

ASSESSMENT

2 June 2023



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Land of Baden-Wuerttemberg

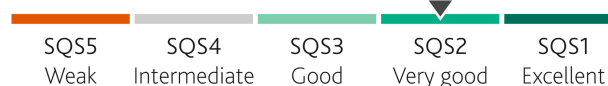
Second Party Opinion – Green Bond Framework Assigned SQS2 Sustainability Quality Score

Summary

We have assigned an SQS2 Sustainability Quality Score (Very good) to the Land of Baden-Wuerttemberg's (Baden-Wuerttemberg) green bond framework dated 10 May 2023. The federal state has established its use-of-proceeds framework to finance projects across 10 eligible green categories. Green bonds issued during the 2023 budget year will finance — in an amount equivalent to the amount of the issued bonds — the list of eligible expenditures for the 2022 budget year, covering the 10 eligible categories. Baden-Wuerttemberg has described the main characteristics of the green bonds within a formalized framework that is aligned with the four core components of the International Capital Market Association's (ICMA) Green Bond Principles 2021 (including the June 2022 Appendix 1). The framework demonstrates a high overall contribution to sustainability.

Sustainability quality score

SQS2

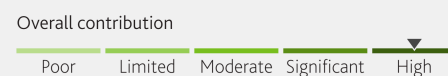


Alignment with principles USE OF PROCEEDS



| FACTORS | ALIGNMENT |
|--------------------------|-----------|
| Use of proceeds | Aligned |
| Evaluation and selection | Aligned |
| Management of proceeds | Aligned |
| Reporting | Aligned |

Contribution to sustainability



| Expected impact Relevance and magnitude | ADJUSTMENTS |
|--|------------------------------------|
| High | ESG risk management: No adjustment |
| | Coherence: No adjustment |

Scope

We have provided a second party opinion (SPO) on the green credentials of the Land of Baden-Wuerttemberg's green bond framework, including the framework's alignment with the ICMA's Green Bond Principles 2021 (including the June 2022 Appendix 1). Under its framework, the Land of Baden-Wuerttemberg — acting through the Ministry of Finance — plans to issue use-of-proceeds green bonds to refinance expenditures associated with projects across 10 green categories as part of its continuous, annual green bond program. For more details on the eligible project categories, please see Appendix 2.

Our assessment is based on Baden-Wuerttemberg's green bond framework dated 10 May 2023, as well as the list of eligible expenditures for the 2022 budget year that the land expects to finance under its framework. Our opinion reflects our point-in-time assessment of the details contained in this version of the framework, as well as other public and non-public information provided by the sub-sovereign, including the list of eligible expenditures.

We produced this SPO based on our [Framework to Provide Second Party Opinions on Sustainable Debt](#), published in October 2022.

Issuer profile

Baden-Wuerttemberg is one of the 16 federal states in Germany and is located in the south west of the country. With an area of 35,751 square kilometers (km²) and a population of around 11.1 million people, the local authority is the third-largest state of Germany in terms of inhabitants and size. The population density is 312 inhabitants per km². Baden-Wuerttemberg has a strong and well-diversified regional economy (based on a combination of medium-sized companies and several large corporations), making it one of the wealthiest regions in Europe.

The Land of Baden-Wuerttemberg has neutral-to-low exposure to environmental and social risks, along with very strong governance and policy effectiveness that mitigate the region's susceptibility to these risks. The economy is characterized by technology (IT and communication), engineering (mechanical, electrical and automotive) and a growing tertiary sector. In particular, the automotive and manufacturing industries are currently pursuing a carbon transitioning path. The region faces a trend of aging population, resulting in declining labor supply and higher pension and social cost. On the other hand, the region has strong labor and income, with relatively low unemployment levels, and overall solid and good access to basic services and housing.

In 2021, Baden-Wuerttemberg became the first German regional government to launch a green bond with proceeds earmarked for a range of green-oriented projects and initiatives.

Strengths

- » Several eligible categories intend to finance activities that potentially contribute to a significant reduction of greenhouse gas (GHG) emissions and accelerate the transition of Baden-Wuerttemberg to a low-carbon economy
- » Clearly defined and relevant environmental benefits associated with the eligible projects
- » Comprehensive and transparent project evaluation and selection processes are in place and include relevant expertise
- » Sophisticated impact and allocation reporting, including independent verification, ensuring a high level of transparency for investors

Challenges

- » Although the eligible green project list is accompanied by supplemental explanatory material, the definition of eligibility criteria can at times lack exhaustive definitions

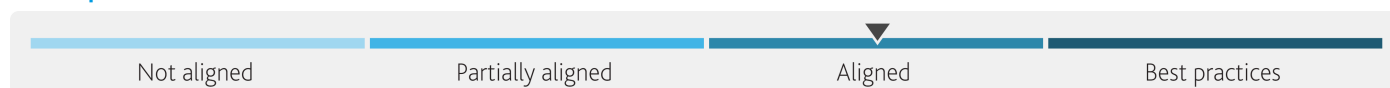
This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on <https://ratings.moody's.com> for the most updated credit rating action information and rating history.

Alignment with principles

The Land of Baden-Wuerttemberg's green bond framework is aligned with the four pillars of the ICMA's Green Bond Principles 2021 (including the June 2022 Appendix 1):

- Green Bond Principles (GBP)
- Social Bond Principles (SBP)
- Green Loan Principles (GLP)
- Social Loan Principles (SLP)
- Sustainability-Linked Bond Principles (SLBP)
- Sustainability Linked Loan Principles (SLLP)

Use of proceeds



Clarity of the eligible categories – ALIGNED

Next to its green bond framework, the Land of Baden-Wuerttemberg has shared the list of projects to be refinanced via the 2023 bond issuances, which provides clear visibility into the projects and activities to be financed with the bond proceeds. The list of projects is accompanied by fact sheets with detailed project descriptions, some of which, however, lack granularity in terms of technical thresholds. The bond proceeds will be used exclusively to refinance investments in accordance with the applicable budgetary regulations and the eligibility criteria of the framework. All eligible projects are located in Baden-Wuerttemberg.

Clarity of the environmental objectives – BEST PRACTICES

The federal state has clearly outlined six environmental objectives associated with the projects, which are coherent with international standards such as the European Union (EU) Taxonomy. These objectives are presented in Appendix 2. All financed projects are relevant to the respective environmental objectives. The framework has referenced relevant United Nations' (UN) Sustainable Development Goals (SDGs) and associated targets.

