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Swiss Confederation

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SWISS CONFEDERATION

GREEN BOND ALLOCATION AND IMPACT REPORT

CONTENTS

INTRODUCTION

The rationale for Green bond issuance

Sustainability in the financial sector is becoming increasingly important, both nationally and internationally. Financing the transition requires significant investments and the participation of the private sector is crucial. For the Swiss financial center, sustainability in the financial sector presents a considerable opportunity. The government primarily acts as mediator and facilitator in this context, cultivating an intensive dialogue with the financial industry and interested third parties to shape policies that are conducive to the growth in sustainable finance.

- The importance of sustainable financial investments has risen sharply across the financial industry. The Swiss Confederation has recognized the opportunities created by sustainable finance early on and has thus launched numerous initiatives: On June 24th, 2020, the Federal Council adopted a report and guidelines on sustainability in the financial sector and in November 2022, he has decided on measures that focus on greater comparable transparency and the integrity of sustainability claims made in the financial market. They include mandating larger Swiss companies in all sectors to implement the recommendations of the Task Force on Climate-related Financial Disclosure (TCFD). As part of the measures to increase the climate transparency of the sector, the Federal Council is recommending the use of the Swiss Climate Scores, a set of current and forward-looking indicators that constitute best practice transparency on the climate alignment of financial products and portfolios. Such climate scores can help provide guidance to investors in a comparable and science-based way on whether their investments are aligned with the key objectives of the Paris Agreement (PA), namely to reduce its greenhouse gas emissions to net zero.
- Since 2017, the Federal Office for the Environment (FOEN) and the State Secretariat for International Finance (SIF) have encouraged Swiss pension funds, insurance companies and since 2020 additionally banks and asset managers to participate in voluntary and free tests of their portfolios' alignment with the objective to reduce their greenhouse gas emissions to net zero using the Paris Agreement Capital Transition Assessment (PACTA) methodology. The most recent climate test took place in 2022, following previous assessments in 2017 and 2020. In 2022, 133 banks, asset managers, pension funds and insurance companies participated and tested the climate compatibility of their global equity, bond and real estate/mortgage portfolios.
- In order to accelerate the green transition, external costs of environmental and climate damage from economic activities in the real economy need to be internalized. Switzerland continues to advocate at the international level that greenhouse gas emissions should be appropriately priced. In line with international progress, sustainable finance efforts to date have particularly focused on climate change. Progressively, the Swiss Confederation intends to expand sustainable finance efforts to other environmental-related Sustainable Development Goals.

To bolster Switzerland's commitment to sustainability and to establish its financial center as an international leader in sustainable financial services, the Federal Council decided in November 2021 to include Green Confederation Bonds in its funding strategy. The Federal Council also aims to further increase transparency about public green expenditure and its impact. Given that parliament ultimately has to approve any type of expenditure, sovereign green bonds do not lead to more environmental projects and spending. Nonetheless, the Green Confederation Bond is expected to have numerous benefits, such as strengthening the application of international green bond standards in Switzerland, providing investors with an additional sustainable asset class and encouraging the issuance of further green

bonds by private and public players. This in turn will enhance the competitiveness of the Swiss financial center in sustainable finance and could also lead to more investments and projects with a positive environmental impact over time.

Switzerland's climate objectives and strategies

As an Alpine country, Switzerland is experiencing climate change directly. The annual average temperature in Switzerland has risen by around 2.0° Celsius since 1864, which is about twice the global average. Switzerland has experienced substantial loss of glaciers. Furthermore, it can expect summers to become drier and extreme weather events, like heat waves, to become more frequent. Biodiversity in Switzerland is in an unsatisfactory state and continues to decrease; habitats are becoming more and more similar (e.g. pastures) and about half of all habitat types in Switzerland as well as assessed native species are vulnerable or near-threatened.

According to the Intergovernmental Panel on Climate Change (IPCC) global CO_2 emissions must be reduced to net zero by the middle of this century at the latest to ensure sufficiently high probability of global warming remaining below 1.5° Celsius. In 2015, the international community adopted the PA to achieve this objective. Furthermore, the objective to increase the ability to adapt to impacts and foster climate resilience as well as to make financial flows consistent with a low carbon and climate resilient pathway, were adopted. Switzerland ratified the PA in 2017.

In response to the challenges and its international commitment, Switzerland has established robust environmental strategies and objectives to transform its economy towards a low carbon, resource-efficient and sustainable economy. In 2019, the Federal Council set the objective of zero net greenhouse gas emissions by 2050. Less than two years later, the Federal Council adopted the long-term Climate Strategy to 2050. It outlines ten strategic principles and provides climate goals and emission pathways for the buildings, industry, transport, agricultural and food sectors, financial markets, synthetic gases, aviation and the waste industry. It also determines the requirement for negative emissions, meaning that any CO_2 still emitted by 2050 will be fully and permanently removed from the atmosphere through sinks. The CO_2 Act provides the legal basis for the necessary measures. A revised version of the Act is expected to enter into force in 2025. Furthermore, on 18 June, the Swiss electorate approved the Climate and Innovation Act (KIG), which can be understood as a framework law that legislated the goal of climate neutrality for Switzerland by 2050. While the CO_2 Act is (expected to have) a duration of 5 years the new act has a duration until 2050 and provides the legal basis for additional measures for the gradual reduction of Switzerlands CO_2 consumption, more specifically, incentives for indoor climate heating and innovative technologies.

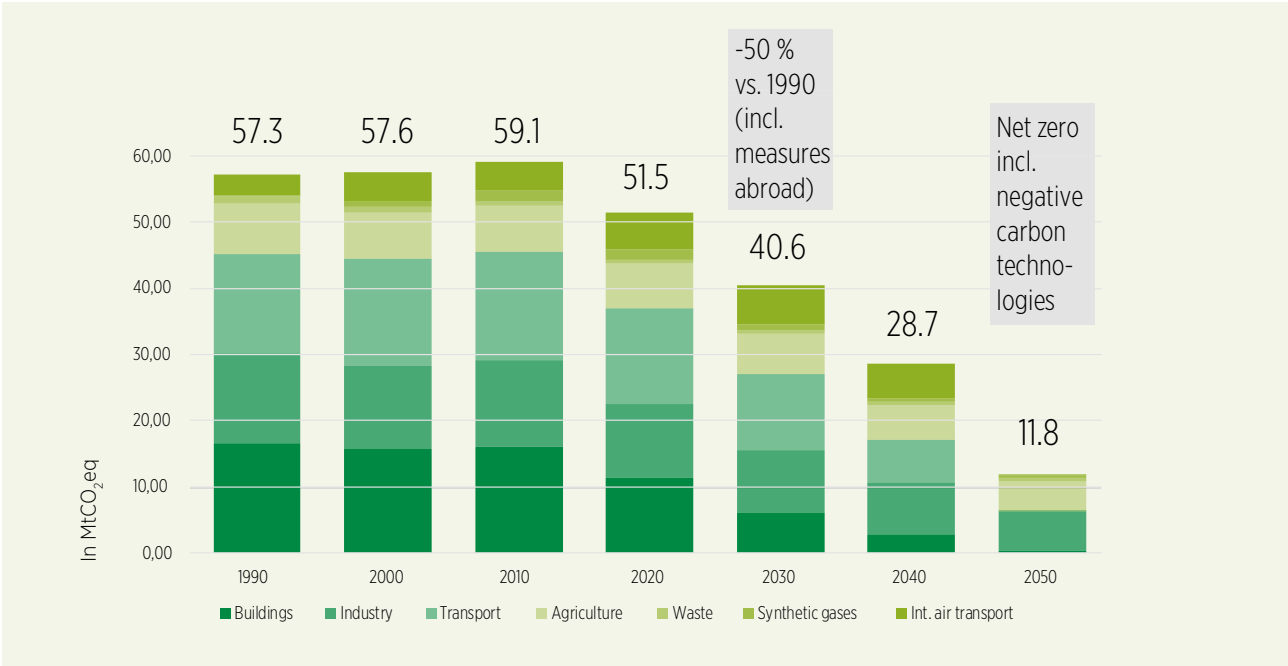
In response to the biodiversity related challenges and its commitments under the Convention on Biodiversity, Switzerland adopted a Biodiversity Strategy in 2012 and five years later an Action Plan for the period 2017–2023. The Action Plan is currently being updated for the subsequent period taking into account the latest developments.

