eligible expenditures.⁹ The selection was made on the basis of currently available information, in particular with regard to the objectives of the spending programmes. Documentation of existing federal expenditures is publicly available.¹⁰ Possible impacts will be transparently presented in the separate 2022 impact report. In accordance with the Green Bond Framework, impact reports are generally available one to three years after the respective issuance.

Control mechanisms and safeguards have been set up for every category of expenditure in accordance with European and national legislation and standards, e.g. the Federal Government Directive Concerning the Prevention of Corruption in the Federal Administration (*Richtlinie der Bundesregierung zur Korruptionsprävention in der*

5 The Bundesrechnungshof audits the accounts and determines whether public finances have been properly and efficiently administered by the federal government (Article 114 of the Basic Law (*Grundgesetz*)). The Bundesrechnungshof is a supreme federal authority. As an independent financial control body it is subject only to the law.

6 https://www.bundesrechnungshof.de/SharedDocs/Kurzmeldungen/DE/-2022-Kurzmeldungen/-11-2022_bemerkungen/11-2022-bemerkung2022.html

7 See Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088. Allocations were made in accordance with the objectives set out in Article 9 of the above-mentioned Regulation.

8 https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/SPO.pdf

9 <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp/>

10 <https://www.bundeshaushalt.de>

Bundesverwaltung).¹¹ In the area of economic cooperation and development, these safeguards are supplemented by the Federal Ministry for Economic Cooperation and Development's binding Strategy Paper on Anti-Corruption and Integrity in German Development Policy.¹² In order to mitigate the risk of modern slavery and child labour and to strengthen human rights in developing countries, social safeguards in accordance with European and national legislation and standards apply to every expenditure category. These include the Federal Ministry for Economic Cooperation and Development's concept "Human Rights in German Development Policy", which sets binding guidelines for the design of programme proposals for bilateral German technical and financial cooperation.¹³

The Core Green Bond Team identified approximately €16.8bn of eligible expenditures in the 2021 federal budget. The expenditures were examined by the following federal ministries within their respective remits. The names and responsibilities of the ministries correspond to the structure of the ministries in the 2021 financial year¹⁴:

- Federal Ministry for Economic Affairs and Energy (BMWi)
- Federal Ministry of Food and Agriculture (BMEL)
- Federal Ministry of Transport and Digital Infrastructure (BMVI)
- Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)

- Federal Ministry of Education and Research (BMBF)
- Federal Ministry for Economic Cooperation and Development (BMZ)

An interministerial working group chaired by the Federal Ministry of Finance (BMF) confirmed the selection of eligible expenditures.

The eligible expenditures also include measures that are financed by the Energy and Climate Fund (*Energie- und Klimafonds*, EKF). This special fund makes a significant contribution to implementing Germany's *Energiewende*, or transition to a low-carbon economy. Many of the climate action projects funded by the Energy and Climate Fund are embedded in measures that are implemented by various ministries.

Federal budgetary expenditures for which grants from the EU recovery instrument "Next Generation EU" are provided under the German Reconstruction and Resilience Plan (DARP) were excluded as eligible expenditures for Green German Federal securities.

11 Federal Government Directive Concerning the Prevention of Corruption in the Federal Administration (*Richtlinie der Bundesregierung zur Korruptionsprävention in der Bundesverwaltung*), http://www.verwaltungsvorschriften-im-internet.de/bsvwvbund_30072004_O4634140151.htm

12 <https://www.bmz.de/resource/blob/23488/6670408c26037dcf69ef5aefcfe87d60/strategiepapier318-4-2012-data.pdf>

13 <https://www.bmz.de/en/ministry/working-approach/bilateral-development-cooperation-56630>

14 Official order of the ministries pursuant to the announcement of the formation of the government on 14 March 2018 in the Federal Gazette of 16 March 2018: <https://www.bundesanzeiger.de/pub/publication/OfWcxTATaMQbtpe55z?0>

3. Allocation of proceeds from the 2022 issuances

Eligible expenditures 2021	€16,837,400,000.00
Issuance volume 2022	€14,500,000,000.00

The issuance volume of Green German Federal securities in 2022 amounts to €14.5bn. The allocation overall as well as at the level of the individual budget items is proportionate to the volume of eligible expenditures in 2021.

The 2021 eligible expenditures amount to €16.8374bn. As illustrated below, they are distributed among the five sectors of the Green Bond Framework and mapped to the six environmental objectives of the EU taxonomy for environmentally sustainable economic activities.¹⁵

In 2022, around 86.1% of the 2021 eligible expenditures were used for the allocation. Table 2 shows the allocated amounts by sector, in the order they are presented in the Green Bond Framework. The following sub-chapters describe the sectors more closely and provide detailed overviews of all 93 expenditure items in the 2021 federal budget in which eligible expenditures were identified. In tables 2 to 12 the eligible expenditures are given as exact amounts, while the allocated amounts are rounded. The allocation is made on the basis of the above-mentioned proportional distribution.

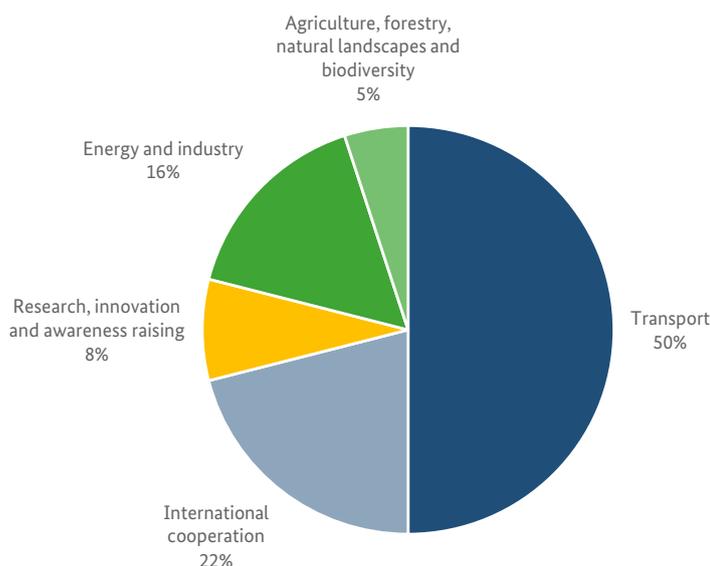


Figure 2: Breakdown by sector

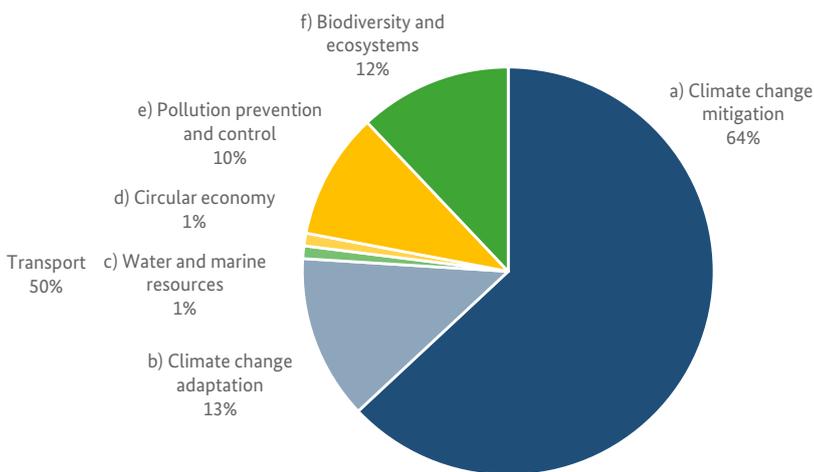


Figure 3: Breakdown in accordance with the EU's environmental objectives (as listed in Article 9 of the EU Taxonomy – see footnote 7)

¹⁵ See footnote 7.

Table 2: Breakdown of 2021 eligible expenditures by sector

Sectors	Eligible expenditures	Allocated amount	Number of budget items
	in € million		
Transport	8,344.1	7,185.8	25
International cooperation	3,701.0	3,187.2	14
Research, innovation and awareness raising	1,359.8	1,171.0	20
Energy and industry	2,665.5	2,295.5	10
Agriculture, forestry, natural landscapes and biodiversity	767.0	660.5	24
Total	16,837.4	14,500.0	93

The composition of the allocated expenditures is identical for the issuance volumes of all Green German Federal securities issued in 2022. The expenditures are allocated to the four securities proportionately and in relation to the issue volumes in the amounts of €5.0bn (five-year Green Federal note maturing in October 2027), €3.0bn (10-year Green Federal bond maturing in August 2030), €2.5bn (10-year Green Federal bond maturing in August 2031) and €4.0bn (30-year Green Federal bond maturing in August 2050), respectively.

The allocation set out in this report completes the allocation of the eligible expenditures from the 2021 budget. The non-allocated 13.9% of eligible expenditures in each budget item will not be used for issuances of Green German Federal securities in other years.¹⁶

3.1 Transport

In 2021, the transport sector was responsible for 19% of Germany's greenhouse gas emissions, in particular from road transport.¹⁷ It is therefore essential that the transport sector contributes to achieving Germany's climate action targets. To this end, the German government has adopted extensive measures to decarbonise passenger and freight transport and to make it more environmentally friendly. The proceeds from the Green German Federal securities issued in 2022 were allocated to 2021 expenditures in the following areas of the transport sector:

■ Rail transport

Rail transport and rail infrastructure have a crucial part to play in achieving Germany's climate targets. In particular, transport needs to be shifted from road to rail and the electrification of drive systems and rail routes needs to be expanded to achieve decarbonisation.