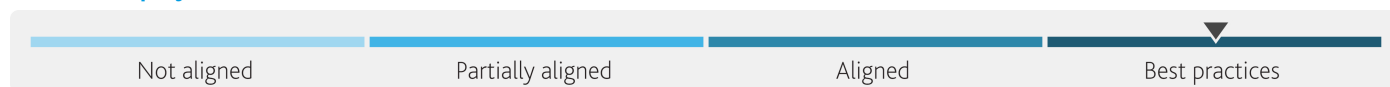
Clarity of the expected benefits – BEST PRACTICES

Baden-Wuerttemberg has identified clear expected environmental benefits for all the eligible categories. These benefits are measurable and will be quantified in the reporting, and are considered relevant for all eligible categories. All the raised bond proceeds will be allocated to expenditures for the 2022 budget year. Therefore, the share of refinancing is 100%, and the look-back period is inherently limited to less than 24 months.

Best practices identified

- » Objectives set are defined, relevant and coherent for all project categories
- » Relevant benefits are identified for all project categories
- » Benefits are measurable and quantified for most projects, either ex-ante with clear baselines or with a commitment to do so in future reporting
- » Commitment to transparently disclose the share of proceeds used for refinancing where feasible
- » Commitment to transparently communicate the associated look-back periods where feasible

Process for project evaluation and selection



Transparency and quality of process for defining eligible projects – BEST PRACTICES

The federal state has established a clear, structured process for evaluating and selecting eligible projects formalized in its publicly available framework. An interministerial working group has been set up for collaboration between the ministries involved in green bond issuances. Within this working group, a coordination group — consisting of representatives of the Ministry of Finance/Treasury, the State Ministry, and the Ministry for the Environment, Climate and Energy Sector — ensures quality control and is ultimately responsible for the selection of eligible projects and expenditures. Furthermore, the coordination group oversees the implementation of the framework and monitors the continued fulfillment of eligibility criteria and potential ESG controversies permanently via the annual impact report and thereby inherently throughout the life of the bond. Roles and responsibilities within the working group are clear and include relevant internal expertise, enriched with contributions from external consultants.

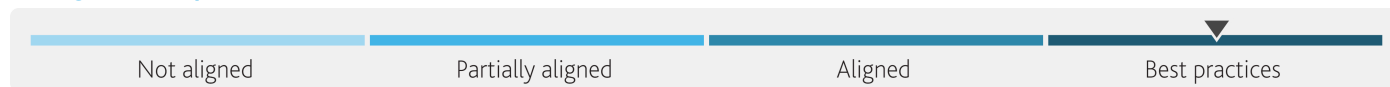
Environmental and social risk mitigation process – BEST PRACTICES

The environmental and social risk mitigation process is formalized and disclosed at the project level in the impact report. Significant environmental and social risks are assessed across the eligible categories for potential violations of international standards and agreements, such as the EU Taxonomy's Do No Significant Harm (DNSH) criteria. Continuous monitoring of potential controversies is part of the interministerial working group's responsibilities.

Best practices identified

- » The roles and responsibilities for project evaluation and selection are defined and include relevant expertise
- » There is evidence of continuity in the selection and evaluation process through the life of the financial instruments, including compliance verification and procedures to undertake mitigating actions when needed
- » The process for project evaluation, selection and monitoring is traceable
- » Material environmental and social risks for most project categories are identified
- » Presence of corrective measures to address environmental and social risks across projects
- » ESG controversies are monitored

Management of proceeds



Allocation and tracking of proceeds – BEST PRACTICES

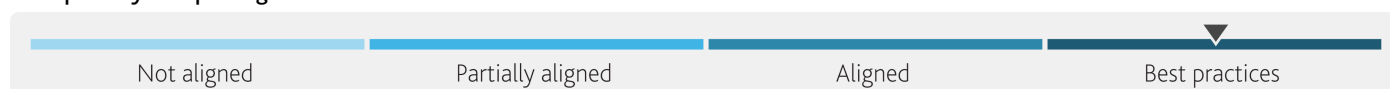
The federal state has defined a clear process for the management and allocation of bond proceeds in its publicly available framework, which is part of the responsibilities of the interministerial working group. Net proceeds raised under the framework will be allocated to eligible expenditures from the previous budget year immediately at the time of issuance in accordance with the framework. This inherently ensures compliance with best practices in terms of the allocation period and proceeds management requirements.

Management of unallocated proceeds – BEST PRACTICES

Because Baden-Wuerttemberg will allocate all the proceeds raised via issuances under this framework immediately to eligible expenditures from the previous budget year, the federal state adheres to relevant best practices for the management of unallocated proceeds.

Best practices identified

- » Broad disclosure of a clearly articulated and comprehensive management of proceeds policy to external stakeholders; bondholders at a minimum
- » Short allocation period, for example, typically less than 24 months
- » Disclosure on temporary placement and presence of exclusion criteria toward environmentally or socially harmful activities
- » Commitment to reallocate proceeds to projects that are compliant with the framework

Reporting**Transparency of reporting – BEST PRACTICES**

Baden-Wuerttemberg will report annually on the bonds issued under its framework, and this reporting will be made publicly available. Impact reporting associated with Baden-Wuerttemberg's green bonds will not only include the eligible green project list from a given year, but will rather take a cumulative look at all projects that have been refinanced under the framework in the past. The reporting will therefore be prepared throughout the life of any of the issuances. The reporting is exhaustive and includes the description of financed projects, expected green benefits, the amount allocated across eligible expenditures, and inherently the share of refinancing (i.e., 100%) and unallocated proceeds (i.e., 0%).