The Federal Council also assumes the commitments related to the 2030 Agenda for Sustainable Development and accepts its responsibility towards present and future generations; the 2030 Sustainable Development Strategy (2030 SDS) outlines the Federal Council's priorities to implement the 2030 Agenda over the next ten years. The 2030 SDS sets out guidelines for the Federal Council's sustainability policy and establishes sustainable development as an important requirement for all federal policy areas. The 2030 Agenda for Sustainable Development (2030 Agenda) with its 17 global Sustainable Development Goals (SDGs) provides the reference framework. Numerous strategies, action plans and measures exist in all policy areas and play an important role in implementing the 2030 Agenda and the 2030 SDS. The Federal Council has also adopted the 2021–2023 Action Plan on the 2030 SDS to fill remaining gaps and ensure greater cross-sectoral cooperation.

Sustainability is one of the main pillars of the Swiss financial market strategy adopted by the Federal Council in December 2020. The Swiss financial center plays

a key role and must effectively contribute to reach Switzerland's environment and sustainability objectives while at the same time improving its competitiveness. The overarching objectives are to align financial flows with climate objectives in accordance with Article 2.1c of the Paris Agreement as well as with biodiversity objectives and to establish Switzerland as a leading hub in sustainable finance.

Switzerland's CO_2eq emissions trajectory



Commitment to reporting

The Swiss Confederation is committed to ensure full transparency about the issuance of Green Confederation Bonds. Investors will be provided with an allocation and impact reporting annually until full allocation of proceeds. The reporting is based on the requirements of the International Capital Markets Association (ICMA) Green Bond Principles (GBP) and can be adjusted in the case of new requirements and developments regarding the content and type of reporting.

The Swiss Confederation follows, to the greatest extent possible, the recommendations presented in the ICMA Harmonized Framework for Impact Reporting (June 2021). Both the allocation and impact reporting will be published on the website of the Swiss Confederation in the year following each issuance. The impact report will be available publicly until bond maturity.

The allocation report shows that the proceeds have been allocated in accordance with the present Green Bond Framework's criteria for eligible green expenditures. The report includes general information about the issuance of the past year and a detailed list of allocated proceeds, including a break-down by type of expenditure. Moreover, the amount of total identified eligible green expenditures is also reported.

The impact report outlines the environmental impact achieved with the green expenditures allocated to the Green Bond proceeds. The report includes a detailed description of the allocated green expenditures and the environmental objectives of these expenditures. Specific impact and output results form the core of the report.

ALLOCATION REPORTING

Inaugural Green Confederation Bond

In October 2022, the Federal Treasury issued Switzerland's first sovereign green bond (CH0440081567, 1.50 % 10/26/38) as mandated by the Federal Council. The markets reacted favorably to the issuance of the first Green Confederation bond. There was considerable interest in the new instrument, with bids totalling 974 million Swiss francs. The Federal Treasury allocated 766 million Swiss francs at an annual yield of 1.47 %.

The new financing instrument will enable the proceeds to be allocated to green expenditures that have already been approved by Parliament, with a one-year lookback period. An analysis of the federal budget based on the 2021 state financial statements identified green expenditure of around 4.5 billion Swiss francs, primarily in the areas of public transport, biodiversity, international cooperation and research. Since the available green expenditures exceeds the Confederation's longer-term issuance volume and conventional bonds will continue to be issued, only some green expenditures will be allocated to Green Confederation bonds.

The framework adopted by the Federal Council during its meeting on 17 August 2022 forms the basis for issuing Green Confederation bonds. It shows how the bonds will be integrated into the Confederation's sustainability strategy, which green expenditures from the federal budget can be allocated to Green Confederation bonds and how these expenditures will be reported. When preparing the framework, the Confederation was guided by the GBP of the ICMA, which are considered the market standard internationally. The Confederation has also taken into account the EU Taxonomy to some extent despite not being subject to the regulation (i.e. the eligibility criteria for the eligible green expenditures criteria follow the substantial contribution criteria of the EU Taxonomy, on a best effort basis). ISS ESG was commissioned to provide an external review (ISS ESG in July 2022) of the framework.

In accordance with the selection process described in the framework, the proceeds from the issue have been linked to expenditures in the federal government budget that contributes to fulfilling Switzerland's environmental and climate objectives, the UN Sustainable Development Goals (SDGs) and the PA among others. This report presents how the proceeds are distributed among the different eligible areas of expenditure. The report also includes output and impact statements outlining the positive environmental impacts of the green expenditure if such information is available.

Allocation Overview

The Swiss Confederation issued the first Green Confederation Bond on October 12, 2022. With the first issue, it raised a total of 766.05 million Swiss francs. This is also the total outstanding volume of Green Confederation Bonds as of year-end 2022. These proceeds can be attributed to expenditures that are classified as green according to the categories described in the Framework. The 2021 State Financial Statements include approximately 4.5 billion Swiss francs in expenditures that meet these requirements. Issue proceeds represent approximately 17 percent of available eligible green expenditures in the 2021 State Financial Statements. Proceeds were managed according to the process defined in the Framework. No proceeds were allocated to expenditures that are excluded according to the Framework.

Issuance proceeds were only allocated to eligible green expenditures of the 2021 financial statement. The expenditures from the 2022 budget would also be eligible in principle. However, since the issuance volume was significantly lower than the eligible expenditures according to the 2021 state financial statement, the expenditures from the 2022 budget were not used. The green bonds have become an integral part of the Confederation's issuance program since the first issue. Therefore, the expenditures from the 2022 budget (respectively the 2022 state financial statement) can be allocated to the Green Confederation Bond issues in 2023. It should be noted that the allocation to the individual categories is not proportional to the total amount of eligible expenditures in the individual categories. This allows for a meaningful representation of the different areas of responsibility within the federal budget. This is especially true for the smaller categories in terms of volume, which nonetheless make an important contribution to achieving the federal government's sustainability goals.

The following table shows how the 2022 issuance proceeds are mapped to the available green expenditures from the 2021 state financial statement. In addition, each category shows which UN Sustainable Development Goals the expenditures correspond to and which expenditures were selected within each category. It's important to note that some of the total eligible green expenditures include expenditures (other budget items) to which no funds were allocated, as the total volume of green eligible expenditures exceeds the issuance proceeds.