To this end, the federal government is providing investment subsidies for rail construction and expansion projects and for the maintenance of the high-quality rail infrastructure throughout the country. In 2021, federal subsidies for rail infrastructure totalled over €6.7bn (see budget items 1, 3 and 6 in table 4). For example, a project in

¹⁶ For all issuances in a given calendar year (regardless of whether they are new issuances or reopenings of Green German Federal securities), only the eligible expenditures from the previous year's federal budget are relevant. In accordance with section 4.3 of the Green Bond Framework, the issuance volume of a tap – regardless of the year of the first issuance of the security – is treated like a new issuance in terms of (a) allocation of the proceeds and (b) reporting.

¹⁷ The German government's 2022 Climate Action Report (available in German only): <https://www.bmwk.de/Redaktion/DE/Downloads/Energie/klimaschutzbericht.html>

Table 3: Breakdown of 2021 eligible expenditures in the transport sector by category

Transport Category	Eligible expenditures in € million	Allocated amount	Share of the allocation within the sector	Number of budget items
Rail transport	7,372.7	6,349.2	88.4%	8
Alternative drive systems and fuels	259.1	223.1	3.1%	4
Public transport	386.2	332.6	4.6%	4
Waterways	197.5	170.1	2.4%	2
Cycling	128.6	110.7	1.5%	7
Transport – Total	8,344.1	7,185.8	100%	25

Baden-Württemberg to upgrade and electrify an important rail route for commuters and leisure travellers between Ulm and Lindau was completed in 2021.¹⁸

The federal government is also reducing charges for track access and the use of rail infrastructure facilities for freight rail operators and is supporting investments in construction and expansion projects, the reactivation and replacement of sidings and multifunctional infrastructure facilities, and in main and feeder lines used by industry for road/rail transloading. The aim of the measures is to improve the efficiency of rail freight transport and to reduce costs (e.g. by reducing processing and waiting times and optimising resource utilisation). The federal government also supports combined transport.¹⁹

Government funding contributes to more shipments being made using multiple modes of transport and thereby to a reduction in road transport.

Alternative drive systems and fuels

The electrification of road transport, in particular, is essential for reaching Germany’s climate targets. Funding is being provided for the development and use of alternative fuels²⁰ and drive systems, as well as their infrastructures, so that all modes of transport can contribute to achieving this goal. Alongside direct funding for refuelling and charging infrastructures for alternative fuels, market activation grants support the retrofitting and conversion of vehicles for alternative fuel use. Within the framework of a programme to promote research, development and pilot projects, existing projects are being continued and new measures driven forward.

Hydrogen and fuel cells are a valuable addition to battery powered vehicles in the transport sector. With the “National Innovation Programme on Hydrogen and Fuel Cell Technology” (NIP), the Federal Ministry for Transport and Digital Infrastructure funds research and development (R&D) measures and, through investment subsidies, supports the market activation of these technologies in the transport sector. The use of green hydrogen in fuel cell vehicles would enable all modes of transport to

18 Case study 1 in the 2022 Green Bond Investor Presentation, slide 35: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf

19 Combined transport is a special form of freight transport whereby loading units (containers, swap bodies or semi-trailers) are transported over longer distances by rail or via waterways. Heavy goods vehicles are used only for the shortest possible legs of the journey, to transport loading units to a combined transport transloading site or to pick them up from a transloading site and deliver them to the final destination.

20 Pursuant to the EU Directive 2014/94/EU on the deployment of alternative fuels infrastructure, alternative fuels serve, at least partly, as a substitute for fossil oil sources in the energy supply to transport and contribute to decarbonisation. Besides electricity and hydrogen, alternative fuels can include LNG and CNG, ideally from renewable sources. The area of electric mobility has received additional funding from measures co-financed by the German Recovery and Resilience Plan (DARF). These measures are excluded as eligible expenditures for Green German Federal securities.

become completely carbon-free. The NIP measures encompass the use of fuel cells and hydrogen in road, rail, water and air transport as well as in specialist applications.

■ Public transport

Due to its energy efficiency and high degree of electrification, public transport produces significantly less greenhouse gas emissions per passenger kilometre than private motorised transport. A modal shift could therefore reduce the greenhouse gas emissions produced by the transport sector. This calls for an attractive and user-friendly public transport system. However, a modal shift from private motorised transport to public transport not only has the aim of reducing greenhouse gas emissions, it also has an important role to play in making cities and communities more eco-friendly.²¹ The use of alternative drive systems in public transport will also accelerate decarbonisation. Since regional and local public transport falls within the scope of responsibility of the *Länder* and local authorities, the federal government provides indirect support in the form of financial assistance.

The funding programme “Digitalisation of Local Authority Transport Systems” (*Digitalisierung kommunaler Verkehrssysteme*) will support the digitalisation of local mobility in order to reduce emissions and strengthen ecomobility. The aim is to mitigate air pollution as well as reduce greenhouse gas emissions.²²

■ Waterways

By funding replacement, extension and construction projects on Germany’s waterways as well as measures to maintain the existing transport infrastructure, the federal government is laying the foundation for the use of waterways for transportation and supporting sustainable inland navigation. As an efficient and effective alternative to heavy goods vehicles, the port-ship-waterway system could contribute to more goods being transported by inland waterway and at the same time take the pressure off roads, thereby reducing the emission of greenhouse gases, NO_x and particulate matter. Mitigation and replacement measures constitute eligible expenditures. Measures include the improvement of ecological status of habitats, creating shallow water zones and restoration of riparian vegetation, as well as infrastructure measures such as flattening riverbanks and widening bends, creating retention areas, and flood protection measures.

■ Cycling

The federal government supports cycling in Germany with (a) measures to implement the National Cycling Plan²³, (b) investment funding for pilot projects in the area of cycling and for fast cycle routes whose construction falls under the remit of the *Länder*, local authorities and associations of local authorities, (c) subsidies for the expansion of Germany’s network of cycling routes and (d) financial assistance to the *Länder* to enable investments in cycling. Furthermore, the construction and maintenance of cycle paths on federal roads are financed through the federal budget.

21 Case study 2 in the 2022 Green Bond Investor Presentation, slide 36: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf

22 <https://bmdv.bund.de/SharedDocs/DE/Artikel/G/digitalisierung-kommunaler-verkehrssysteme.html> (in German only)

23 Case study 3 in the 2022 Green Bond Investor Presentation, slide 37: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf

Table 4: Breakdown of 2021 eligible expenditures in the transport sector by category and budget item and by allocation of expenditures to proceeds of the green bond issuances

Responsible ministry	Budget chapter	Budget item	Name of the budget item	Eligible expenditures	Allocated to Green Bobl (Oct. 2027)	Allocated to Green Bund (Aug. 2030)	Allocated to Green Bund (Aug. 2031)	Allocated to Green Bund (Aug. 2050)
in € million								
1. Rail transport								
BMVI	1202	891 01	Construction cost subsidies for investments in the expansion of the federal rail infrastructure	2,045.0	607.3	364.4	303.6	485.8
BMVI	1202	891 05	Measures to reduce noise pollution from existing federal railways	185.5	55.1	33.1	27.5	44.1
BMVI	1202	891 11	Construction cost subsidies for maintaining the federal rail infrastructure	4,642.5	1,378.6	827.2	689.3	1,102.9
BMVI	1210	682 51	Reducing infrastructure facility charges in rail freight transport	76.1	22.6	13.6	11.3	18.1
BMVI	1210	682 52	Reduction in track access charges in rail freight transport	344.0	102.2	61.3	51.1	81.7
BMVI	1210	891 51	Construction cost subsidies for investments in the non-federal rail infrastructure	32.6	9.7	5.8	4.8	7.7
BMVI	1210	892 41	Subsidies to private companies for investments in combined transport	31.3	9.3	5.6	4.6	7.4
BMVI	1210	892 42	Investment subsidies to private companies to fund the construction, expansion, reactivation and replacement of sidings and other rail freight facilities	15.7	4.7	2.8	2.3	3.7
				7,372.7	2,189.4	1,313.6	1,094.7	1,751.5
2. Alternative drive systems and fuels								
BMVI	1210	686 61	Subsidies for research, development and pilot projects for the market activation of alternative fuel use and the establishment of a corresponding filling and charging infrastructure	5.2	1.5	0.9	0.8	1.2
BMVI	1210	892 03	National Hydrogen and Fuel Cell Technology Innovation Programme (NIP) 2016–2026	66.1	19.6	11.8	9.8	15.7
BMWf (EKF)	6092	683 04	Measures for the expansion of electric mobility	90.0	26.7	16.0	13.4	21.4
BMBF (EKF)				61.5	18.3	11.0	9.1	14.6
BMU (EKF)				30.7	9.1	5.5	4.6	7.3
BMVI (EKF)	6092	893 02	Subsidies for the construction of filling and charging infrastructure	5.6	1.7	1.0	0.8	1.3
				259.1	76.9	46.2	38.5	61.6