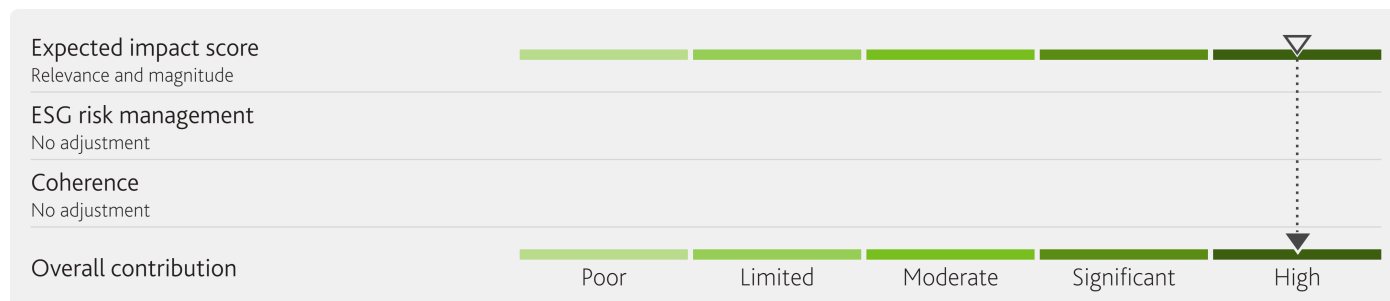
The federal state has identified relevant environmental reporting indicators for all the 10 eligible categories, which are publicly disclosed in the framework. The methodologies and assumptions used to report on the environmental impact of eligible projects will be publicly disclosed in the reporting. Baden-Wuerttemberg will seek an independent verification of its proceeds allocation and impact on an annual basis until the maturity of the issued instruments.

Best practices identified

- » Reporting until full bond maturity
- » Reporting covers material developments and issues related to the projects
- » Reporting on allocation of proceeds and benefits done at least at eligible category level
- » Exhaustive allocation reporting – balance or % of unallocated funds, types of temporary investments (e.g. cash or cash equivalent) and share of financing vs refinancing
- » Clear and relevant indicators to report on the expected environmental impact of all the projects, where feasible, or eligible categories
- » Disclosure of reporting methodology and calculation assumptions to bondholders at a minimum
- » Independent audit of the tracking and allocation of funds at least until full allocation and in case of material changes
- » Independent impact assessment on environmental benefits by a qualified third-party reviewer at least until full allocation and in case of material changes

Contribution to sustainability

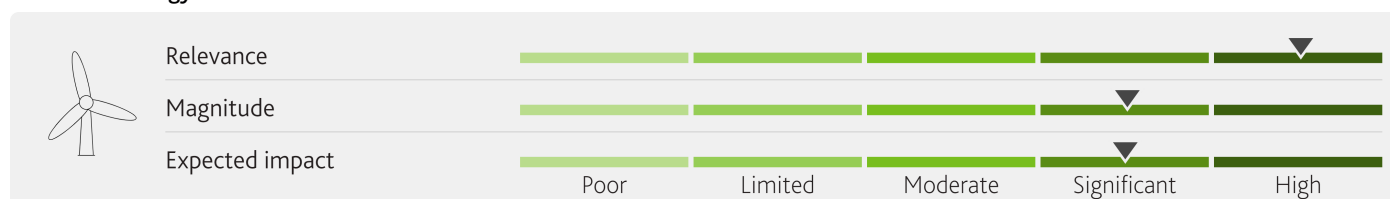
The framework demonstrates an overall high contribution to sustainability.



Expected impact

The expected impact of the eligible projects on environmental objectives is high. Based on information provided by the issuer, we have used the actual proceeds allocation to weight the categories, with green buildings and clean transportation together accounting for more than half of all allocations made under this framework for the budget year in question. A detailed assessment by eligible category is provided below.

Renewable energy

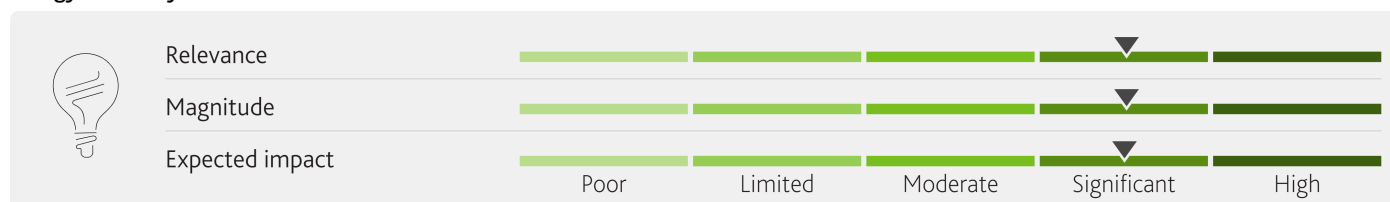


Under this category, the federal state plans to refinance expenditures related to funding programs that promote the increase in renewable energy capacities and energy-efficient renovations of buildings, and R&D-related expenses that facilitate research on renewable energy technologies or promote climate change-related protection strategies of cities or regions in Baden-Wuerttemberg.

Renewable energy is highly relevant to respond to key environmental challenges in the region and is likely to provide long-term durability to safeguard against rising climate risks. While the share of renewable energy in Germany's power mix was around 42% in 2021¹, which is above the global average, its electricity production remains substantially carbonized and the gap to some of its European peers can be significant at times. The share of renewable energy in Baden-Wuerttemberg was around 36% in 2021², below the national average. This indicates a particular need for increased capacities in the local context.

The magnitude of this category is significant. We expect the increased renewable energy capacities promoted by the incentives provided via the funding programs to have a long-term positive effect on Baden-Wuerttemberg's share of renewable energy in its energy mix. The federal state promotes the expansion of mainly solar photovoltaic, which is considered as a highly relevant technology eligible under recognized international standards. This is further supported by expected developments enabled via the funding of real labs and research facilities, especially those related to higher efficiencies in solar cells, increased fuel cell production and hydrogen, which represent some of the most relevant and promising technologies. A minor share of the proceeds is allocated to projects with less significant direct effects on renewable energy production capacities. Also, the construction of a new research building financed under this category does not necessarily adhere to recognized efficiency standards. We expect potential negative externalities to be limited and managed appropriately.