Category	Eligible green expenditures (State financial statement 2021)		Responsible Federal office / Selected expenditures (budget item and name)	Allocation		SDG
	in CHF million	*in % of total eligible green expenditures*		*in CHF million*	*in % of total allocation*	
Clean transportation	3233	72.6 %	Federal Office of Transport / A236.0110 Deposit railroad infrastructure fund	445.35	58.1 %	
Agriculture, forestry, natural landscapes and biodiversity	879	19.7 %	Federal Office for Agriculture / A231.0234 Direct payments agriculture, biodiversity contributions	150.00	26.1 %	
			Federal Office for the Environment / A236.0123 Nature and landscape	25.00		
			Federal Office for the Environment / A236.0126 Revitalization	25.00		
Green buildings and energy efficiency	206	4.6 %	Federal Office for Buildings and Logistics / A201.0001 Investments (global budget)	64.70	8.4 %	
Renewable energy	0	0.0 %	No available expenditures in the 2021 state financial statements	0.00	0.0 %	
International cooperation	64	1.4 %	Federal Department of Foreign Affairs / A231.0330 Contributions to multilateral organizations	23.00	5.6 %	
			Federal Office for the Environment / A231.0322 Multilateral environmental funds	20.00		
Research, Innovation and awareness raising	72	1.6 %	Agroscope / A200.0001 Functional expenses (global budget)	13.00	1.7 %	
Total	**4454**	**100 %**		**766.05**	**100 %**	

Clean Transportation

(Share of total allocation: 58.1 %)

The federal government finances the operation, maintenance and expansion of the railroad infrastructure via the Railway Infrastructure Fund (RIF). With the RIF, the federal government is making an important contribution to keeping the Swiss rail network and its infrastructure efficient. The Swiss electorate approved the financing and expansion of the railroad infrastructure in 2014, thus laying the foundation for the creation of the fund. In addition to various earmarked revenues, which are excluded in the Framework, just under 50 percent of the RIF is financed from the general federal budget (equivalent to just under 2.6 billion Swiss francs in 2021). Under the Framework, the funds from the general federal budget are eligible for the Green Confederation Bonds. By crediting a part of the funds' expenditures to the Green Confederation Bonds, the Federal Council underlines the high importance it attaches to rail transport.

In total, approximately 445 million Swiss francs of the BIF expenditures are allocated to the first green bond. This category is thus clearly the largest in terms of eligible expenditures as well as in terms of the volume allocated to the proceeds of the issue.

Agriculture, Forestry, Natural Landscapes and Biodiversity

(Share of total allocation: 26.1 %)

Various expenditures in the area of biodiversity and sustainable agriculture are summarized under this category. For the allocation to the proceeds, we focus on the budget item of direct payments to agriculture sector, primarily to biodiversity contributions within this budget item. Over the years, many of the habitats in agriculture that are valuable for biodiversity have disappeared. Reasons include increasing mechanization and intensification of land use. With the biodiversity contributions, the federal government wants to counteract this development and financially compensate farmers for the adapted use of their land. In particular, the objective is to prevent the decline of priority species and valuable habitats on agricultural land and in summering. In total, 150 million Swiss francs of the total biodiversity contributions are allocated to the first Green Confederation Bond.

In addition to the biodiversity contributions in the area of agriculture, a part of the eligible expenditures of the Federal Office for the Environment (FOEN) are allocated to proceeds within this category. On the one hand, this includes the eligible expenditure in the "Nature and Landscape" budget item used to promote biodiversity, species diversity and landscape (including biotopes of national importance and mire landscapes of outstanding beauty, UNESCO World Natural Heritage sites). On the other hand, the FOEN makes contributions to the planning and implementation of measures for the revitalization of water bodies with the budget item "Revitalization" based on the Flood Protection Act. A total of 25 million Swiss francs each are allocated for Natural Landscapes and Revitalization to the first Green Confederation Bond.

Green Buildings and Energy Efficiency

(Share of total allocation: 8.4 %)

The federal government has a large real estate portfolio to house the civilian parts of the federal administration. Sustainability plays a major role in the management of the real estate portfolio, which comprises several thousand buildings and objects, and in particular in reducing greenhouse gas emissions and the environmental impact of pollutants. To achieve this goal, the federal government applies a combination of the three basic impact mechanisms: Higher efficiency (less energy per service provided), consistency (use of energy with lower impact), and sufficiency (lower services provided). In doing so, the federal government consistently relies on materials that release as few pollutants as possible into the biosphere over their entire life cycle. Specific examples include energy renovations that take into account the proper life cycle, the replacement of oil and natural gas heating systems, or the expansion of electricity and heat production on suitable infrastructure sites. The two projects with the largest eligible expenditures incurred in 2021 were assigned to the first Green Confederation Bond. These are the second and third stages of the expansion step for the construction of the new administration buildings in Zollikofen. Together, these expenditures amounted to just under 65 million Swiss francs.

International Cooperation

(Share of total allocation: 5.6 %)

Switzerland's international cooperation aims to reduce poverty, hardship and global risks and promote peace. One of the Federal Council's strategic goals is to combat climate change and its effects on the environment. Natural resources are to be managed sustainably. In recent years, Switzerland has steadily expanded its commitment to combating the advance of climate change and the associated impacts on millions of people. It does this in particular through contributions to multilateral environmental funds (including the Green Climate Fund (GCF) and the Global Environment Facility (GEF)). Expenditures of 43 million Swiss francs in this area are allocated to the first Green Confederation Bond.

Research, Innovation and Awareness raising

(Share of total allocation: 1.7 %)

In addition to concrete measures in the areas described above, the Swiss Confederation is also active in basic research in the field of sustainability. This includes, in particular, "Agroscope", the center of excellence for agricultural research, which makes a significant contribution to sustainable agriculture and the food industry, as well as to an intact environment, and thus to improving the quality of life. Research is carried out along the entire value chain of the agricultural and food industry. Furthermore, there are research programs in the field of energy research, energy efficiency and to increase the share of renewable energies within the Swiss Federal Office of Energy. In some cases, financial aid is paid to private-sector actors to support innovative projects at the development stage. 13 million Swiss francs of the first Green Confederation Bond are allocated to the eligible green expenditures from Agroscope.

ESG risk management

The identification and monitoring of ESG risks are important aspects when issuing green bonds. The processes within the federal administration and the Swiss legal system, as well as the direct democratic processes in Switzerland, ensure that all new federal legislation and projects are analyzed in detail. On the one hand any new law has to be assessed in terms of its expected impact on the environment. This assessment is part of the legislative process and done by the federal administration. On the other hand, there are many opportunities for third parties outside the administration (e.g. lower levels of government, political parties, interest groups) to influence the legislative process. These opportunities exist both before and after laws are passed by the Federal Council and Parliament. Since every federal expenditure must have a legal basis, this process is indirectly applied to all new expenditures.

The available green expenditures are reviewed at least once a year by an interdepartmental working group of the federal administration ("Green Bond Working Group", GWG). The FOEN and the Federal Finance Administration are represented in the working group. In addition, various offices of the Federal Administration that have potential green expenditures are consulted. The GWG will call on experts on specific topics to confirm, refute or raise points of attention in the verification of eligibility of new or current eligible expenditure. This process will ensure that any changes in underlying expenditures can be identified and assessed at an early stage and the eligible expenditures comply with the applicable framework. Potential ESG controversies will also be investigated as part of this review. In this context, the market standards are used as a guideline for eligibility. If there are relevant changes to the defined categories, processes or eligible expenditures, the framework will be updated.

The GWG has determined the allocation of available expenditures to green bond issue proceeds in collaboration with the relevant offices of the Federal Administration. In addition to the appropriate representation of the various categories of expenditure, care has also been taken to ensure that reporting is as meaningful and illustrative as possible. The GWG is responsible for the allocation and impact reporting. This report is compiled and published in the year following the issue of the Green Confederation Bonds. Consequently, in 2023, the present reporting on the allocation and impact relates to the green bond issued in 2022. The impact of the allocated expenditures is described in detail in the following part of this reporting.

OUTPUT AND IMPACT REPORTING

Reporting guidelines and limitations

The impact report outlines annually the environmental impact of the use of the Green Bond proceeds. The report includes both qualitative and quantitative measurements of output and impact generated over the reporting period on an ex-post basis.

Given the comparatively low issue volume of the inaugural Green Confederation Bond, only about one fifth of the total eligible green expenditures can be allocated to the bond proceeds. In order to still enable a meaningful reporting, where it seems appropriate or is not otherwise possible, the positive environmental impact of the total expenditure is described in the impact report and not only the expenditure that is actually allocated to the proceeds of the green bond. In other words, the impact reporting is based on a portfolio approach and aligns with the reporting requirements of the ICMA Green Bond Reporting Guidelines (June 2021). As the impact reporting is based on a portfolio approach, no estimates are provided about lifetime results or project economic life in years.