Table 4: continued

Responsible ministry	Budget chapter	Budget item	Name of the budget item	Eligible expenditures	Allocated to Green Bobl (Oct. 2027)	Allocated to Green Bund (Aug. 2030)	Allocated to Green Bund (Aug. 2031)	Allocated to Green Bund (Aug. 2050)
in € million								
3. Public transport								
BMVI	1206	882 02	Financial assistance to the <i>Länder</i> for rail-bound local public transport infrastructure	215.5	64.0	38.4	32.0	51.2
BMVI	1206	891 01	Investment subsidies for major public transport projects to Deutsche Bahn AG and companies majority-owned by the federal government	56.3	16.7	10.0	8.4	13.4
BMVI	1210	883 81	Measures to digitalise local authority transport systems	95.6	28.4	17.0	14.2	22.7
BMVI (EKF)	6092	633 01	Local-authority public transport pilot projects from 2018 to 2021 to complement the "Immediate Action Programme for Clean Air"	18.8	5.6	3.3	2.8	4.5
				386.2	114.7	68.8	57.3	91.7
4. Waterways								
BMVI	1203	780 01	Maintenance of transport infrastructure	66.4	19.7	11.8	9.9	15.8
BMVI	1203	780 02	Replacement, extension and construction projects relating to federal waterways	131.1	38.9	23.4	19.5	31.1
				197.5	58.6	35.2	29.3	46.9
5. Cycling								
BMVI	1201	746 22	Construction of bike lanes including maintenance (federal highways)	99.2	29.5	17.7	14.7	23.6
BMVI	1210	632 91	Implementation of the National Cycling Plan – grants to <i>Länder</i> and other public-law entities	13.6	4.0	2.4	2.0	3.2
		686 91	Implementation of the National Cycling Plan – subsidies to companies under private law					
		882 91	Grants to <i>Länder</i> for the construction of cycle highways					
		891 91	Funding of pilot projects in the area of cycling – subsidies to <i>Länder</i> and other public-law entities					
		891 92	Subsidies for the expansion of Germany's network of cycle routes (<i>Radnetz Deutschland</i>)					
BMVI	1210	882 92	Financial assistance to the <i>Länder</i> for investments in cycling through the special programme "Stadt und Land"	15.8	4.7	2.8	2.3	3.8
				128.6	38.2	22.9	19.1	30.6
Transport – Total				8,344.1	2,477.8	1,486.7	1,238.9	1,982.3

3.2 International cooperation for environmentally sustainable economies

Global challenges such as climate change require global solutions. Germany is highly committed to sustainable development in the context of international cooperation, and assists emerging and developing countries in their transition towards more environmentally sustainable economies and societies. Germany acts in accordance with the United Nations' Sustainable Development Goals, the Paris Agreement and other relevant international agreements and initiatives. Key areas of focus are:

- Climate change mitigation and adaptation
- Transitioning to low-emission, sustainable energy systems
- Improving energy efficiency in production and buildings
- Protecting natural habitats and biodiversity
- The sustainable use of natural resources and energy, including the development of sustainable agriculture and installations for producing renewable energy

Germany also works together with other industrialised countries to jointly accelerate the pace of the energy transition and leverage the potential for innovation and sustainable growth. Examples include energy partnerships and energy dialogues between the German government and countries such as Australia, Japan and the United States, which focus on discussions and cooperation on energy issues.

Germany supports 65 partner countries in the area of bilateral development cooperation (see the BMZ 2030 reform strategy²⁴). The selection of partner countries for future bilateral cooperation is based on global indicators such as good governance, anti-corruption measures and level of need. The selection and approval of specific projects is subject, among other things, to German law, the "Guidelines for bilateral financial and technical cooperation with cooperation partners of German development cooperation"²⁵ and the relevant international agreements and treaties signed by Germany.

International assistance is reported in accordance with internationally agreed guidelines, criteria and reporting cycles, either as official development assistance (ODA) to the OECD Development Assistance Committee (DAC)²⁶ and/or as climate finance under the United Nations Framework Convention on Climate Change (UNFCCC), and to the EU.

²⁴ The reform strategy BMZ 2030 was published in April 2020 and is available online (in German only) at: <https://www.bmz.de/de/themen/reformkonzept-bmz-2030>. The list of countries is regularly updated on the website of the Federal Ministry for Economic Cooperation and Development under <https://www.bmz.de/de/laender>

²⁵ <https://www.bundesregierung.de/breg-de/service/publikationen/leitlinien-fuer-die-bi-laterale-finanzielle-und-tech-nische-zu-sammen-arbeit-mit-ko-operations-partnern-der-deutschen-entwicklungs-zusammenarbeit-1939382>

²⁶ The objective of the Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and Development (OECD) is to improve development cooperation qualitatively and quantitatively. See also: <https://www.oecd.org/dac/>

Table 5: Breakdown of 2021 eligible expenditures in the international cooperation sector by category

International cooperation	Eligible expenditures	Allocated amount	Share of allocation within the sector	Number of budget items
Category	in € million			
Bilateral financial cooperation	1,187.8	1,022.9	32.1%	3
Bilateral technical cooperation	771.9	664.7	20.9%	1
International climate and environmental protection	663.2	571.1	17.9%	3
Multilateral cooperation	764.5	658.4	20.7%	2
Specific funding	313.6	270.1	8.5%	5
International cooperation – Total	3,701.0	3,187.2	100.0%	14

■ Bilateral financial cooperation

The main aim of bilateral financial cooperation is to support medium- and long-term investments in partner countries with which Germany engages in development cooperation. The financial cooperation projects are implemented by the Kreditanstalt für Wiederaufbau (KfW).²⁷

Disbursements in the context of bilateral financial cooperation are deemed to be eligible expenditures if they contribute to climate change adaptation, climate change mitigation, environmental and resource protection and/or to supporting biodiversity. The methodology used to allocate projects is based on the methodology of the OECD Development Assistance Committee. Supported projects include renewable energy plants²⁸, energy-efficient buildings, access to green energy for households and for micro-, small and medium-sized enterprises, the promotion of low-carbon transport²⁹, the creation of protected areas for biodiversity, and clean urban infrastructure. Financial cooperation projects are generally carried out in collaboration with the governments of the partner countries.

27 As they are funded by the federal budget, these projects aren't taken into account for KfW's own green bonds.

28 Case study 4 in the 2022 Green Bond Investor Presentation, Power Plant Albania, slide 38: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf

29 Case studies 5 and 6 in the 2022 Green Bond Investor Presentation, slides 39 and 40: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf

■ Bilateral technical cooperation

In the context of bilateral technical cooperation projects, the German government helps people and organisations in partner countries improve their technical, economic and organisational skills and knowledge and supports them in achieving their national climate and environmental objectives through a more effective, efficient and sustainable use of resources. Bilateral technical cooperation consists mainly of assistance and advice provided by experts (e.g. at government agencies or other organisations in the partner countries), financing and consultation services and the limited provision and financing of materials and equipment. Most technical cooperation projects are implemented by the German government's development agency Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).³⁰

In some cases, bilateral technical cooperation projects are carried out directly by the German government or government agencies, in particular the Federal Institute for Geosciences and Natural Resources (*Bundesanstalt für Geowissenschaften und Rohstoffe*) and the National Metrology Institute (*Physikalisch-Technische Bundesanstalt*).

30 Case studies 8 and 9 in the 2022 Green Bond Investor Presentation, slides 42 and 43: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf

As is the case for bilateral financial cooperation, disbursements in this area are deemed to be eligible expenditures if they contribute to climate change adaptation, climate change mitigation, to environmental and resource protection and/or to supporting biodiversity. The allocation of projects is – as described above – based on the methodology of the OECD Development Assistance Committee. Funded technical cooperation projects include supporting climate adaptation in rural areas, sustainable water infrastructure and, as in the “South-African German Energy Programme” (SAGEN), framework conditions for the development of renewable energy. In the SAGEN programme implemented by GIZ, the national electricity supplier and municipal distribution companies in South Africa are advised on how to integrate renewable energy into the grid and selected municipalities are given support in the implementation of energy efficiency measures.³¹

International climate and environmental protection

The International Climate Initiative (*Internationale Klimaschutzinitiative, IKI*) is an instrument used by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety to provide international support for climate action and biodiversity. It is used to fund a wide range of projects that help developing and emerging countries to reduce greenhouse gas emissions across different sectors, to adapt to the consequences of climate change, to maintain or establish the natural reduction of carbon emissions with the help of forests, swamps and grasslands, and to protect and restore ecosystems

and biodiversity.³² The aim is to help individual UNFCCC members achieve their nationally determined contributions (NDCs) to the Paris Agreement’s climate targets and at the same time to encourage them to formulate these more ambitiously. This involves not only knowledge transfer but also supporting the development of analytical tools (e.g. PACTA).

The funded projects to export technologies for tackling marine litter are intended to help prevent waste generation on land, directly at source where possible. The aim is to prevent plastic waste from leaking into rivers and oceans in the first place. This is why funding is provided to cooperation projects that use proven methods to reduce plastic waste in the medium term, or that establish waste management systems and circular economy solutions. Key funding criteria are that the chosen approaches can be multiplied, incorporated into existing systems and continued beyond the project duration.³³

The Federal Ministry for Economic Cooperation and Development’s budget item for international climate and environmental action finances new and especially innovative approaches in the area of climate action and adaptation to climate change in developing and emerging countries that contribute to implementing the Paris Agreement. The budget item is not limited to specific instruments. Funding can be provided to projects carried out by GIZ and KfW, private institutions, churches, political foundations and public authorities or to research projects.