Energy efficiency

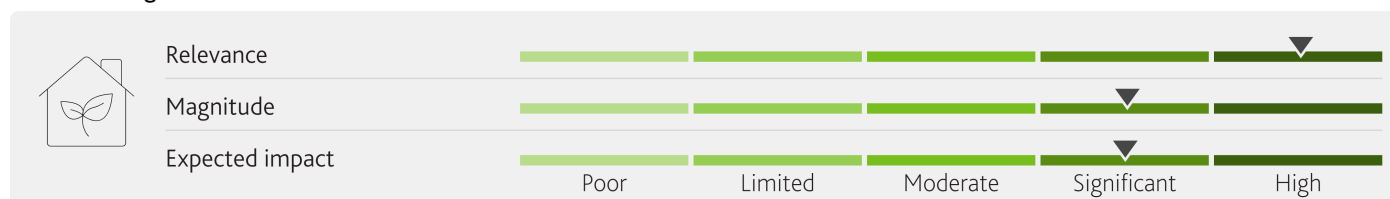


Under this category, the federal state plans to refinance expenditures mainly related to the expansion of broadband fiber-optic infrastructure in Baden-Wuerttemberg to reduce transmission network-related energy consumption. A smaller share of proceeds is allocated to promote the extension of energy-efficient heat networks, as well as R&D expenditures to raise awareness, and inform and support communities and businesses about measures to increase energy efficiency.

The increase in the efficiency of energy consumption is significantly relevant in the region as the carbon intensity in electricity production in Germany (354 gCO₂e/kWh in 2021) is substantially higher than that in many of its neighboring countries and above the European average (280 gCO₂e/kWh in 2021)³. Although data transmission and ICT services are not considered among the most energy-intensive activities, the share of gigabit-capable transmission networks covers only around 60% of households in Baden-Wuerttemberg, which is slightly below the national average. In Germany, the share of households covered by fiber-to-the-home (FTTH) networks (around 15% in 2021) is significantly below the EU average (around 50% in 2021)⁴.

The magnitude of this category is significant. The extension of the broadband network with fiber-optic infrastructure is likely to generate long-term improvements in energy efficiency. Fiber optics' longer durability and more efficient energy consumption are likely to directly reduce ICT sector-related GHG emissions, and serve as an enabler for many other industries to reduce their energy consumption and carbon footprints. The associated negative environmental and social (E&S) externalities are limited in scale and are likely to be managed appropriately. However, increased data transmission capacities are likely to lead to increased data traffic. Although energy consumption per unit of data transferred will decrease, the overall energy consumption might increase in absolute terms, reducing or eliminating the positive impact directly associated with transmission networks. Beyond the extension of broadband infrastructure in Baden-Wuerttemberg, we expect the other projects financed under this category to have positive impacts on energy efficiency. Also, although the technical thresholds are not always clearly defined and the financed types of renewable energy can include large-scale geothermal, we positively view the fact that the national requirements in terms of energy efficiency are likely to be overachieved.

Green buildings



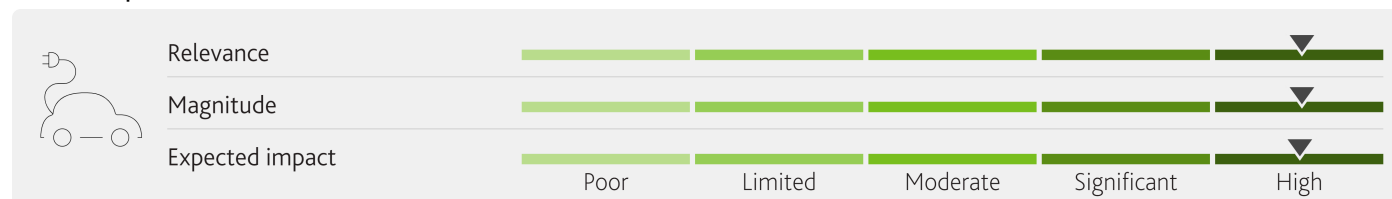
The federal state plans to refinance expenditures related to increases in energy efficiency in public buildings or social housing through new construction, acquisitions, or restructuring measures.

The need for more efficient buildings in Germany is particularly high given the building sector is the largest emitting sector in the country with around 40% of total CO₂ emissions⁵. In Baden-Wuerttemberg, the building sector is the third-highest CO₂-emitting sector, accounting for around 24% of total CO₂ emissions⁶.

The magnitude of this category is significant. Newly constructed buildings meet the primary energy demand (PED) threshold of at least 10% below the threshold set in the requirements for ultralow energy buildings and the minimum energy requirements are documented through Energy Performance Certificates (EPCs). However, a transparent life cycle assessment (LCA) including the construction stages and not just the operation stages, would be beneficial to ensure high expected environmental impacts are included throughout the life of the buildings. This is of particular importance as most of the funds will be allocated to the construction of new buildings that will come with lock-in effects. With regards to the renovation of buildings, the issuer confirmed to comply with a reduction in PED of at

least 30%, compared with the energy performance of the building before renovation, as required by recognized international standards. Acquisitions of already energy-efficient buildings contributes to the transition of the building sector to a lesser degree compared to acquisitions and upgrades of less energy-efficient buildings.

Clean transportation

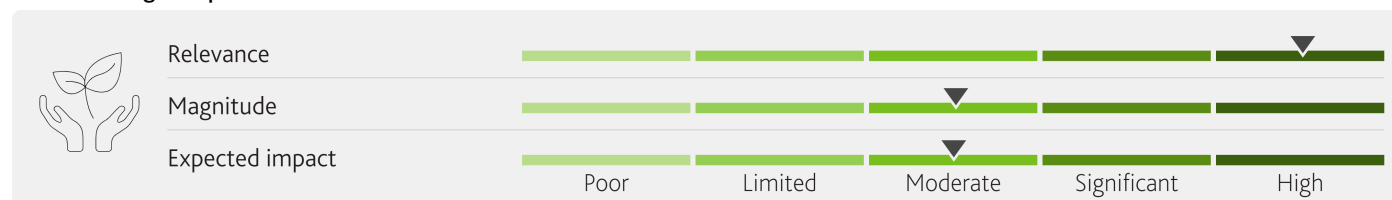


This category comprises 13 projects. The drivers of the category are linked to the promotion of the electrification of public mass transport, electromobility and related infrastructure, as well as infrastructure for emissions-free modes of transport such as cycling.

Clean transportation investments are highly relevant in the region. According to the study "Mobility in Germany"⁷ commissioned by the Ministry of Transport, 10% of daily mobility in Baden-Wuerttemberg was by bicycle and 10% by public transportation, but 60% was by car in 2017. The state agency for mobility in Baden-Wuerttemberg stated that in 2023, around 90% of the car fleet was fossil fuel powered⁸, although the number of new admissions of zero-tail pipeline vehicles is increasing.