In order to nevertheless provide an insight into individual projects, the annual impact report contains selected case studies for individual categories of eligible expenditure. This year's report includes a case study for the categories clean transportation as well as green buildings and energy efficiency.

The remainder of this report is structured as follows: The next chapter summarizes the outcome and impact indicators for all categories of eligible expenditure in a table. The subsequent chapters contain a description of the expenditure and the impact achieved for each category. The reporting is based on the budget items of the federal government.

Summary of outputs and impacts

Category	Summary	Key indicator
Clean transportation	Highly positive impact of a safe, cost-effective, energy-efficient and largely greenhouse gas-neutral transportation thanks to an expanded and well-maintained railway infrastructure	• Share of electrified railway network • Passenger and freight transport performance • Modal split share of rail in transalpine combined transport
Agriculture, forestry, natural landscapes and biodiversity	Relevant and broad-based spending to strengthen and restore declining biodiversity, for example in agriculture and water bodies	• Hectares of sustainable agriculture • Kilometer of revitalized waterbodies
Green buildings and energy efficiency	Demanding building standards and high sustainability requirements help to sustainably accommodate the federal administration using green and efficient construction methods	• Heat consumption per m^2 • Energy demand oil heating and natural gas heating systems • Energy generated by PV
Renewable energy	No available expenditures in the 2021 state financial statements	
International cooperation	In order to fulfill its commitments under the international climate conventions, the Swiss Confederation participates in various international funds that contribute to positive environmental impacts of global significance	• Expected CO_2e avoided • Total beneficiaries • Hectares of natural resources improved
Research, innovation and awareness raising	Basic research in the field of sustainable agriculture leads to a higher awareness of environmental challenges and contributes to an intact nature	• Number of practie-oriented and scientific publications • Participation in specialist events

In general, for greenhouse gas emission related key impact indicators the emission factors of the Swiss greenhouse gas inventory have been used. [1]

[1] https://www.bafu.admin.ch/dam/bafu/en/dokumente/klima/fachinfo-daten/CO2_Emissionsfaktoren_THG_Inventar.pdf.download.pdf/Faktenblatt_CO2-Emissionsfaktoren_01-2023_DE.pdf

Clean transportation

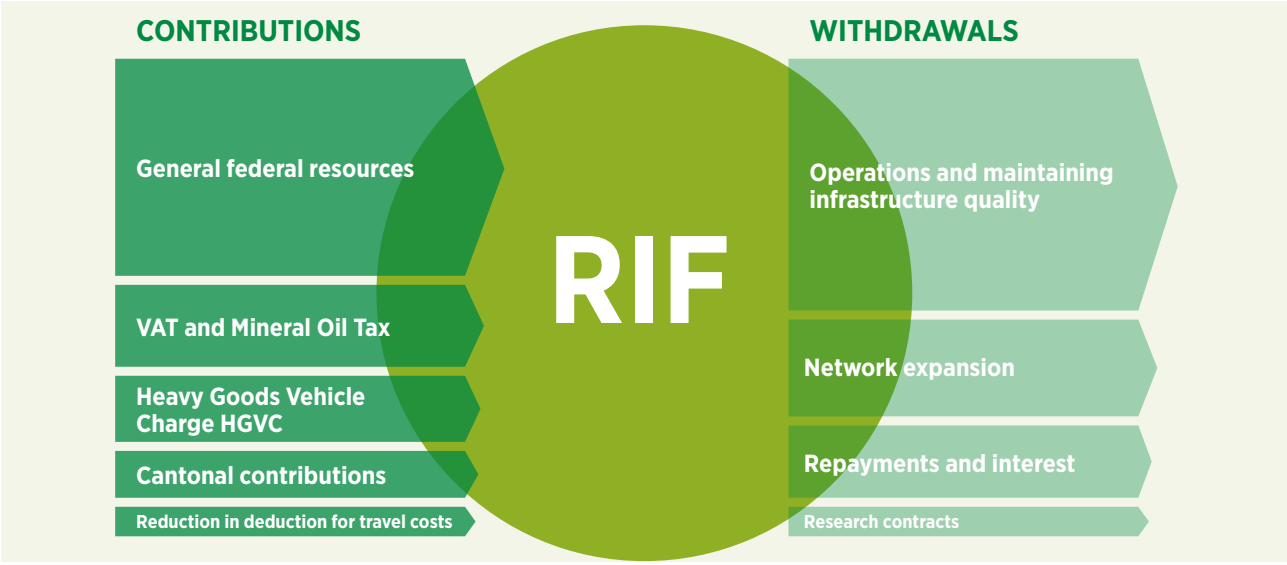
Financing of the rail infrastructure fund
(Federal Office of Transport, A236.0110 "Contribution to the railroad infrastructure fund")

In order to achieve the sustainability goals of the federal government, public transport plays a decisive role. In order for freight and passenger transport to increasingly take place by rail, an expanded and well-maintained railway infrastructure is of great importance. The rail infrastructure in Switzerland provides the population with a safe, cost-effective, energy-efficient and largely greenhouse gas-neutral transport alternative. At the same time, the rail network is used for a considerable part of daily freight transport, especially transalpine freight transport. In addition to the high use of this transport option, it is particularly noteworthy that almost all trains are electrically powered. The largest public transport company (Swiss Federal Railways, SBB), for example, runs virtually all trains on electric power, 90 percent of which is energy from hydropower.

To keep the railroad infrastructure up to date, regular investments and maintenance work are required. Switzerland finances the operation, maintenance and expansion of the railroad infrastructure via the RIF. The RIF is a legally independent fund with its own financial accounts. The RIF receives an annual contribution of around 5 billion Swiss francs (2021) from the federal budget, of which around half is financed by earmarked revenue. Until the end of 2020, the fund could additionally borrow from the Confederation. The debt (2021: 6577 million Swiss francs) is interest bearing and is expected to be repaid by about 2031. Two-thirds of the RIF's resources are used for the operation and maintenance of the railroad infrastructure. Around one billion Swiss francs per year is invested in the expansion of the rail infrastructure.

The funds for infrastructure maintenance have legal priority. In this way, the Swiss Confederation wants to ensure that the infrastructure remains in a well maintained and efficient condition. The gradual expansions will eliminate bottlenecks in the rail system, increase capacity at major rail hubs such as Geneva, Basel and Bern and expand the rail network. On the one hand, this will make it possible to absorb the rising demand for traffic (passenger and freight trains), and on the other hand, it will increase the range of public transport services. This includes, for example, the introduction of half-hourly or quarter-hourly service on frequently used sections of line. The RIF also provides funds for research contracts in order to clarify fundamental issues relating to the operation, maintenance and expansion of the railroad infrastructure.

Rail infrastructure fund (RIF)



Impact of the expenditure

Accurate impact measurement based specifically on the allocation of clean transportation expenditures to issuance proceeds is nearly impossible because only a relatively small portion of the funds used for rail infrastructure are allocated to the Green Bond. To consider the positive environmental impact of rail, the totality of this spending must be considered. In addition, the maintenance and expansion of the infrastructure is required by law. The impact of the very well-developed railroad infrastructure and the high use for passenger and freight transport undoubtedly has a high and positive effect on Switzerland's greenhouse gas emissions. For example, an analysis by the SBB shows that around 10 percent of Switzerland's total emissions are avoided each year thanks to the modal shift to rail.[2] This corresponds to around five million tons of CO_2 per year. In this context it is important to note that the Swiss railway network is already over 99 percent electrified. For example, SBB trains already draw 90 % of their energy from hydropower. The remaining 10 % is nuclear power. By 2025, all rail power is to come from renewable sources.