31 Case study 7 in the 2022 Green Bond Investor Presentation, SAGEN, slide 41: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf

32 Further information on the projects, financing and investments that are supported by the International Climate Initiative can be found at www.international-climate-initiative.com. For information on the selection procedures visit https://www.international-climate-initiative.com/en/project-funding/information-for-recipients-of-project-funding/thematic-and-country-specific-selection?iki_lang=en

33 Case study 17 in the 2022 Green Bond Investor Presentation, slide 51: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf

■ Multilateral cooperation

Multilateral organisations implement major programmes with considerable scope in developing and emerging countries and coordinate the financial contributions from different donors. They play an important role in supporting transformation processes in the partner countries. That is why Germany contributes, through the Federal Ministry for Economic Cooperation and Development, to multilateral funds such as climate and environment funds. A large part of these funds is allocated to the Green Climate Fund (€200m), the Global Environment Facility (approx. €91m) and the Central African Forest Initiative (approx. €82m).

■ Specific funding

The Federal Ministry for Economic Affairs and Energy supports enterprises that want to develop foreign markets with a range of initiatives. With the goal of positioning German technology and know-how worldwide, the Export Initiative for Energy (*Exportinitiative Energie*) helps providers of climate-friendly energy solutions to break into new markets in around 100 countries. International knowledge transfer as well as advisory and training measures make it possible to combine the facilitation of foreign trade with development cooperation and climate action. The Export Initiative for Green Technologies (*Exportinitiative Umwelttechnologien*) supports small and medium-sized German enterprises that specialise in green technology products or related services to enter foreign markets. Key industries are waste and recycling management and sustainable water management, noise abatement and air pollution control, and sustainable mobility. The Africa Business Network (*Wirtschaftsnetzwerk Afrika*) provides enterprises that want to set up business operations in Africa with information on business conditions in African countries and advice and support on African market entry. It also offers additional measures to promote foreign trade.

Since 2016, the Environment Ministry's Export Initiative for Environmental Protection (*Exportinitiative Umweltschutz*) has been supporting projects by German companies and institutions that promote environmental awareness and that share environmental knowledge and technical know-how, especially in emerging and developing countries. Support is provided in particular to small and medium-sized enterprises providing public services (for example in the areas of circular economy, water and sewage treatment).³⁴

The special initiative "One World – No Hunger" finances projects that contribute to reducing hunger and malnutrition and that support rural development as an important precondition for food security. The eligible expenditures include projects aimed at environmentally sustainable use of natural resources and land, and that contribute to climate change adaptation.

The activities funded in the context of international energy partnerships include Germany's contribution to multilateral efforts as well as more than 20 bilateral energy partnerships between Germany and countries around the world. These combine regular high-level political dialogue with ongoing technical cooperation aimed at jointly accelerating the transition to sustainable, decarbonised energy systems.

³⁴ www.exportinitiative-umweltschutz.de.

Table 6: Breakdown of 2021 eligible expenditures in the international cooperation sector by category and budget item and by allocation of expenditures to proceeds of the green bond issuances

Responsible ministry	Budget chapter	Budget item	Name of the budget item	Eligible expenditures	Allocated to Green Bobl (Oct. 2027)	Allocated to Green Bund (Aug. 2030)	Allocated to Green Bund (Aug. 2031)	Allocated to Green Bund (Aug. 2050)
in € million								
1. Bilateral financial cooperation								
BMZ	2301	866 11	Bilateral financial cooperation – loans	118.7	35.2	21.1	17.6	28.2
BMZ	2301	896 01	Financial cooperation with regions	378.9	112.5	67.5	56.3	90.0
BMZ	2301	896 11	Bilateral financial cooperation – grants	690.2	205.0	123.0	102.5	164.0
				1,187.8	352.7	211.6	176.4	282.2
2. Bilateral technical cooperation								
BMZ	2301	896 03	Bilateral technical cooperation	771.9	229.2	137.5	114.6	183.4
				771.9	229.2	137.5	114.6	183.4
3. International climate and environmental protection								
BMU	1601	687 06	International climate and environmental protection – export of technologies to tackle marine litter	22.7	6.7	4.0	3.4	5.4
BMU	1602	896 05	Investments to protect the climate and biodiversity abroad	564.5	167.6	100.6	83.8	134.1
BMZ	2310	687 01	International climate and environmental protection	76.0	22.6	13.5	11.3	18.1
				663.2	196.9	118.2	98.5	157.6
4. Multilateral cooperation								
BMU	1601	687 01	Contributions to international organisations	23.4	6.9	4.2	3.5	5.6
BMZ	2303	896 09	Developmentally important multilateral aid for global environmental protection, biodiversity conservation and climate protection	741.1	220.1	132.0	110.0	176.1
				764.5	227.0	136.2	113.5	181.6
5. Specific funding								
BMWi	0904	687 05	Development of foreign markets	16.3	4.8	2.9	2.4	3.9
BMU	1601	687 04	Export of green and sustainable (environmental) infrastructure	10.7	3.2	1.9	1.6	2.5
BMU	1602	532 05	International cooperation [in the area of climate action]	25.3	7.5	4.5	3.8	6.0
BMZ	2310	896 31	Special Initiative ONE WORLD – No Hunger	232.0	68.9	41.3	34.4	55.1
BMWi (EKF)	6092	687 02	International energy cooperation, commodity partnerships and technological cooperation	29.3	8.7	5.2	4.4	7.0
				313.6	93.1	55.9	46.6	74.5
International cooperation – Total								
				3,701.0	1,099.0	659.4	549.5	879.2

3.3 Research, innovation and awareness raising

When it comes to fundamental developments of this kind, strong public-sector engagement in the area of research and innovation is essential for finding concrete, science-based solutions and for far-reaching knowledge and technology transfer. The German government has underscored its commitment to this sector with diverse and extensive federal spending on basic and applied research and on fostering innovation in the area of climate and environmental action.

If the eligible expenditures are clearly linked to a particular sector, research programmes are assigned directly to that sector in accordance with the Green Bond Framework. For example, the budget item “Energy research” is assigned to the sector “Energy and industry”. The eligible expenditures for research, innovation and awareness raising therefore amount to €2.3bn across all sectors (14% of the total eligible expenditures).

This sector’s eligible expenditures of €1.4bn are used in particular to develop solutions to combat climate change, curb greenhouse gas emissions, preserve ecosystems and protect natural resources. The project funding is aimed at creating conditions to enable the rapid advancement of promising ideas and innovations. These include projects for the sustainable conversion of energy systems³⁵, resource efficiency, material savings, strengthening the circular economy, decarbonising the transport sector and the sustainable development of cities and regions.

35 E.g. the Kopernikus project SynErgie, which is researching ways of offsetting fluctuations in power grids due to the increasing use of renewable energy sources to generate electricity. Case study 10 in the 2022 Green Bond Investor Presentation, slide 44: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf.

■ Research for sustainability

Research funding is based, among other things, on the implementation of the Research for Sustainability Strategy FONA³⁶, with which the Federal Ministry of Education and Research funds over 5,000 individual and collaborative projects:

- Every aspect of climate research is covered, from the development of effective models and databases to concrete risk prevention measures for regions, cities and local authorities, to new technologies and instruments for climate adaptation as well as for a climate-neutral economy and society – in Germany but also worldwide in the context of cooperation projects.
- Research into sustainable land usage is developing solutions to address conflicts between e.g. nature conservation, food and energy supply, demographic change and intensive land usage through settlement, transport and business.
- A variety of projects are funded in the area of bioeconomic research. These deal, for example, with sustainable agricultural systems of the future, innovative plant cultivation systems, and the transition to a circular economy, in particular to enable a more efficient use of biogenic resources for all application areas and sectors of the economy.
- Energy research, which is funded partly through the German government’s “Energy Research Programme” (*Energieforschungsprogramm*), is focused on developing sustainable energy systems in Germany. Here, key areas of focus are energy technologies, efficient energy use, green hydrogen, electricity grids and storage systems, industrial processes and sector coupling.

36 https://www.fona.de/en/fona-strategy/index_en.php

Table 7: 2021 eligible expenditures in the research, innovation and awareness raising sector

Research, innovation and awareness raising	Eligible expenditures	Allocated amount	Share of allocation within the sector	Number of budget items
Category	in € million			
Research for sustainability	579.8	499.3	42.6%	7
Environmental protection, nature conservation and climate change adaptation	105.4	90.8	7.8%	5
Aerospace, energy, transport and digitalisation	660.7	569.0	48.6%	5
Technology transfer lightweighting	13.9	12.0	1.0%	3
Research, innovation and awareness raising – Total	1,359.8	1,171.0	100.0%	20

- Under the umbrella of the research programme “MARE:N – Coastal, Marine and Polar Research for Sustainability”, research is being carried out into the role of the ocean and permafrost regions in climate processes; the effects of climate change on the polar regions; ocean currents and ocean resources; the environmental impact of microplastics in our oceans; and the conservation and use of our coastal regions against the background of society’s usage requirements, rising sea levels and extreme weather events.
- FONA also implements the funding priorities “resource efficient circular economy”, the programme “Wasser:N” and specific research and development activities related to sustainable land management, geological processes, natural hazards and Earth system science. New technologies such as digital applications for sustainable cities, a circular economy and energy supply are also funded. Expert advice and appropriate measures in the key areas of environmental technology and energy efficiency are helping to strengthen small and medium-sized businesses.³⁷
- Research into a resource-efficient circular economy also has the aim of reducing the use of valuable natural resources. Societal

transformation processes, and transformations geared towards sustainable development are a key element of social-ecological research projects.