The magnitude of this category is high, as all projects offer the best possible solutions to promote clean transportation. All projects related to the development of zero-tail pipe vehicles, electrified trains, and soft mobility are aligned with the most stringent standards available to address reductions in CO₂ emissions. Funding of personnel in the field of sustainable mobility is a basic prerequisite for implementing key measures to enable the transformation process of Baden-Wuerttemberg toward climate neutrality. Most R&D activities that potentially mitigate environmental pollution by avoiding fossil fuel emissions are also aligned with best market practices. Projects to fund public walking and bicycle infrastructure are automatically eligible. Note that the overall benefits of this category are dependant on the electricity mix of the country, where a high-carbon content electricity mix would entail a lesser benefit from transport electrification related projects. This is the case of Germany, where the carbon intensity in electricity production (354 gCO₂e/kWh in 2021) is substantially higher than that in many of its neighboring countries and above the European average (280 gCO₂e/kWh in 2021)⁹.

Climate change adaptation

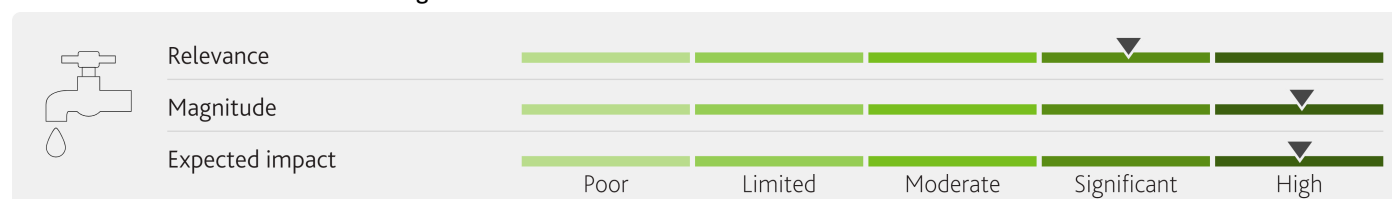


This category comprises three projects limited to expenditures related to timber construction, measures aiming at the development of climate-resilient forests or (re-)afforestation, and a funding program to implement adaptation measures for climate change and perform R&D, as well as awareness-raising activities.

Climate change-related projects are highly relevant in the context of decarbonization needs in the building sector and the need for raising awareness among the population about climate change impacts and the impact of complex influencing factors on forests. The federal government's 2022 analysis estimated that the building sector was one of the few sectors in Germany that failed to meet the permitted annual CO₂ emission volume according to the Federal Climate Protection Act ¹⁰. Almost 40% of Baden-Wuerttemberg is covered with forests¹¹. Climate extremes and the unfavorable nutritional soil status, combined with a high incidence of various pests, led to increased forest damage in the past. As of 2022, 46% of Baden-Wuerttemberg's forest area was significantly damaged¹². To address this challenge, the federal state intensively promotes the sustainable use of forest resources. The development of sustainable construction models will support the decarbonization of the building sector, and additional research and advisory services are needed to develop a collective understanding of the various impacts of climate change.

The magnitude of this category is moderate because of the net impact of timber construction, where more than two-thirds of the proceeds will be allocated. Timber construction projects enable the reduction, substitution and compensation of emission-intensive and climate damaging construction materials such as concrete (25% global warming potential [GWP] reduction¹³; lower environmental impacts from timber constructions in comparison to concrete buildings¹⁴). The timber initiative financed under this category strives to use regional wood, which is linked to certificates of origin and cooperation with local networks for sustainable forestry, also resulting in short transport routes, which mitigates many of the potential negative externalities. However, next to some remaining externalities (e.g., the application of chemical additives), the lack of eligibility criteria to ensure that high environmental standards are implemented throughout the life cycle of the buildings limits our insight into the scope of the expected environmental benefits. The reforestation project is sustainably managed through a forest management plan per the Administrative Regulation of the Ministry of Rural Affairs and Consumer Protection on the Granting of Subsidies for Sustainable Forest Management. In addition, it has long-term positive impacts linked to decarbonization and the creation of CO₂ sinks without any lock-in effects.

Sustainable water and wastewater management

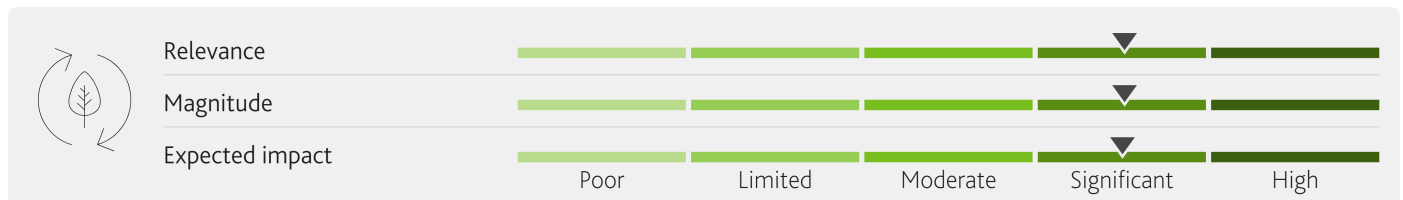


This category comprises two projects related to the refinancing of expenditures for the operation and maintenance of sustainable water, and wastewater treatment projects.

By financing expenditures related to the operation and maintenance of sustainable water, and wastewater treatment projects, Baden-Wuerttemberg addresses an important and basic need, although slightly less relevant in the local context because the sewerage infrastructure and the drinking water supply structure are already well developed, especially when compared on a global scale. Germany is the European country where the most wastewater is reprocessed and thus recycled¹⁵. Additionally, according to the regional office for the environment of Baden-Wuerttemberg, in 2021, the the public sewerage system connection rate was more than 99%, and the wastewater treatment in the state was at a high level. However, wastewater treatment plants have not yet achieved "good ecological status". In particular, nitrogen removal performance is unsatisfactory.