The following table shows how various metrics have been developed over time, also thanks to the investments of the Rail Infrastructure Fund (RIF). These metrics also illustrate the positive environmental impacts that can be achieved through rail infrastructure with economic development. It should be noted that not all of the federal government's contribution to the RIF can be attributed to the Green Confederation Bond, as about half is funded by earmarked revenues. In turn, of the total eligible expenditures to the RIF in 2021, less than 20 percent was allocated to the Green Confederation Bond. Accordingly, only a proportional share of the indicators shown can be considered an impact of the green bond. Furthermore, it should be emphasized that in addition to SBB, there are another 35 transport companies that transport passengers and goods on the Swiss railroad infrastructure and benefit from the investments of the RIF.

When analyzing the time series shown, it should be noted that mobility decreased significantly due to the COVID pandemic in 2020 and 2021.

Indicator	Unit	Status end 2019	Status end 2020	Status end 2021
Share of electrified railway network SBB only (Source: SBB)	%	100	100	100
Passenger transport performance (pkm) of railroad operators (Source: Federal Statistics Office)	Billion	21.831	13.379	14.349
Freight transport performance (net Tkm) of railroad operators (Source: Federal Statistics Office)	Billion	10.094	9.790	10.398
Greenhouse gas emissions from energy consumption SBB only (Source: SBB)	tCO_2	75 554	68 666	69 655
Course km in regional passenger transport (RPV) (Source: internal database Federal Office of Transport, data collected electronically from regional transport companies)	Million km	319.641	330.168	339.816
Modal split share of rail in transalpine combined transport (Source: Federal Statistics Office)	%	72.4	71.8	74.9

[2] Climate protection | SBB

Case study: Future development of rail infrastructure

The “Future development of rail infrastructure” expansion program involves investments of 5.4 billion Swiss francs throughout Switzerland. In 2021, a total of around 330 million Swiss francs was invested in the expansion program. The following two significant projects are worthy of particular mention:

- Modernization of Lausanne station at a cost of 1.3 billion Swiss francs. The modernization will be completed in stages in 2036/37.
- Construction of the fourth track Lausanne-Renens incl. flyover (0.3 billion Swiss francs). Commissioning December 2022.

The modernization of the Lausanne station will create a national mobility hub. The platforms will be upgraded to accommodate for 400-meter trains with additional seating. Access to the platforms will be facilitated and the pedestrian underpasses will be completely rebuilt. Three wider underpasses are planned to better distribute the flow of passengers. Connections to the metro lines and the station square will also be improved.

A fourth track has been laid between Lausanne station and the Prilly-Malley stop. Thanks to the new track, traffic on the densest section in western Switzerland can be handled more smoothly.

In 2021, investments totaling around 80 million Swiss francs were made for both projects.

Agriculture, forestry, natural landscapes and biodiversity

Biodiversity contributions for agriculture
(Federal Office for Agriculture / A231.0234 "Direct payments agriculture")

Biodiversity is the variety of life. It enables many ecosystem services, for example pollination, natural pest regulation or the provision of recreational space, from which the whole of society benefits. Over the years, many of the habitats valuable for biodiversity have disappeared due to agricultural activities. Reasons include increasing mechanization and the intensification of land use.

With the biodiversity contributions, the federal government wants to counteract this development and financially compensate farmers for the adapted use of their land. In Switzerland, around 42 800 farms and around 6700 summer pasture/alpine farms receive direct payments and biodiversity contributions. In particular, the objective is to prevent the decline of priority species and valuable habitats on agricultural land and in summering. In this way, the objectives and measures defined within the framework of the biodiversity contributions can also contribute to the achievement of environmental objectives in the field of agriculture. A total of around 435 million Swiss francs in biodiversity contributions will be paid out to farms in 2021 as part of the direct payment system in this area, accounting for 15 % of all direct payments to agriculture.

In fact, there are two types of biodiversity contributions that support the so-called biodiversity promotion areas (or BFF, in German): Famers are paid for the quality of the BFF, and/or for the connectivity of the areas. There are two levels of quality and accordingly levels of payments depending on the condition of the biodiversity in the area, more than half of the supported areas were of high quality in 2021. The payments for connectivity of an area are determined by how well the connectivity of ecosystems (or species habitats) in and between areas are secured. More generally, the biodiversity contributions seek to promote and accordingly reward the existence of extensive meadows and pastures, hedges, high trunk trees, and arable strips among others.

The quality contributions are fully financed by the federal government. In the case of the connectivity contributions, the federal government assumes a maximum of 90 % of the payment; the remaining share of financing is provided by the cantons, municipalities or private sponsors.

The biodiversity contributions are based on Article 73 of the Agriculture Act according to which the contributions support the conservation and promotion of biodiversity by agriculture.

Impact of the expenditure
Switzerland has been measuring and monitoring the impact of its agricultural practices on the environment since at least 1990. Thus, the Federal Office for Agriculture (FOAG) has been collecting information on a number of aspects including nitrogen and phosphorous cycles, biodiversity, soil, energy, and climate using internationally comparable indicators. The collected data and information allows the FOAG to assess the qualitative and quantitative impact of Switzerland's agricultural policy over the past three years. While initially all important environmental indicators improved, the performance over the past ten years has been more mixed. Greenhouse gas emissions from agriculture however, decreased. They stood at 6.5 million tCOe in 2021, almost 15% less than at the outset.

Also, the share of agricultural land supported with biodiversity contributions has been increasing; in 2021 a total of 190 000 hectares of agricultural land (19 % of the total agricultural land in Switzerland) and around 225 000 hectares of summer pastures in the Alps were supported with biodiversity contributions.

Indicator	Unit	Status end 2019	Status end 2020	Status end 2021
Agricultural land supported with biodiversity contributions in ha (and % of total agricultural land) (Source: Agrarumweltmonitoring, Federal Office for Agriculture)	ha (%)	190 381 (18.8%)	192 544 (19%)	190 669 (19%)
Number of high trunk field fruit trees (Source: Agrarumweltmonitoring, Federal Office for Agriculture)	#	4 280 746	4 295 702	4 333 853
Greenhouse gas emissions from agriculture (Sources: Agrarumweltmonitoring, Federal Office for Agriculture and Switzerland's greenhouse gas inventory, Federal Office for the Environment)	COte (million)	6.5	6.4	6.5

Nature and landscape

(FOEN / A236.0123 «Nature and landscape»)

The Swiss population cares about a healthy nature and landscape. Their beauty and diversity should also ensure a high quality of life and location in the future. The FOEN has multiple budget items including expenditure that meet the requirements of the framework and serve to achieve these objectives.

The expenditures in budget item "Nature and landscape" (2021: about 98.8 million Swiss francs) are used for measures in favor of biodiversity (2021: 78.2 million Swiss francs or about 79 %) and landscape (2021: about 20.6 million Swiss francs or about 21 %). Based on the Federal Act on the Protection of Nature and Cultural Heritage, the federal contributions support the implementation by the cantons on the basis of program agreements. Of the total eligible expenditure, 25 million Swiss francs are allocated to the proceeds of the first Green Confederation Bond.

In the area of biodiversity, the eligible expenditure involves the planning, protection, enhancement and conservation of biotopes of national importance, mire landscapes of particular beauty and national importance, and other biotopes worthy of protection. In coordination with direct agricultural payments, contributions are paid to the agricultural sector for specific services. In addition, measures to promote biodiversity and habitat connectivity are supported.

In the area of landscape, federal expenditures are primarily used for measures in favor of landscapes and natural monuments of national importance, parks of national importance and UNESCO World Natural Heritage sites.

The budget item also covers support for conservation organizations operating throughout Switzerland, as well as research and training institutions for their activities in the public interest. Furthermore, some emergency measures in biodiversity are beeing financed via this budget item.

The legal basis for the expenditure is the Nature and Cultural Heritage Protection Act of 1. 7. 1966 (NHG; SR 451) and there in particular articles 13, 14, 14a, 18d and 23k NHG.