Environmental protection, nature conservation and climate change adaptation

The “Environmental Innovation Programme” (*Umweltinnovationsprogramm*)³⁸ funds pilot projects focused on technologies and processes for preventing and mitigating pollution, and on the production and use of environmentally friendly products and substitute materials. Initiatives and organisations focusing on environmental protection and nature conservation are also supported with federal grants. With its funding programme “Measures to adapt to climate change” (*Maßnahmen zur Anpassung an den Klimawandel*), the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety funds projects that develop measures to tackle heat waves, flooding, extreme rainfall and other effects of global warming, and that support climate change adaptation. The funding programme was initiated as part of the German Strategy for Adaptation to Climate Change.³⁹

³⁷ https://www.bmbf.de/bmbf/de/forschung/innovativer-mittelstand/kmu-innovativ/kmu-innovativ_node.html

³⁸ <https://www.umweltinnovationsprogramm.de/?en=1>

³⁹ <https://www.bmuv.de/en/topics/climate-adaptation/climate-adaptation>

Aerospace, energy, transport and digitalisation

The “Maritime Research Programme” (*Maritimes Forschungsprogramm*)⁴⁰ provides strategic support to Germany’s maritime industry to help secure its technological leadership position and international competitiveness and to increase its ability to contribute to achieving Germany’s environmental policy goals. With the central idea of strengthening Germany’s maritime industry, the programme is making a significant contribution to achieving climate-neutral maritime shipping. Parts of the research programme are eligible expenditures: for example, under the funding priority “MARITIME.green”, innovative technologies are being developed in the areas of alternative fuels, energy systems, emission reduction and increased efficiency. This funding priority also covers research into ammonia, methanol and hydrogen as future maritime fuels, innovative energy management systems, and battery and fuel-cell-based energy systems.

Two satellite missions of the Federal Ministry for Economic Affairs and Energy’s Space and Innovation Programme are studying environmental and climate changes. EnMAP (Environmental Mapping and Analysis Programme) is a German earth observation satellite that provides data to support scientific research and applications in the areas of environment, agriculture, land usage, water management and geology on a global scale.⁴¹ The German-French small satellite mission MERLIN (Methane Remote Sensing LIDAR Mission) is a climate mission to observe the greenhouse gas methane in Earth’s atmosphere. Starting in 2028, MERLIN will detect and monitor methane in Earth’s atmosphere.⁴²

In its research fields of aerospace, energy, transport and digitalisation, the German Aerospace Center (DLR)⁴³ also conducts research into a range of topics that contribute to the German government’s climate goals. Examples include:

- Aviation: Climate research with impact assessments; eco-efficient production methods with circular economy methods; climate-efficient and climate-neutral fuels and drive systems; climate-optimised air traffic routing; designing ultra-efficient aircraft; noise reduction through optimised flight procedures, aircraft designs and technologies
- Aerospace: Earth observation satellites to quantify biomass and emissions (e.g. CO₂, methane); closing material cycles; emission prevention in space travel; green/new forms of fuel: future fuels; battery development in the DLReps project; solar panels with supercapacitors (HySeS); hydrogen handling, storage, tanks
- Energy: Solar and wind energy generation; green hydrogen and other synthetic sustainable fuels; energy storage and transportation⁴⁴; decarbonising industry⁴⁵; system analyses and sector coupling to optimise energy systems
- Transport and digitalisation Development of new mobility strategies focused on climate action and resource protection; decarbonising transport through the integration of new drive systems and renewable energy in vehicles and the transport system⁴⁶; digitalisation of

43 <https://www.dlr.de>

44 Case study 11 in the 2022 Green Bond Investor Presentation, slide 45: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf.

45 Case study 12 in the 2022 Green Bond Investor Presentation, slide 46: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf.

46 Case study 13 in the 2022 Green Bond Investor Presentation, slide 47: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf.

40 Funding announcement of 1 January 2018: https://www.bmwk.de/Redaktion/DE/Downloads/B/bekanntmachung-zur-foerderung-von-forschung-entwicklung-und-innovation.pdf?__blob=publicationFile&v=4

41 <http://www.enmap.org>

42 https://www.dlr.de/rd/desktopdefault.aspx/tabid-2440/3586_read-31672/

mobility through automation and “mobility as a service” concepts to protect resources and reduce land use.

In view of Germany’s ambitious climate goals, technological solutions for climate-neutral aircraft are urgently needed to make aviation more environmentally friendly by 2050. In addition to the advancements that have already been made, totally new, disruptive technologies are needed to address this huge challenge. Hydrogen as a source of energy is the starting point for the decarbonisation of all types of aircraft. It will enable new forms of propulsion such as fuel cells and hybrid systems. To compensate for the low energy content of hydrogen per volume, it is imperative to improve all aircraft subsystems, including aerodynamics, construction methods, lightweight design and all electronic systems. The technical challenges increase in proportion to the size of the aircraft. With funding from the Energy and Climate Fund the programme “Hybrid Electric Aviation” (*Hybridelektrisches Fliegen*) will focus in particular on advancing disruptive technologies that are associated with high development risks and bringing products to market as quickly as possible.

Technology transfer – lightweighting

The funding of research into lightweighting is aimed at improving resource efficiency and achieving material and emissions savings.⁴⁷ For example, the goal of one collaborative project is to develop and optimise innovative, large-scale and long-lasting carbon reinforcements for concrete construction. The new reinforcement element makes it possible to save on reinforcement materials and to drastically reduce the environmentally harmful use of concrete as well as CO₂ emissions.⁴⁸

47 <https://www.bmwk.de/Redaktion/EN/Dossier/lightweighting.html>

48 Case study 14 in the 2022 Green Bond Investor Presentation, slide 48: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf.

Table 8: Breakdown of 2021 eligible expenditures in the research, innovation and awareness raising sector by category and budget item and allocation of expenditures to proceeds of the green bond issuances

Responsible ministry	Budget chapter	Budget item	Name of the budget item	Eligible expenditures	Allocated to Green Bobl (Oct. 2027)	Allocated to Green Bund (Aug. 2030)	Allocated to Green Bund (Aug. 2031)	Allocated to Green Bund (Aug. 2050)
1. Research for sustainability								
BMBF	3004	683 10	Knowledge and technology transfer tools as part of the High-Tech strategy	2.3	0.7	0.4	0.3	0.5
BMBF	3004	683 40	Bioeconomy	116.1	34.5	20.7	17.2	27.6
BMBF	3004	685 40	Climate research and Earth's natural habitats – R&D projects	84.2	25.0	15.0	12.5	20.0
BMBF	3004	685 41	Energy technologies and efficient energy use, green hydrogen – R&D projects	176.4	52.4	31.4	26.2	41.9
BMBF	3004	685 42	Environmental technologies, resources and geological research	106.3	31.6	18.9	15.8	25.3
BMBF	3004	685 43	Social sciences for sustainability	43.5	12.9	7.8	6.5	10.3
BMBF	3004	685 44	Ocean, coastal and polar research	51.0	15.1	9.1	7.6	12.1
				579.8	172.2	103.3	86.1	137.7
2. Environmental protection, nature conservation and climate change adaptation								
BMU	1601	544 01	Research, studies, etc. [in the area of environmental protection]	52.0	15.4	9.3	7.7	12.4
BMU	1601	685 04	Subsidies for organisations in the areas of environmental protection and nature conservation	9.6	2.9	1.7	1.4	2.3
BMU	1601	892 01	Investments to reduce pollution [environmental innovation programme, Germany]	17.4	5.2	3.1	2.6	4.1
BMU	1602	685 05	Funding of climate change adaptation measures	11.1	3.3	2.0	1.6	2.6
BMU	1604	544 01	Research, studies, etc. [in the area of nature conservation]	15.3	4.5	2.7	2.3	3.6
				105.4	31.3	18.8	15.6	25.0
3. Aerospace, energy, transport and digitalisation								
BMWi	0901	683 12	Maritime technologies – research, development and innovation	15.5	4.6	2.8	2.3	3.7
BMWi	0901	683 32	National programme for space and innovation – R&D projects	87.0	25.8	15.5	12.9	20.7
BMWi	0901	685 31 894 31	German Aerospace Center (DLR) – operation and investments	521.1	154.7	92.8	77.4	123.8
BMWi (EKF)	6092	683 05	Hybrid electric aviation	37.1	11.0	6.6	5.5	8.8
				660.7	196.2	117.7	98.1	157.0

Table 8: continued

Responsible ministry	Budget chapter	Budget item	Name of the budget item	Eligible expenditures	Allocated to Green Bobl (Oct. 2027)	Allocated to Green Bund (Aug. 2030)	Allocated to Green Bund (Aug. 2031)	Allocated to Green Bund (Aug. 2050)
in € million								
4. Technology transfer – lightweighting								
BMW	0901	683 15	Technology transfer programme – lightweighting	13.9	4.1	2.5	2.1	3.3
BMW (EKF)	6092	686 15	Resource efficiency and substitution					
	6092	686 17	New construction technologies and materials for low-emission industry					
				13.9	4.1	2.5	2.1	3.3
Research, innovation and awareness raising – Total				1,359.8	403.8	242.3	201.9	323.0

3.4 Energy and industry (including the National Climate Initiative)

In order to achieve its climate targets, Germany is fully committed to the energy transition. The energy and industry sector covers measures designed to accelerate the transition to an economy based largely on renewable energy and to an eco-efficient use of energy and resources. The energy and manufacturing industries are responsible for most of Germany's greenhouse gas emissions.