The magnitude of this category is high. Both projects are likely to generate a positive long-term impact on the sustainable use of water and wastewater management, and reduce negative effects from pollution in the future. The infrastructure for municipal water supply, including water pipelines/canals, water treatment plants, waterworks and reservoirs, are being technically upgraded with state-of-the-art technologies and structurally developed in such a way that a secure water supply is ensured even in times of climate change. Sewerage infrastructure investments ensure the protection of the environment by reducing substance inputs from municipal wastewater into water bodies through proper wastewater disposal in line with the legal requirements. Both projects are expected to comply with national German and European water management regulations, as well as the Drinking Water Ordinance. This provides assurance on the mitigation of potential negative environmental externalities because of the lack of detailed thresholds or definitions for the technologies used.

Circular economy adapted products, production technologies and processes, and/or certified eco-efficient products

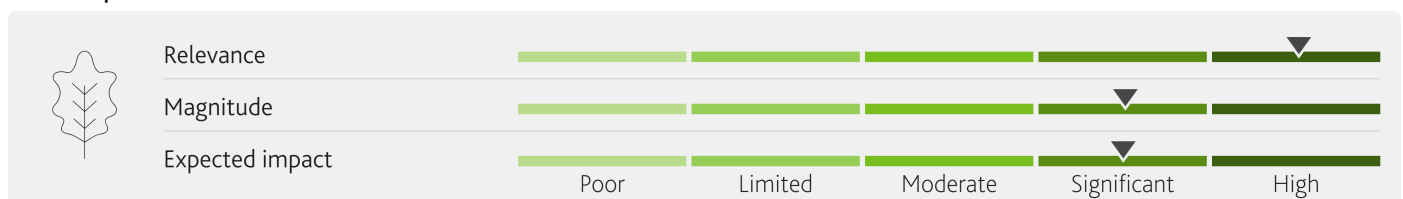


This category comprises six projects linked to the reduction of the use of raw materials and public procurement of sustainable products with a resource efficiency focus.

Projects included under this category address significantly relevant issues associated with waste generation considering the local context. Domestic raw material consumption in Germany is still almost twice as high as the international average of 12.2 tons per capita and year¹⁶. However, Germany has robust recycling systems and high levels of innovation in circular economy sectors¹⁷. Particularly, national and local regulation require high technical standards and the landfill is banned for untreated waste, promoting waste disposal as reliably and as environmentally friendly as possible in Germany.

The magnitude of this category is significant. R&D activities, production technologies, and processes suitable for the circular economy and certified eco-efficient products, as well as measures to reduce primary raw materials, are aligned with internationally recognized standards and are likely to have positive long-term impacts. However, for some projects within this category, such as R&D activities to recover alloys from the nuclear industry, the actual climate impact is assessed to be somewhat limited, and the existence of potential lock-in effects or negative environmental or social externalities cannot be ruled out. For example, for plants built for phosphorus recovery from sewage sludge, no concrete specifications or requirements for energy efficiency levels were set. In terms of waste management, we lack visibility into the management of non-recyclable and hazardous residual components, although the issuer commits to recycling most of the materials. On the other hand, the promotion of industrial dismantling of battery modules and electric motors will not result in any process-related CO₂ emissions, and the GWP will be reduced by a factor of 10-20 compared with conventional metallurgical processes. In addition, water consumption will be limited to a single-step process. Also, the bioeconomy strategy of the federal state, to which most of the proceeds associated with this category will be allocated, is likely to provide significant long-term benefits related to the transition to a circular economy.

Pollution prevention and control



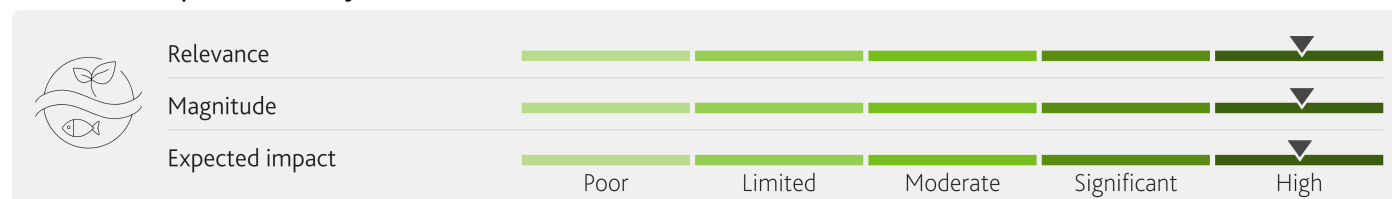
Under this category, Baden-Wuerttemberg allocated most of the proceeds to the remediation of contaminated sites. The remainder of the proceeds is allocated to projects that promote the modal shift in transportation toward public transportation and low- or zero-emission vehicles.

Pollution prevention and control are highly relevant to protect biodiversity and human health, and preserve valuable land. In Germany, most of the soil contamination is related to the civilization and increased industrial activity over the last 150 years. Contamination is usually higher in industrial areas and areas with a lot of road traffic. On a national level, the Federal Soil Protection Act (Bundes-Bodenschutzgesetz) aims to promote the remediation of contaminated sites, holding the federal states responsible for the recording, assessment and remediation of areas that pose a danger to human health and the environment. In addition, in Baden-Wuerttemberg, 60% of GHG emissions are related to cars, which make up more than 80% of all kilometers traveled in the federal state¹⁸. For comparison, only around 5% of the kilometers are traveled via public road transport. This number is supposed to double by 2030 under the state's Public Transport Strategy 2030, from a 2010 baseline.

The magnitude of this category is significant. The appropriate treatment of contaminated sites in alignment with national legislation is likely to create a positive long-term impact. However, there is limited insight into the techniques applied to remediate contaminated

areas, as well as into their future use, which explain the significant magnitude score. In addition, the promotion of low- and zero-emission modes of transport adhere to robust standards and technical thresholds. Note that a subset of activities base their expected impact on unconfirmed assumptions, such as an expected correlation between the degree of digitization in public transportation ticket systems and the use of public transportation.