The expenditures contribute significantly to the preservation and promotion of biodiversity as well as to the quality-oriented further development of the landscape as a high-quality living, economic and cultural space. They serve to strengthen awareness and action competence for the promotion of biodiversity and landscape.

Impact of the expenditure

The program agreements (PA) with the cantons are geared towards effective implementation. The cantons are supported by the federal government throughout the entire cycle (goals and objectives, reporting, controlling and measures). Program objectives as well as performance and quality indicators are defined in the PAs. The cantons report to the federal government. On the basis of the controlling reports and on the basis of random samples, it is checked whether the PAs are being fulfilled as agreed.

The impact of the measures for the protection of biotopes of national importance is scientifically assessed by means of the Impact Monitoring Biotope Protection Switzerland (WBS). For this purpose, remote sensing and field surveys are carried out cyclically in all types of biotopes of national importance. This enables specific statements to be made about the condition and development of the areas studied.

Continuous monitoring is ensured in the area of biodiversity thanks to Biodiversity Monitoring Switzerland (BDM). The program has been running since 2001 and is based on cyclical sampling, which is carried out in a regular grid across the entire country. BDM thus provides insight into the state and development of biodiversity as a whole.

Basic monitoring in the area of landscape is carried out by the Monitoring Program Landscape Observation Switzerland (LABES). LABES uses around 30 indicators to record both the physical and the perceived quality of the landscape.

Monitoring Program LABES Selected indicators	Unit	Status end 2019	Status end 2020	Status end 2021
Annual change in urban greenery* (Source: Environmental Indicators and Biodiversity Indicators, Federal Office for the Environment)	%	-1 %	-0.9 %	-1.6 %
Areas designated for biodiversity** (Source: Environmental Indicators and Biodiversity Indicators, Federal Office for the Environment)	%	13.5 %	13.5 %	13.4 %

Selected indicators related to biotopes:
* Urban greenery is a characteristic element of urban landscapes. It is relevant to climate and biodiversity (cooling of cities; creation of biotopes)
** Proportion of the Swiss national territory designated for the conservation of biodiversity or specific species.

Indicatore Name	State	Trend
Agricultural area	☹	☹
Area reserved for promoting biodiversity	☹	☺
Fragmentation of landscapes	☹	☹
Greenhouse gas balance of land use	😐	
Installation-free zones		☺
Light emissions	☹	☹
Organically farmed area	😐	☺
Perceived beauty of the landscape	☺	☺
Perceived changes in the landscape	😐	
Sealed area	☹	☹
Settlement and urban area		☹
Special quality of the landscape	☺	☺
Urban greenery	☹	☹
Urban sprawl	☹	😐
Freight traffic, road		
Living space		
Motorised passenger transport		

Indicators of the Monitoring Program LABES

Revitalization
(FOEN / A236.0126 «Revitalization»)

At first glance, Swiss water protection is a success story. A differentiated analysis, however, shows considerable deficits in the management of Switzerland's water bodies. Great efforts are still needed both in the structure of streams, rivers and lakeshores and in water quality to achieve the best possible condition.

The watercourses in Switzerland have a high degree of obstruction. The background was to ensure flood protection and the creation of agricultural land in the 18th/19th to mid-20th centuries. For this purpose, wetlands were drained and watercourses were canalized and straightened. In addition, Swiss streams and rivers are highly fragmented, which prevents the free migration of fish.

Since the revision of the Water Protection Act (GschG in German) in 2011, the cantons are obliged to revitalize built-up or covered water bodies (rivers and lakeshores). The goal is to revitalize about a quarter of the obstructed watercourses in 80 years, which corresponds to a length of about 4000 km. The federal government is providing approximately 35 million Swiss francs per year for this purpose.

Based on the Water Protection Act, federal subsidies support implementation by the cantons on the basis of program agreements or as individual projects. The share of federal subsidies amounts to 35–80 %. The legal basis for the expenditures is the Water Protection Act of 24. 1. 1991 (GSchG; SR 814.20) and there the Art. 38a GSchG. The cantons have partially delegated the task to the municipalities or private parties.

Flood protection projects can also receive an additional subsidy from the GSchG if they significantly exceed the required ecological minimum.

The implementation of revitalization projects is intended to achieve the following goals:

- Restoration of the natural functions of obstructed or covered watercourse sections (watercourses and lakeshores) with structural measures.
- The measures will restore site-appropriate habitats in the aquatic, amphibian and terrestrial realms along the watercourses.
- The measures promote aquatic longitudinal connectivity.
- The measures promote natural bedload dynamics.
- The measures promote momentum.

As a result of watercourse corrections and obstructions, aquatic biodiversity is threatened and has the highest proportion of extinct or threatened species.

To stop and reverse this trend in aquatic biodiversity, revitalizations are necessary. Against the backdrop of advancing climate change, the implementation of revitalizations is all the more needed in order to make water bodies more resilient.

Impact of the expenditure

Revitalized water bodies provide habitat for many native species, both in the aquatic and amphibian realms, as well as in terrestrial riparian areas. Through dynamic processes and constantly emerging and changing habitats, specialized species can become established, whereas in built-up monotonous waters, generalists with unspecific habitat requirements become established.

With revitalization, obstructions are removed and the section of watercourse has a near-natural or natural character after implementation. This can be verified by ecomorphological mapping. The main goal of revitalization is to reverse the trend of aquatic biodiversity loss.

Impact monitoring is conducted to better understand habitat and biodiversity impacts and to make future revitalization efforts more effective. Impact monitoring is characterized by the following features:

- Since 2020, recordings have been made throughout Switzerland according to a uniform concept and methods.
- Before/after pictures are taken (interval between them several years)
- Abiotic and biotic indicators are assessed
- Not all projects are evaluated, but a budget is defined per canton from which the recordings are financed (approx. 30 % of the projects are evaluated)
- Results are periodically evaluated and recommendations for action are to be derived from them.

Indicator	Unit	Status 2011	Status end 2020	Status end 2021
Revitalized watercourse[*1] (Source: internal, Federal Office for the Environment)	km	0	182	196.6
Revitalized lake shore[*1] (Source: internal, Federal Office for the Environment)	km	0	8	8.3
Completed revitalization projects[*1] **(as of April 2023)** (Source: internal, Federal Office for the Environment)	#	26		

[*1] The calculations are made based on the information and data provided by the cantons. At the beginning of each year, the Federal Office for the Environment requests information on implemented rehabilitation projects from the cantons.

Green buildings and energy efficiency

(Federal Office for Buildings and Logistics / A201.0001 «Investments»)

The Federal Office for Buildings and Logistics (FOBL) is responsible for housing the civilian part of the federal administration. It provides the real estate for the federal offices and is responsible for its planning, construction, maintenance and operation.

In 2021, the FOBL's real estate portfolio comprised around 3000 properties and 1800 plots of land with an acquisition value of 7.6 and 1.8 billion Swiss francs respectively. Among other things, the FOBL is responsible for 40 000 office workplaces, 28 000 of which are located in the Bern area. As a resource office, the FOBL plays a key role in terms of sustainability within the federal administration and sets an example for the business community and the public. The FOBL is committed to implementing the principles of the Federal Council's SDS 2030 and the UN 2030 Agenda for Sustainable Development. It takes into account subordinate strategies such as the Energy Strategy 2050, the Climate Strategy, the Biodiversity Strategy and the Swiss Landscape Concept and is guided by generally applicable standards for sustainability. Furthermore, it follows the recommendations of the Coordination Conference of Construction and Real Estate Bodies of Public Builders (KBOB) and the Federal Procurement Conference (BKB).

In order to anchor the principle of sustainability centrally in the office, the FOBL adopted its sustainability strategy in 2019 and updated it in 2022. The understanding of sustainability here goes beyond the classic three sustainability dimensions. With an additional focus on processes, the FOBL continues to drive the consideration of sustainability aspects in its structures, activities and projects. In 2022, the FOBL also published its first sustainability report. With this report, it informs its stakeholders annually about its commitment, its achievements and its progress in the area of sustainability.