Renewable energy sources are being continuously and reliably expanded. Energy efficiency is being improved in the energy industry itself as well as in the buildings sector and energy-intensive industries. Energy generation with nuclear energy and coal are being gradually phased out.

An important financing instrument in this area is the Energy and Climate Fund. The programmes funded by the Energy and Climate Fund play a central role in implementing the energy transition and in achieving national and international climate action targets. In addition to this sector's eligible expenditures, extensive KfW funding programmes for energy-efficient building refurbishments are taken into account for KfW's own green bonds.

Moreover, measures earmarked in the German Reconstruction and Resilience Plan (DARP) for the EU recovery instrument "Next Generation EU" cannot be taken into account as eligible expenditures for Green German Federal securities.

■ Energy research

Energy research plays a strategic role in energy and economic policies aimed at shaping the energy transition. Funding is focused on technologies and approaches that can significantly improve efficiency, that support the transition to renewable energy sources and that guarantee the security of supply. Research and development into specific technologies is being increased to take account of systemic and cross-system factors (digitalisation of the energy transition, sector coupling).⁴⁹

■ Renewable energy

International efforts to ramp up green hydrogen are supported by the measures of the Foreign Trade Strategy for Hydrogen (*Wasserstoffstrategie Außenwirtschaft*), among other things through the construction of green hydrogen plants.

Table 9: Breakdown of 2021 eligible expenditures in the energy and industry sector by category

Energy and industry	Eligible expenditures	Allocated amount	Share of allocation within the sector	Number of budget items
Category	in € million			
Energy research	564.3	486.0	21.2%	1
Renewable energy	1,408.4	1,212.9	52.8%	4
Energy efficiency	506.2	435.9	19.0%	3
National Climate Initiative and national climate action measures	186.6	160.7	7.0%	2
Energy and industry – Total	2,665.5	2,295.5	100.0%	10

⁴⁹ Case study 15 in the 2022 Green Bond Investor Presentation, slide 49: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf.

To improve framework conditions for shore-to-ship power supply in German ports, the federal government has been providing investment subsidies from the Energy and Climate Fund for programmes at *Länder* level since 2020. On-board power generation from fossil fuels while ships are berthed results in greenhouse gas emissions and air and noise pollution. Plugging into onshore power grids that receive electricity from renewable sources cuts these emissions by 100%. However, because of the high investment costs for shore-to-ship power facilities, shore-to-ship power is rarely available in German ports, particularly for seagoing vessels and river cruise ships. The federal government, which is responsible for climate and environmental action, provides financial assistance to the *Länder* responsible for port infrastructure.

Up to 2021, the use of renewable energy in buildings was funded in particular through the Market Incentives Programme (*Marktanreizprogramm*, MAP).⁵⁰ The aim was to support the market penetration of renewable heating technologies and increase their market share. Solar collector systems, solid biomass combustion systems, efficient heat pumps, deep geothermal systems and particularly innovative technologies for heating and cooling were funded. The funding from the Market Incentives Programme was disbursed in part through investment subsidies, particularly for smaller renewable energy heating systems in detached and semi-detached homes. The subsidies are administered by the Federal Office for Economic Affairs and Export Control (BAFA). In 2021 the Market Incentives Programme was replaced by the funding programme “Federal Funding for Efficient Buildings” (*Förderprogramm Bundesförderung für effiziente Gebäude* (BEG)).⁵¹

■ Energy efficiency

The programme “Federal Funding for Energy and Resource Efficiency in the Economy” (*Bundesförderung für Energie- und Ressourceneffizienz in der Wirtschaft*) funds measures to increase energy and resource efficiency and reduce carbon emissions in industry and businesses. Among other things this involves (a) the use of waste heat, (b) the conversion of processes and procedures to efficient technologies, and (c) highly efficient facilities for producing process heat from solar collectors, heat pumps and biomass. In addition, the German government finances advisory services on energy consumption and corresponding measures for all end users such as private households, small and medium-sized businesses and public authorities. Advice is provided on subjects such as increasing energy efficiency and the use of renewable energy (e.g. ways of saving energy, insulation, modern heating technology) and optimising heating systems.

Funding of battery cell production (industrial production of mobile and stationary energy storage units) supports the development of innovative and sustainable processes for the industrial production of batteries for electric vehicles and other applications, as well as the development of re-use and recycling systems. The projects funded within the scope of two Important Projects of Common European Interest (IPCEIs) will result in battery cells with lower carbon footprints being produced in Germany in the future, and create the conditions for the large-scale recycling of raw materials used in the manufacturing of batteries.

50 Case study 16 in the 2022 Green Bond Investor Presentation, slide 50: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf.

51 Expenditures for KfW administered programmes to support energy-efficient construction and building renovation (*CO₂-Gebäudesanierungsprogramm*), are used by KfW for its own green bonds and are not taken into account for Green German Federal securities. Since the Federal Funding for Efficient Buildings expenditures are partially refinanced through DARF funds, they are not taken into account for Green German Federal securities.

Table 10: Breakdown of 2021 eligible expenditures in the energy and industry sector by category and budget item and by allocation of expenditures to proceeds of the green bond issuances

Responsible ministry	Budget chapter	Budget item	Name of the budget item	Eligible expenditures	Allocated to Green Bobl (Oct. 2027)	Allocated to Green Bund (Aug. 2030)	Allocated to Green Bund (Aug. 2031)	Allocated to Green Bund (Aug. 2050)
in € million								
1. Energy research								
BMWi	0903	683 01	Energy research	564.3	167.6	100.5	83.8	134.1
				564.3	167.6	100.5	83.8	134.1
2. Renewable energy								
BMWi	0904	896 02	Foreign Trade Strategy for Hydrogen – International Cooperation Hydrogen	35.5	10.5	6.3	5.3	8.4
BMWi (EKF)	6092	686 13	Energy transition programmes and measures in the areas of renewable energy sources, electricity and power grids, digitalisation and energy infrastructure	16.4	4.9	2.9	2.4	3.9
BMWi (EKF)	6092	882 01	Improving framework conditions for shore-to-ship power supply in German ports	21.8	6.5	3.9	3.2	5.2
BMWi (EKF)	6092	893 10	Funding to promote energy efficiency and renewable energy measures in buildings	1,334.7	396.3	237.8	198.2	317.1
				1,408.4	418.2	250.9	209.1	334.6
3. Energy efficiency								
BMWi (EKF)	6092	686 08	Energy efficiency in industry and businesses	352.6	104.7	62.8	52.4	83.8
BMWi (EKF)	6092	686 14	Providing advice on energy efficiency	98.8	29.3	17.6	14.7	23.5
BMWi (EKF)	6092	893 04	Industrial production of mobile and stationary energy storage units	54.8	16.3	9.8	8.1	13.0
				506.2	150.3	90.2	75.2	120.3
4. National Climate Initiative								
BMU (EKF)	6092	686 05	National Climate Initiative	173.0	51.4	30.8	25.7	41.1
BMU (EKF)	6092	686 23	National climate action measures	13.6	4.0	2.4	2.0	3.2
				186.6	55.4	33.2	27.7	44.3
Energy and industry – Total				2,665.5	791.5	474.9	395.8	633.2

National Climate Initiative and national climate action measures

The National Climate Initiative was established in 2008 to actively develop and implement innovative approaches together with citizens and stakeholders from civil society, the business community and the research community. The project encompasses a broad range of climate action activities, from the development of long-term strategies to specific support and financing measures in the areas of energy, transport and business/industry, which will contribute to the reduction of greenhouse gas emissions.

3.5 Agriculture, forestry, natural landscapes and biodiversity

The agricultural and forestry sector, more than any other economic sector, is under direct pressure to adapt to the effects of climate change and to protect natural resources, ecosystems and biodiversity. The sector also plays a key role in climate protection. In 2021, the agricultural sector accounted for 8% of Germany's total greenhouse gas emissions (CO₂ equivalents).⁵² As an important economic sector throughout the country, the agricultural and forestry sector plays a crucial role in achieving Germany's sustainability and climate goals.

Table 11: Breakdown of 2021 eligible expenditures in the agriculture, forestry, natural landscapes and biodiversity sector by category

Agriculture, forestry, natural landscapes and biodiversity	Eligible expenditures	Allocated amount	Share of allocation within the sector	Number of budget items
Category	in € million			
Agriculture	83.4	71.8	10.9%	5
Land use, land-use change and forestry (LULUCF)	212.9	183.3	27.8%	8
Biodiversity and natural landscapes	234.3	201.8	30.5%	7
Coastal and flood protection	236.4	203.6	30.8%	4
Agriculture, forestry, natural landscapes and biodiversity – Total	767.0	660.5	100.0%	24

⁵² The German government's 2022 Climate Action Report (available in German only): <https://www.bmwk.de/Redaktion/DE/Downloads/Energie/klimaschutzbericht.html>

■ Agriculture

The objective of the “Federal Scheme for Organic Farming and other Forms of Sustainable Agriculture” (*Bundesprogramm Ökologischer Landbau und andere Formen nachhaltiger Landwirtschaft, BÖLN*) is to improve the conditions for sustainable and organic farming and the organic food industry and to create the conditions for the balanced growth of supply and demand. The scheme focuses on funding research projects in the area of organic farming and disseminating the findings in practice. Besides implementing research and develop projects, BÖLN also funds training and awareness-raising measures for producers and consumers. Research and development projects as well as technology and knowledge transfer measures for the sustainable production, processing and marketing of agricultural products have also been funded since 2011.