Terrestrial and aquatic biodiversity conservation

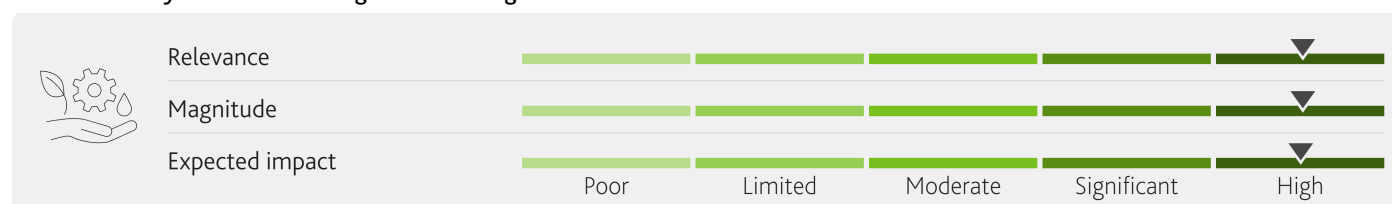


Projects financed under this category mostly address the protection and extension of natural habitats, and the preservation of biodiversity via, for example, the direct acquisition of land, nature conservation contracts, or investments in direct habitat conservation measures.

The loss of biodiversity is a highly relevant challenge in Germany, particularly in Baden-Wuerttemberg. The federal state counts around 1,040 nature reserves, which are equivalent to roughly 2.4% of the state's area¹⁹. This is significantly below the national average (6.3% of the country's area), indicating a need for improvements. In response to this and in alignment with the EU target to stop the substantial loss of biodiversity and promote positive development by 2050, Baden-Wuerttemberg has introduced its Nature Conservation Strategy.

The magnitude of this category is high. The financed projects are likely to have a highly positive long-term impact. The associated activities represent the best available solutions and are likely to lead to an increase in the share of land that is covered by nature reserves. A minority of proceeds will be allocated to the construction of a visitor and information center, which is likely to make a valuable contribution to raising awareness of the importance of the protection of natural habitats.

Environmentally sustainable management of living natural resources and land use



Most of the proceeds allocated to this category are associated with professional pruning to increase the resilience and life expectancy of meadow orchards, the promotion of organic farming practices to protect and restore biodiversity, and the acquisition of land and implementation of associated upgrades to promote the creation of biotopes.

The sustainable management of natural resources is of high relevance in Baden-Wuerttemberg where around 45% of the land is devoted to agriculture²⁰, of which 14.5% is cultivated organically (equivalent to roughly 13.5% of farms)²¹. This is more or less in line with the national average (14.0% of farms or 10.9% of arable land managed organically). Through its biotope mapping exercise, the state classified around 40% of its biotopes as endangered and another 4% as severely endangered, which indicate the increased need for additional measures for the protection and restoration of biodiversity and ecosystems.

The magnitude of this category is high. The financed projects are likely to have a highly positive long-term impact on the protection and restoration of biodiversity and ecosystems in Baden-Wuerttemberg. The best available solutions are applied, which is likely to lead to the increased resilience of local biotopes and an increase in the share of organic farming without significant associated negative externalities.

ESG risk management

We have not applied a negative adjustment for environmental, social and governance (ESG) risk management to the expected impact score. At the federal level, Germany is a Designated Country under the Equator Principles²², a signatory of all the major UN human rights conventions (including the UN Guiding Principles on Business and Human Rights) and the OECD Guidelines for Multinational Enterprises, which assures that the Land of Baden-Wuerttemberg is required to sufficiently address the management of most of the ESG risks. In addition, on the federal state level, with regard to environmental risks, the State Parliament of Baden-Wuerttemberg passed the Climate Protection and Climate Change Adaptation Act²³ in February 2023, which complies with the requirements of the Federal Constitutional Court. The state government regularly monitors the achievement of climate protection goals. Furthermore, Baden-Wuerttemberg has established the Environmental Administration Act²⁴, which regulates Environmental Impact Assessments, Strategic Environmental Assessments, the right to environmental information, the environmental damage law, and the recognition of environmental associations. The conservation, restoration and sustainable use of biodiversity and ecosystems shall be actively supported via the legislative framework²⁵ of the federal state. In terms of business ethics, all green eligible projects are subject to public procurement, which includes mandatory evaluation criteria in terms of economic and financial capacity and technical and professional capacity.

Coherence

We have not applied a negative adjustment for coherence to the expected impact score. The Land of Baden-Wuerttemberg has formalized its sustainable development strategy, committing to environmental protection, including managing water resources; minimizing environmental impacts from energy use, transportation, construction and the rehabilitation of public buildings; and addressing various biodiversity issues. Baden-Wuerttemberg has also committed to reducing its GHG emissions to 65% by 2030 and 95% by 2040 compared with the total emissions of 1990.

The green bond framework and the associated eligible expenditures portfolio coherently align with Baden-Wuerttemberg's strategic sustainability priorities and contribute to the realization of its environmental commitments and goals. In addition, the Land of Baden-Wuerttemberg is contributing to Germany's goal to reduce its GHG emissions by at least 55% by 2030 and achieve complete GHG neutrality by 2045²⁶.

Appendix 1 - Mapping eligible categories to the United Nations' Sustainable Development Goals

The 10 eligible categories included in the Land of Baden-Wuerttemberg's framework are likely to contribute to eight of the UN's SDGs, namely:

| UN SDG 17 Goals | Eligible Project Category | SDG Targets |
|---|--|---|
| GOAL 2: Zero Hunger | Environmentally sustainable management of living natural resources and land use | 2.4: Ensure sustainable food production systems that improve productivity, support ecosystems and climate change adaptation |
| GOAL 6: Clean Water and Sanitation | Sustainable water and waste management | 6.1: Achieve universal and equitable access to safe and affordable drinking water 6.3: Improve water quality by reducing pollution, eliminating dumping and minimizing hazardous chemicals and materials |
| GOAL 7: Affordable and Clean Energy | Renewable energy Energy efficiency Green buildings | 7.2: Increase substantially the share of renewable energy in the global energy supply 7.3: Double the global rate of improvement in energy efficiency |
| GOAL 9: Industry, Innovation and Infrastructure | Circular economy adapted products, production technologies and processes, and/or certified eco-efficient products Pollution prevention and control | 9.5: Enhance scientific research, upgrade the technological capabilities of all countries, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and increasing private research and development spending |
| GOAL 11: Sustainable Cities and Communities | Clean transportation Clean transportation Sustainable water and waste management Pollution prevention and control | 11.2: Provide access to safe, affordable, accessible and sustainable transport services for all 11.6: Reduce the adverse per capita environmental impact of cities, with particular attention to air quality and waste management |
| GOAL 12: Responsible Consumption and Production | Circular economy adapted products, production technologies and processes, and/or certified eco-efficient products Pollution prevention and control Environmentally sustainable management of living natural resources and land use | 12.2: Achieve the sustainable management and efficient use of natural resources 12.5: Substantially reduce waste generation through prevention, reduction, recycling and reuse |

| UN SDG 17 Goals | Eligible Project Category | SDG Targets |
|-------------------------|--|--|
| GOAL 13: Climate Action | Renewable energy Energy efficiency Green buildings Clean transportation Climate change adaptation | 13.1: Strengthen resilience and adaptive capacity to climate-related risks and natural disasters in all countries |
| GOAL 15: Life on Land | Environmentally sustainable management of living natural resources and land use Terrestrial and aquatic biodiversity conservation | 15.5: Reduce the degradation of natural habitats and biodiversity loss, the extinction of threatened species 15.A: Mobilize and increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems |

The mapping of the UN's SDGs in this SPO takes into consideration the eligible project categories and associated sustainability objectives documented in the issuer's financing framework, and the resources and guidelines from public institutions, such as the ICMA's SDG Mapping Guidance and the UN's SDG targets and indicators.

Appendix 2 - Summary of eligible categories in the Land of Baden-Wuerttemberg's framework

| Eligible Project Category | Description | Sustainability Objectives | Impact Reporting Metrics |
|---|--|----------------------------------|---|
| Renewable energy | Expenditures relating to the production, acquisition, operation, distribution and transmission of renewable energy with emissions of less than 100g CO ₂ /kWh. | Climate change mitigation | - GHG emission reduction (tCO ₂ e) - Generated liquid hydrogen (in tons) - Number of researchers in improved infrastructure |
| Energy efficiency | Expenditures linked to energy management development to increase energy efficiency at industry, public and service buildings. Funding of enabling technologies for shift to energy intensive future. | Climate change mitigation | - GHG emission reduction (tCO ₂ e) - Energy savings from network access compared to conventional connector - Length of supported line meters (in networks) (km) - Number of researchers in improved infrastructure |
| Green buildings | New buildings built after 31 December 2020 with energy performance at least 10% better than the threshold for Zero-Energy Buildings ("NZEB") in the local market and building renovations that meet current requirements for major renovations. | Climate change mitigation | - GHG emission reduction (tCO ₂ e) |
| Clean transportation | Expenditures intended to support the development and maintenance of vehicles and infrastructure needed for mobility of personal and mass public. | Climate change mitigation | - GHG emission reduction (tCO ₂ e) |
| Climate change adaptation | Expenditures to increase the resilience of eco-systems infrastructure measures to address drought, desertification, extreme weather events, rising water levels, declines in agricultural productivity, forest fires, epidemics, pests ; loss of biological diversity and ecosystem services resulting from global temperature increases. | Climate change adaptation | - Improvement of climate resilience and carbon dioxide balance of forests - Increase in scientific knowledge on transformative research and municipal sustainable concepts - Increased surface area of forests adapted to climate change (in square meters) - Number of approved timber building |
| Sustainable water and wastewater management | Expenditures relating to the development, construction, operation and maintenance of sustainable water, waste and wastewater management projects that contribute to the improvement of water supply, distribution and quality, sanitation as well as wastewater collection and treatment. All activities in line with national and EU recommendations (Federal Water Act § 57, Surface Waters Ordinance, EU Water Framework Directive) | Sustainable water management | - Improvement of water quality |
| Circular economy adapted products, production technologies and processes, and/or certified eco-efficient products | Expenditures linked to reduction of use of raw materials, public procurement of sustainable products with a resource efficiency focus. Additional exclusions: - No landfill activities - Biomass only, if part of a bigger value chain and/or if originates from non-hazardous or non-recyclable waste - Heating/cooling, and co-generation facilities using biofuel/biomass only, if energy conversion efficiency of achieved | Transition to a circular economy | - Water use reduction ³ (m ³) - Number of future employees in new research buildings - Future potentials of recovered phosphorus (in t/a) |

| Eligible Project Category | Description | Sustainability Objectives | Impact Reporting Metrics |
|---|--|---|---|
| Pollution prevention and control | <p>Expenditures linked to waste prevention, reduction, recycling projects inducing the collection, sorting, processing and conversion and treatment of waste respecting the waste hierarchy.</p> <p>Expenditures linked to reduction of air pollution via measures related to e-mobility, maintenance of leased vehicles, projects of public transport and air solutions.</p> <p>Additional exclusions: - Heating/cooling, and co-generation facilities using biofuel/biomass only, if energy conversion efficiency of achieved</p> | Pollution prevention and control | <ul style="list-style-type: none"> - Environmental and health hazards reduction - Capacity usage of express bus lines number of passengers (in %) - Zero CO₂ and NO_x emissions (by using motorcycles with an electric motor) |
| Terrestrial and aquatic biodiversity conservation | <p>Expenditures linked to restoration and rehabilitation of ecosystems (e.g. renaturation of banks, reopening of riparian planting of hedges).</p> <p>Expenditures linked to sustainable forest management adaptation of tree species to climate change, safeguarding forests), including afforestation, reforestation and rehabilitation of degraded forests.</p> <p>Expenditures linked to investments in protected areas in line with national and EU recommendations (Nature Conservation Act, Natura 2000).</p> | Protection and restoration of biodiversity and ecosystems | <ul style="list-style-type: none"> - Increased surface area of subsidized vineyards (ha) - Increased number of mapped/ updated biotopes - Number of individual projects and total incorporated total sum of areas per year - Number of visitors and number of companies (in the new building of the visitor and information center of the Black Forest National Park) |
| Environmentally sustainable management of living natural resources and land use | <p>Expenditures linked to preservation and sustainable use of terrestrial and aquatic natural resources that include, but are not limited to:</p> <ul style="list-style-type: none"> - Environmentally sustainable organic agriculture in line with EU Organic standard - Certified forestry in line with FSC, PEFC or equivalent | Protection and restoration of biodiversity and ecosystems | <ul style="list-style-type: none"> - Number of companies with organic production and surface area of organic production - Enhancing biodiversity - Preservation of resources |

Moody's related publications

Second Party Opinion analytical framework:

» [Framework to Provide Second Party Opinions on Sustainable Debt](#), October 2022

Topic page:

» [ESG Credit and Sustainable Finance](#)

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