The Ordinance on Federal Real Estate Management and Logistics (VILB) obliges the FOBL to create and follow sustainable standards with regard to the construction, furnishing, management and operation of its real estate. In its directives on sustainable real estate management, the Federal Departement of Finance has defined eleven guiding principles in this regard. The Recommendation on Sustainable Real Estate Management and the fact sheet Sustainable Building Standard Switzerland (SNBS) 2.1 of the KBOB further specify these guiding principles.

For projects in Switzerland, the FOBL uses the SNBS as a planning basis. In accordance with the federal government's Model Energy and Climate (VEK) initiative, the FOBL aims for SNBS or Minergie-P/A-ECO® certification for new buildings. In doing so, it strives for the maximum possible use of renewable energies and equips all suitable areas with photovoltaic systems (PVA).

The FOBL is thus fulfilling its exemplary role in sustainable real estate management. In accordance with the Federal Council's mandate of September 2020, it is taking the measures from the implementation concepts for the Federal Administration Climate Package and taking into account the mandates of different parliamentary motions (10.3638 Energy efficiency and renewable energies in federal buildings as well as motions 19.3750 Energy autonomy of federal real estate and 19.3784 Energy autonomy of federal real estate – photovoltaic offensive).

Impact of the expenditure

The proceeds from the issuance of the Green Confederation Bond will be allocated to the two largest of around

200 construction projects of the FOBL according to the 2021 state accounts: The second (19.7 million Swiss francs) and third (45 million Swiss francs) stages of the new buildings in Zollikofen. These are new administrative buildings with around 2,200 workplaces, which will be built according to the SNBS and Minergie-P-Eco® standards.

The share of green bonds thus corresponds to approximately 20 % of the FOBL's total investments in 2021.

The second stage of the administrative buildings in Zollikofen received the platinum certificate in January 2022, the highest SNBS award. The platinum certificate is also being sought for the third stage.

From 2019 to 2021, three new FOBL buildings with an energy reference area of around 90 000 m^2 were certified according to MINERGIE-P®.

In the same period, two new FOBL buildings were certified according to the Swiss Sustainable Building Standard SNBS:

- In 2019, Building B at Guisanplatz 1 in Bern became the first construction project in Switzerland and a pilot project for SNBS building construction to receive platinum certification.
- The new federal administration building on Pulverstrasse in Ittigen was awarded the SNBS Gold Certificate in 2020.
- The SNBS certificates have been available in silver, gold and platinum levels since 2016. The SNBS takes into account all areas of sustainability in construction projects involving the economy, society and the environment on the basis of 45 indicators. Among other things, the energy consumption of a building, its life cycle costs, the flora and fauna of the surrounding area, mobility or regional value creation are evaluated.

The following information relates to the entire real estate portfolio covered by the FOBL's energy statistics that is limited to scope 1 and of which only a part is attributable to the green bond:

Indicator	Unit	End 2019	End 2020	End 2021	Target 2030
Heat consumption per m^2 (Source: Federal Office for Buildings and Logistics)	**kWh/m^2 Energy reference area**	69	63	58	–
Energy demand oil heating (Source: Federal Office for Buildings and Logistics)	**tCO_2/a**	3184	2441	2255	1326
Energy demand natural gas heating systems (Source: Federal Office for Buildings and Logistics)	**tCO_2/a**	6037	8470	5112	4085
Energy generated by PV (Source: Federal Office for Buildings and Logistics)	**GWh/a**	0.9	1.0	1.1	3.7

Case study: New construction of administration building Zollikofen

The proceeds from the issuance of the first Green Confederation Bond is allocated to the two largest construction projects of the FOBL according to the 2021 state financial statement: The second (19.7 million Swiss francs) and third (45 million Swiss francs) stages of the new buildings in Zollikofen (a municipality in the canton of Bern and a suburb of the city of Bern).

Objective: Sustainable accommodation of the federal administration

Measures: New administrative buildings with around 2200 workplaces in accordance with SNBS and Minergie-P-Eco® standards

Indicator:

2nd stage:	SNBS Certificate Platinum – achieved
3rd stage:	SNBS Certificate Platinum – targeted

Investment costs: 229.7 million Swiss francs (2nd stage: 99.7 million Swiss francs, 3rd stage 129.8 million Swiss francs) BKP 1–9

Construction period: 2018 to 2023

Commissioning second stage: 2021, third stage: 2023

International Cooperation

(FOEN, A231.0322 «Multilateral environmental funds» / Swiss Agency for Development and Cooperation, A231.0330 «Contributions to multilateral organizations»)

The Confederation contributes to various multilateral environmental funds, in particular the GCF, the GEF, the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF). Federal contributions co-finance projects and measures to protect biodiversity, restore nature, reduce pollution, and combat climate change in developing countries. Whereby the GCF focuses on climate change mitigation. LDCF and SCCF exclusively fund projects that strengthen climate change adaptation in the poorest developing countries and mainly in small island developing states, respectively. Only the GEF has a broader mandate and finances projects that address various environmental problems in different sectors. Namely, this concerns climate change, biodiversity, desertification, chemicals, waste and water

All four funds (GCF, GEF, LDCF and SCCF) serve the UN Framework Convention on Climate Change and the PA. The GEF also serves other multilateral environmental conventions, such as the Convention on Biological Diversity.

Switzerland influences the use of funds on two levels: on the one hand as a member of the environmental conventions, which regularly set and recommend programmatic guidelines, and on the other hand as a member of the respective councils of the various funds, which, among other things, must approve all major projects financed by the funds. The councils decide on the detailed programmatic content as well as on policy and governance issues of the various funds.

With a contribution of 150 million Swiss francs for 2020–24, Switzerland is one of the ten largest donors to the GCF. With a contribution of 155 million Swiss francs over the next four years (2022–26), Switzerland holds a 3.64 % share of the GEF burden and is thus a medium-sized donor.

With these contributions, Switzerland fulfills its obligations under the International Climate Conventions and contributes to environmentally sound, sustainable development in all developing countries. The effects of climate change and biodiversity loss are becoming increasingly visible and tangible. Switzerland has a strong interest in addressing these two crises, mitigating and halting the effects, and increasing the adaptive capacity of developing countries.

The contribution to the GCF comes from the budget item for development cooperation («Contributions to multilateral organizations»). The contributions to the other three funds come from the budget item for the global environment («Multilateral Environmental Funds»).

For two of the funds (GCF and GEF), Switzerland makes multi-year commitments and disburses them in regular tranches. Contributions to the other two funds are more variable.

Impact of the expenditure

The funds contribute to positive environmental impacts of global significance, such as reducing CO_2 emissions, restoring land, or protecting marine areas, directly benefiting many people in developing countries. The positive environmental impact is measured at the level of the projects financed by the funds. The disclosures generally correspond to the expected values. The data are granular. For example, beneficiaries are gendered and sub-indicators are added to each indicator.

The impact analysis focuses on the most meaningful indicators, namely the reduction of CO_2 emissions and the number of beneficiaries. To avoid any double counting, Switzerland reports only that part of the impacts that corresponds to its respective share of the burden in the different funds (e.g. 3.64 % in the GEF and 1.92 % in the GCF.