Since 2019, the “Federal Programme to Enhance Energy Efficiency and Reduce Carbon Emissions in Agriculture and Horticulture” (*Bundesprogramm zur Steigerung der Energieeffizienz und CO₂-Einsparung in Landwirtschaft und Gartenbau*) has been part of the Federal Ministry of Food and Agriculture’s climate action package to support the federal government’s 2030 Climate Action Plan. The goal is to significantly reduce carbon emissions from stationary and mobile energy use in agriculture and horticulture. That is why, as well as funding advisory services and energy saving investments, the programme also provides funding in the areas of renewable energy production, waste heat in agricultural companies, and mobile agricultural machinery and equipment.

■ Land use, land-use change and forestry (LULUCF)

The land use, land-use change and forestry (LULUCF) sector usually acts as a “sink” for greenhouse gas emissions (11 million tonne reduction of CO₂ equivalents in 2021).⁵³

The German government’s funding programmes as well as the joint Federation/*Länder* programme “Improvement of Agricultural Structures and Coastal Protection” (*Gemeinschaftsaufgabe Verbesserung der Agrarstruktur und des Küstenschutzes, GAK*) are aimed at supporting sustainable and resource-conserving agriculture and forestry and taking environmental and climate needs, such as the protection of natural habitats, into even greater account.

The Federation and *Länder* support the development of sustainable close-to-nature forest management, e.g. to mitigate the effects of extreme weather events, which are becoming more prevalent as a result of climate change, as well as appropriate preventive measures (especially the development of resilient forests). Since 2013, the Forest Climate Fund (*Waldklimafonds, WKF*) has supported research, development and demonstration projects as well as dialogue and knowledge transfer between research and practice in matters relating to climate action in forests and the adaptation of forests to climate change.⁵⁴

The Federal Ministry of Food and Agriculture’s “Renewable Resources” programme funds research, development and demonstration measures in the area of renewable resources. The objectives of the programme include the efficient and environmentally friendly use of resources including emissions avoidance or sequestration of greenhouse gases and protecting biodiversity.

53 The German government’s 2022 Climate Action Report (available in German only): <https://www.bmwk.de/Redaktion/DE/Downloads/Energie/klimaschutzbericht.html>

54 Case study 18 in the 2022 Green Bond Investor Presentation, slide 52: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf.

An example of a measure being funded by the programme is the project “InsHabNet”, which develops strategies to protect endangered insect populations against the fragmentation of their habitats.⁵⁵

■ Biodiversity and natural landscapes

The federal government provides funding for various programmes dedicated to the conservation of biodiversity and the protection of endangered species.

The programme “Improvement of Agricultural Structures and Coastal Protection” (GAK), which is co-financed by the federal government and the *Länder*, funds methods for market- and locally-adapted and environmentally friendly land management, including contractual nature conservation and landscape management. This includes particularly sustainable practices in arable farming, the cultivation of annual specialised crops, permanent grasslands, permanent crops and extensive orchards.

The federal programme “Biodiversity” (*Biologische Vielfalt*) is the Environment Ministry’s main funding programme to improve biodiversity and at the same time its most important funding instrument, in particular to tackle insect decline. The funded measures include projects particularly in the areas of insect conservation in cities (*Masterplan Stadtnatur*) and in protected areas (especially biosphere reserves) as well as projects to increase and disseminate knowledge about insects.

The programme “chance.natur” promotes the establishment and preservation of natural areas of national importance. It makes an important contribution to protecting Germany’s biodiversity and natural heritage.

Through the “Wilderness Fund” (*Wildnisfonds*), suitable areas of land such as forests and moors, as well as their usage rights, are purchased and placed under protection. In this way the government aims to reach its goal of maintaining 2% of Germany’s total area as wilderness.

■ Coastal and flood protection

The main purpose of coastal and flood protection measures is to protect the population. Following the IPCC’s Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC), higher wind speeds and an increase in extreme waves, combined with the rise in sea levels, are exacerbating extreme weather conditions and dangers in coastal regions. Besides being a threat to humans, floods cause the destruction of natural landscapes, agricultural land and wildlife. As a programme financed jointly by the federal government and the *Länder*, the GAK programme includes numerous funding options to implement a wide range of coastal and flood protection measures. GAK funding measures are implemented by the *Länder*. The federal government provides 70% of the financing for coastal and 60% of the financing for flood protection measures.

⁵⁵ Case study 19 in the 2022 Green Bond Investor Presentation, slide 53: https://www.deutsche-finanzagentur.de/fileadmin/user_upload/Institutionelle-investoren/green/presentations/Green_Bond_Investor_Presentation_2022_II.pdf.

Table 12: Breakdown of 2021 eligible expenditures in the agriculture, forestry, natural landscapes and biodiversity sector by category and budget item and by allocation of expenditures to proceeds of the green bond issuances

Responsible ministry	Budget chapter	Budget item	Name of the budget item	Eligible expenditures	Allocated to Green Bobl (Oct. 2027)	Allocated to Green Bund (Aug. 2030)	Allocated to Green Bund (Aug. 2031)	Allocated to Green Bund (Aug. 2050)
1. Agriculture								
BMEL	1005	686 43	Subsidies to fund organic farming and other sustainable forms of agriculture (BÖLN)	12.9	3.8	2.3	1.9	3.1
BMEL	1005	686 31 893 31	Funding of innovation in the area of food, agriculture and health-related consumer protection	45.2	13.4	8.1	6.7	10.7
BMEL (EKF)	6092	686 22 893 07	Subsidies to fund measures for improving energy efficiency in agriculture and horticulture Investment subsidies to fund measures for improving energy efficiency in agriculture and horticulture	25.3	7.5	4.5	3.8	6.0
				83.4	24.8	14.9	12.4	19.8
2. Land use, land-use change and forestry (LULUCF)								
BMEL	1005	686 11 893 11	Subsidies to fund research, development and demonstration projects in the area of renewable resources and to fund national sustainable forestry projects Subsidies to fund research, development and demonstration projects in the area of renewable resources (investments)	47.6	14.1	8.5	7.1	11.3
BMEL	Annex 1 to 1003 (1095)	686 15 632 41 882 41	Subsidies to fund the sustainable use of wood Grants to fund forestry measures (excluding investments) Grants to fund forestry measures (investments)	29.3	8.7	5.2	4.4	7.0
BMEL	Annex 1 to 1003 (1095)	632 42 882 42	Grants to fund measures that combat the effects of extreme weather events in forests (excluding investments) Grants to fund measures that combat the effects of extreme weather events in forests (investments)	113.6	33.7	20.2	16.9	27.0
BMEL+ BMU (EKF)	6092	686 06	Forest Climate Fund	22.4	6.7	4.0	3.3	5.3
				212.9	63.2	37.9	31.6	50.6

Table 12: continued

Responsible ministry	Budget chapter	Budget item	Name of the budget item	Eligible expenditures	Allocated to Green Bobl (Oct. 2027)	Allocated to Green Bund (Aug. 2030)	Allocated to Green Bund (Aug. 2031)	Allocated to Green Bund (Aug. 2050)
in € million								
3. Biodiversity and natural landscapes								
BMEL	Annex 1 to 1003 (1095)	632 33	Grants for funding environmentally friendly land management geared to market and local conditions, including contractual nature conservation and landscape management	119.3	35.4	21.3	17.7	28.3
		882 31	Grants for funding environmentally friendly land management geared to market and local conditions, including contractual nature conservation and landscape management (investment in nature conservation)					
BMEL	Annex 1 to 1003 (1095)	632 97	Federal share of financing for the special framework programme for insect protection measures (excluding investments)	57.7	17.1	10.3	8.6	13.7
		882 97	Federal share of financing for the special framework programme for insect protection measures (investments)					
BMU	1604	685 01	Grants to fund measures within the federal programme for biodiversity	39.7	11.8	7.1	5.9	9.4
BMU	1604	882 01	Grants for the establishment and long-term protection of areas of nature and landscapes of national importance (chance.natur)	11.9	3.5	2.1	1.8	2.8
BMU	1604	893 02	Wilderness Fund	5.7	1.7	1.0	0.8	1.4
				234.3	69.6	41.7	34.8	55.7
4. Coastal and flood protection								
BMEL	Annex 1 to 1003 (1095)	882 15	Grants to fund flood protection facilities, the renaturation of dykes, torrent control and the renaturation of water bodies	74.9	22.2	13.3	11.1	17.8
BMEL	Annex 1 to 1003 (1095)	882 61	Grants to fund coastal protection measures	77.3	23.0	13.8	11.5	18.4
BMEL	Annex 1 to 1003 (1095)	882 81	Grants to fund coastal protection measures to counter the effects of climate change	23.7	7.0	4.2	3.5	5.6
BMEL	Annex 1 to 1003 (1095)	882 82	Federal share of funding for the special framework programme for preventative flood protection measures	60.5	18.0	10.8	9.0	14.4
				236.4	70.2	42.1	35.1	56.2
Agriculture, forestry, natural landscapes and biodiversity – Total				767.0	227.8	136.7	113.9	182.2

Annex

Third-party verification

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INDEPENDENT PRACTITIONER'S REPORT ON A LIMITED ASSURANCE ENGAGEMENT REGARDING GERMANY'S GREEN BOND ALLOCATION REPORT 2022

To Federal Ministry of Finance (Bundesministerium der Finanzen), Berlin/Germany, representing the Federal Government of Germany

Engagement

We have performed a limited assurance engagement on the Green Bond Allocation Report 2022 (hereinafter "Green Bond Allocation Report") for

- Germany's 5-year Green Federal Bond (hereinafter "Green Bobl (Oct 2027)"), issued on 31 August 2022 with an issuance volume of EUR 5bn,
- Germany's 10-year Green Federal Bond (hereinafter "Green Bund (Aug 2030)"), tapped by EUR 1.5bn on 2 March 2022 and tapped by EUR 1.5bn on 20 July 2022 to the volume of EUR 9.5bn,
- Germany's 10-year Green Federal Bond (hereinafter "Green Bund (Aug 2031)"), tapped by EUR 1.5bn on 4 May 2022 and tapped by EUR 1bn on 2 November 2022 to a total volume of EUR 9bn, and
- Germany's 30-year Green Federal Bond (hereinafter "Green Bund (Aug 2050)"), tapped by EUR 4bn on 1 June 2022 to a total volume of EUR 10bn.

The Green Bond Allocation Report was prepared on the basis of the Federal budget of the fiscal year 2021 and a list of hereof positions of Eligible Green Expenditures as defined in Germany's Green Bond Framework as of 24 August 2020 and validated by the Inter-Ministerial Working Group for the period from 1 January to 31 December 2021.

Our limited assurance engagement was bounded to the accuracy of the Green Bond Allocation Report with regard to the proportional allocation of the proceeds from the Green Bobl (Oct 2027), Green Bund (Aug 2030), Green Bund (Aug 2031) and Green Bund (Aug 2050) to the Eligible Green Expenditures from the previous year in accordance with the process for expenditure evaluation and selection as well as requirements for allocation reporting set out in Germany's Green Bond Framework.



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Our engagement has not covered whether Germany's Green Bond Framework has met the criteria of the Green Bond Principles as issued by the International Capital Markets Association (ICMA). Moreover, our engagement did not include any checks of compliance of Germany's Green Bond Framework with important elements of the draft EU Green Bond Standard. We did not validate whether the expenditures used for the allocation of proceeds in the Green Bond Allocation Report are Eligible Green Expenditures, either. Our Engagement did not cover any other aspect than the proportional allocation and whether the Eligible Green Expenditures selected by the Core Green Bond Team were listed in the Federal budget of the fiscal year 2021. Further our engagement did not cover any external sources of documentation or expert opinions quoted in the Allocation Report.

Responsibilities of the Federal Republic of Germany

The Federal Ministry of Finance, Division VII C 2, is responsible for preparing the Green Bond Allocation Report on the basis of the Federal budget of the fiscal year 2021 and a list of hereof positions of Eligible Green Expenditures for the period from 1 January to 31 December 2021 and in accordance with Germany's Green Bond Framework. The report was compiled by the Federal Government's Core Green Bond Team, comprising the Federal Ministry of Finance (lead), the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection and the Bundesrepublik Deutschland - Finanzagentur GmbH ("German Finance Agency"), on the basis of information provided and validated by the Inter-Ministerial Working Group.

The responsibilities of the Core Green Bond Team include the selection and application of appropriate methods for preparing the Green Bond Allocation Report as well as making assumptions and estimates for individual disclosures, which are reasonable under the given circumstances. In addition, the Core Green Bond Team is responsible for such arrangement and measures determined necessary to enable the preparation of the Green Bond Allocation Report that is free from material misstatement, whether due to fraud or error.

The Core Green Bond Team and the Inter-Ministerial Working Group act on behalf of the Federal Government of Germany and were set up by the Federal Minister of Finance based on the Cabinet decision to adopt the Climate Protection Program 2030.

Responsibilities of the Independent Practitioner

Our responsibility is to express a conclusion on the Green Bond Allocation Report based on our work performed within our limited assurance engagement.

Our audit firm applies the Quality Assurance Standard: Quality Assurance Requirements in Audit Practices (IDW QS 1) promulgated by the Institut der Wirtschaftsprüfer (IDW). We have fulfilled the professional responsibilities in accordance with the German Public Auditor Act (WPO) and the Professional Code of Conduct for German Public Auditors and Sworn Auditors (BS WP/vBP) including the requirements on independence.



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We are independent of the Federal Government of Germany in accordance with the provisions under German commercial law and professional requirements, and we have fulfilled our other ethical responsibilities in accordance with the relevant provisions within these requirements

We conducted our work in accordance with the International Standard on Assurance Engagements 3000 (Revised): Assurance Engagements Other than Audits or Reviews of Historical Financial Information (ISAE 3000 (Revised)), developed and approved by the IAASB. This Standard requires that we plan and perform the assurance engagement so that we can conclude with limited assurance whether matters have come to our attention to cause us to believe that the Green Bond Allocation Report as a whole has not been prepared, in all material respects, in accordance with the Federal budget of the fiscal year 2021 and a list of hereof positions of Eligible Green Expenditures as well as that the allocation has not been done on a proportional basis or that it has not been done in accordance with the process for expenditure evaluation and selection as well as the requirements for allocation reporting set out in Germany's Green Bond Framework.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement; consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. The choice of assurance work is subject to the practitioner's professional judgment.

Within the scope of our limited assurance engagement, we notably performed the following work:

- Interviews of relevant responsible members of the Core Green Bond Team, notably staff of the BMF and the German Finance Agency
- Reconciliation of the allocated amounts and the Eligible Green Expenditures of the Federal budget 2021 for each category and each budget item prepared in the Green Bond Allocation Report 2022
- Plausibility and consistency checks on quantitative information on allocated amounts for each category and each budget item of the Federal budget 2021 prepared in the Green Bond Allocation Report 2022
- Assessing whether the Green Bobl (Oct 2027), the Green Bund (Aug 2030), the Green Bund (Aug 2031), and the Green Bund (Aug 2050) received proportional allocation of the 2021 final Eligible Green Expenditures in accordance with the Federal budget of the fiscal year 2021 and a list of hereof positions of Eligible Green Expenditures
- Identification of the risks of material misstatement within the Allocation Report 2022

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.



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Practitioner's conclusion

Based on the work performed and the evidence obtained, nothing has come to our attention that causes us to believe that the Green Bond Allocation Report 2022, for the Green Bobl (Oct 2027), the Green Bund (Aug 2030), the Green Bund (Aug 2031), and the Green Bund (Aug 2050) as a whole is not prepared, in all material respects, on the basis of the Federal budget of the fiscal year 2021 and a list of hereof positions of Eligible Green Expenditures as well as that the allocation has not been done on a proportional basis or in accordance with the process for expenditure evaluation and selection as well as the requirements for allocation reporting set out in Germany's Green Bond Framework.

Our opinion does not include the aspects excluded in the third paragraph in section "Engagement".

Specific purpose

Without modifying our conclusion we call attention that the Green Bond Allocation Report was prepared to report on the allocation of Eligible Green Expenditures to the Green Bobl (Oct 2027), issued on 31 August 2022, the Green Bund (Aug 2030), tapped by EUR 1.5bn on 2 March 2022 and tapped by EUR 1.5bn on 20 July 2022 to the volume of EUR 9.5bn, the Green Bund (Aug 2031), tapped by EUR 1.5bn on 4 May 2022 and tapped by EUR 1bn on 2 November 2022 to a total volume of EUR 9bn, and the Green Bund (Aug 2050), tapped by EUR 4bn on 1 June 2022 to a total volume of EUR 10bn. Therefore, the Green Bond Allocation Report may not be suitable for another purpose.

Restriction of Use and Reference to Limitation of Liability

This report is addressed to the Federal Ministry of Finance representing the Federal Government of Germany, only. This report is not intended to be used by third parties as a basis for making (financial) decisions. We issue this report based on the terms and conditions of the framework agreement agreed with the Federal Government, represented by the BMF, on 18 March 2021, wherein the liability is limited. We are liable solely to the Federal Government of Germany. We assume no responsibility with regard to any third parties.

Düsseldorf/Germany, 23 March 2023

Deloitte GmbH

Wirtschaftsprüfungsgesellschaft

(Andreas Koch)
Wirtschaftsprüfer

(ppa. Andrea Flunker)

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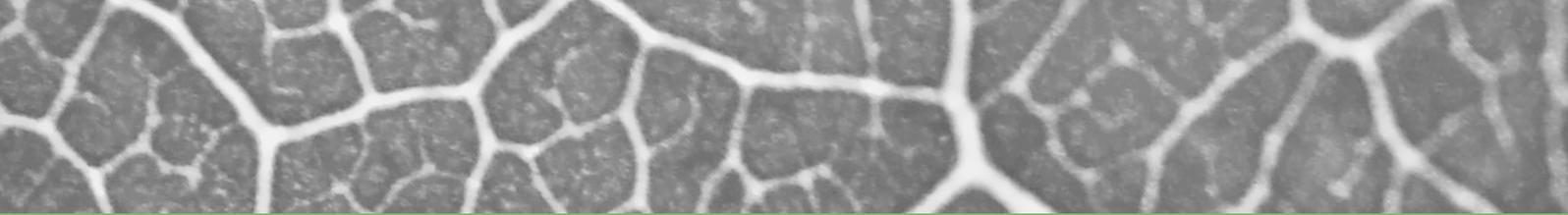
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