At the GEF, impact measurement is done using the GEF-8 Corporate Scorecard. This is a comprehensive report on the performance of the GEF during the GEF-8 period, i.e., the current GEF-8 cycle (2022–26). In particular, the scorecard reports on progress toward GEF-8 targets. It is published on a semi-annual basis. The GCF uses what it calls an Integrated Results Management Framework (IRMF) and continuously publishes expected CO_2 reductions and beneficiaries at the overall portfolio level.[3]

In the time period 2021, the approved projects had the following impact:

Indicator	Unit	From projects approved in 2021	Swiss share
Expected CO_2e avoided (Sources: internal, the Green Climate Fund (GCF) and the Global Environment Facility (GEF))	million metric tons CO_2e	1256.7	34.9
Total beneficiaries from all five results areas including biodiversity, climate change (mitigation and adaptation), chemicals, international waters, and land degradation (Sources: internal, the Green Climate Fund (GCF) and the Global Environment Facility (GEF))	million	258.2	7.2
Hectares of natural resources managed with improved low-emission or climate-resilient management practices (Sources: internal, the Green Climate Fund (GCF) and the Global Environment Facility (GEF))	million hectares	161.60	4.5

[3] The GEF resp. GCF Secretariat receive the data from the GEF agencies, GCF accredited entities respectively that implements the projects on the ground in the recipient countries with other international and local partners and bear the responsibility for the reporting of the data.

Research, Innovation and Awareness raising

Description and basis of the expenditure

Agroscope is the federal competence center for agricultural research and is affiliated with the FOAG. Agroscope makes a significant contribution to sustainable agriculture and food production as well as to an intact environment, and thus helps to improve the quality of life.

Agriculture uses natural resources with the aim of producing food, while at the same time exerting an influence on the environment and the other functions of the agroecosystem. Politicians and the society expect the agricultural and food industries to further improve their efforts to use resources sustainably and to reduce greenhouse gas emissions. Agroscope is devoting 13 million Swiss francs of its pure research funds of 95 million Swiss francs to four areas specifically dedicated to these issues, out of a total expenditure of 193 million Swiss francs. The expenditure regarding those four areas has been deemed eligible under the green bond framework. The four areas include

- Sustainability assessment
- Careful use of soil
- Promotion and use of biodiversity and habitats in the agricultural landscape
- Agriculture and Climate Change

International agreements, legislation and national policies based on them underpin the activities in these areas. The specific framework is provided by the federal government's research concept for agriculture and the food industry, which is revised every four years.

In the area of *"sustainability assessment",* the activities are based on the Ordinance on the Assessment of Sustainability in Agriculture. This involves a systematic assessment of sustainability and eco-efficiency and how this can be improved in agricultural production. These analyses show which production methods are economically efficient and best conserve natural resources. They thus contribute to site-adapted optimization and a reduction in environmental impact.

The basis of research activities in the field of *"careful use of soil"* can be found in the Environmental Protection Act, the Swiss Soil Strategy and the Ordinance on Soil Pollution. Agricultural soils in Switzerland are exposed to hazards and stresses that lead to a decrease in their fertility and to losses of land. In order to counteract the negative developments, a better knowledge of the processes in the soil and the effective stress situation, as well as the development of recommendations for a sustainable, site-appropriate soil management and for the protection of the soil are important.

The area *"Promotion and use of biodiversity and habitats in the agricultural landscape"* shows how ecologically valuable habitats can be preserved and used for agriculture. For this purpose, Agroscope conducts monitoring for the federal government and evaluates the measures that have been introduced for the conservation of biodiversity. The evaluation makes it clear where to start in order to improve the effect of ecological compensation measures.

According to the federal government's climate strategy, greenhouse gas emissions in agriculture are to be reduced by at least one third by 2050. In the area of *"Agriculture and Climate Change",* analyses provide important bases for policy makers and practitioners to decide which measures should be pursued to achieve the targets.

Impact of the expenditure

The following examples show the impact in the four eligible areas. As this primarily concerns basic research, it is not possible to show quantitative impact measures.

Life cycle analyses with impact assessments regarding all relevant environmental impacts

A newly developed indicator of competition between food and feed production on arable land has shown that purely plant-based foods could contribute more to protein and energy supply for humans. A major leverage in the food system is therefore on the consumption side. By reducing animal foods in the diet, especially meat, and avoiding food waste, environmental impacts could be greatly reduced; with an environmentally optimized diet, they would be less than 50 % of current levels.[4]

Expansion of soil monitoring

The National Soil Monitoring Office (NABO) records and assesses soil contamination throughout Switzerland and enables the early detection of threats to soil fertility. With regard to the contamination of the soil with foreign substances, the focus is now also on plant protection products (PPPs). NABO therefore established a national survey on PPP residues in agricultural soils as a basis for future monitoring, which aims at early detection and prevention of negative impacts of PPPs on soil biodiversity and soil functions.

Biodiversity benefits quantified

Pollinating insects play an essential role in providing pollination services to agricultural crops and wild plants. The economic value of the pollination services provided mainly by honeybees and wild bees pollination services for Swiss agriculture was estimated for the first time. It amounts to about 340 million Swiss francs annually.[5]

Basics for the reduction of greenhouse gas emissions

The inventory of greenhouse gas (GHG) emissions from agriculture shows that in Switzerland, animal husbandry is responsible for about 85 % of agricultural GHG emissions. Technical measures to reduce GHG emissions in production tend to have a low impact and/or they cause trade-offs with other environmental impacts. A large reduction potential would be the change of food consumption to an increased plant-based diet, accompanied by a transformation of agricultural structures.[6]

Dissemination of new knowledge

The following graph shows the number of contributions and publications for practice and science made possible by the 13 million Swiss francs in the four areas.

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[6] Switzerland's National Inventory Document 2023 (GHG inventory 1990–2021):
https://www.bafu.admin.ch/bafu/en/home/topics/climate/state/data/climate-reporting/ghg-inventories/latest.html
[2] Bretscher D., Ammann C., Wüst C., Nyfeler-Brunner A., Felder D.
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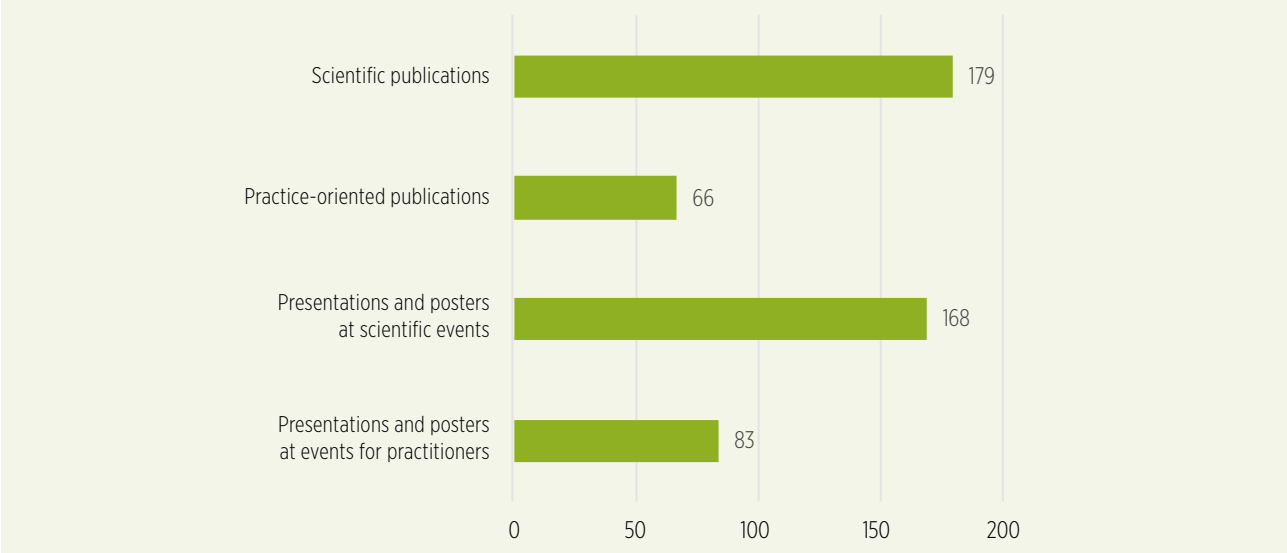
Sustainable agriculture and food industry in 2021



Source: internal, Agroscope

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