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Swiss Confederation

Der Bundesrat

Bern, 26.10.2022

The Swiss National Bank and Switzerland's sustainability goals

Federal Council report

in response to postulate 20.3012 from the National Council Economic Affairs and Taxation Committee 24.02.2020

Contents

Executive summary

The Swiss National Bank (SNB) takes account of various climate, environmental and sustainability aspects, to the extent that they affect price and financial stability or entail financial risks for the SNB. However, the SNB is not responsible for promoting structural change towards a climate-friendly economy. In fulfilling its mandate – a stability-oriented monetary policy – the Swiss National Bank helps ensure that the government and Parliament can implement the country's sustainability goals. The Federal Council rejects an extension of the SNB's mandate for public policy reasons.

The postulate "Nachhaltigkeitsziele für die Schweizerische Nationalbank" (20.3012) (Sustainability goals for the Swiss National Bank) requests the Federal Council to demonstrate how the Swiss National Bank (SNB) can support the Confederation in achieving its sustainability goals. This report focuses on climate sustainability.

Climate change poses major challenges to governments, central banks, and regulatory and supervisory authorities. However, it is the government and Parliament that are primarily responsible for setting specific sustainability goals, especially climate goals, and deciding which instruments to use in order to achieve them, such as a CO^2 tax.

The central banks in the industrialised world vary in terms of the attention given to climate considerations. Those central banks that actively include climate policy goals in their operations, such as the European Central Bank (ECB) or Bank of England, normally have mandates instructing them to support general economic policy as a subsidiary goal in addition to their primary aim of price stability.

The SNB's legal duty, its mandate, is "to ensure price stability, while taking due account of economic developments". Central bank independence is key to conducting a successful, stability-oriented monetary policy. The SNB has been granted a high degree of independence. To balance that, the legislator has deliberately issued it a narrow and clearly defined mandate. The SNB may not extend its mandate autonomously, nor use its instruments to pursue other aims – e.g. sustainability or climate goals.

The Federal Council views the clear division of tasks and responsibilities between the SNB, Federal Council and Parliament as proper and necessary from a public policy standpoint. Expanding the SNB's mandate would inevitably lead to conflict with the goal of price stability and politicise monetary policy. In addition, the SNB would need new instruments with which to pursue its extended mandate. The SNB's current monetary policy instruments are designed to ensure price stability, as opposed to pursuing climate goals.

Nonetheless, the consequences of climate change and climate policy do impact the SNB in the performance of this mandate – to ensure price stability (monetary policy) – as well as its affiliated tasks of contributing to financial stability and asset management. In fulfilling its mandate, the SNB must take account of climate, environmental and other sustainability aspects, to the extent that they affect price and financial stability or entail financial risks for the SNB. Accordingly, the SNB addresses climate change and its consequences in its monetary policy analysis (see chapter 6), in its duty with regard to financial stability (see chapter 7) and in its asset management (see chapter 8). The SNB does provide indirect support to Switzerland's sustainability goals through its operations by, for example, contributing to research into climate-relevant issues, participating in international knowledge exchange and cooperating in establishing regulatory frameworks for risk disclosure.

1 Background

The postulate "Nachhaltigkeitsziele für die Schweizerische Nationalbank" (20.3012) (Sustainability goals for the Swiss National Bank) requests the Federal Council to issue a report and demonstrate how the Swiss National Bank (SNB) can support the Confederation in achieving its sustainability goals and which proactive role it can assume in coordinating climate measures in the financial sector. The motion is included in the annex. It was submitted by the National Council Economic Affairs and Taxation Committee (EATC-N) and passed by the National Council on 30 October 2020 with 100 votes in favour, 83 against and one abstention.

The Federal Council has recommended the postulate for acceptance. It acknowledges that there is broad interest in sustainability in connection with the SNB and that there have been many motions on the issue in the past.[1]

This postulate report addresses and analyses contemporary discussions on the role of the SNB in sustainability. The mandate of the Swiss National Bank to ensure price stability while taking due account of economic developments is not called into question.[2]

Background to the postulate and public debate

The postulate was prompted by The Green Swan[3] report issued by the Bank for International Settlements (BIS). This report demonstrates that climate change entails major risks for the financial sector and financial stability, and calls for a greater focus on these risks based on a coordinated international approach. The EATC-N stated the following as the rationale underlying the postulate:[4] "the advance of global warming will grow as a cause of financial and price instability in the future. The risk assessment and mitigation thereof is thus integral to the Swiss National Bank's mandate". The Federal Council report will show "how the SNB can ensure performance of this task while maintaining its independence."**Fehler! Textmarke nicht definiert.**

The EATC-N observed that the SNB fails to take adequate account of climate risks in performing its tasks and, in addition, does not consider the effects of its operations on the climate in its decision-making processes – especially with regard to its investments. Regarding the former point relating to the risk perspective (see Box 1), the postulate states that climate risks are not adequately priced into the market. Therefore, the SNB must, among other things, deviate from its market neutrality in managing its currency reserves and select assets that take "proper" account of climate risks. The latter point relating to the impact (see Box 1) goes further. The proponents of this argument contend that the SNB must not only take adequate account of climate and other environmental risks in the context of its monetary policy and risk management, but that it can and must actively contribute to mitigating those risks and support the economy's shift towards greater sustainability. The SNB has also been repeatedly criticised for allegedly acting against Switzerland's climate goals by, for example, holding shares in companies that are expanding their fossil fuel production. The SNB is basically being called upon to provide targeted cooperation in the implementation of Switzerland's climate and environmental policy and the fulfilment of its sustainability goals.

[1] Interpellation Widmer Céline (21.4601): Switzerland as a leading sustainable financial centre – without the SNB and FINMA?, Interpellation Masshardt (21.4483): Biodiversity and financial stability – Report by the Network for Greening the Financial System, Interpellation Clivaz Christophe (21.4317): Protecting the Swiss financial centre from biodiversity-based financial risks, Interpellation Widmer (21.3336): Application of the new NGFS recommendations, Interpellation Badran (21.3279): The SNB's duty of due diligence and market neutrality, Interpellation Landolt (21.3099): Sustainability goals for the SNB, Question Widmer Céline (21.1091): Consider sustainability competencies for election to the SNB Governing Board, Question Klopfenstein Broggini (21.1084): the SNB can contribute to financing the energy transition, Question Klopfenstein Broggini (21.1083): The SNB can disclose its investments in fossil fuel companies, Interpellation Badran (20.4305): SNB environment-related investment policies, Interpellation Badran (20.4299): Market neutrality, Interpellation Fischer (20.3704): Paris Agreement, Motion Hurni (20.3619): SNB investment decisions, Interpellation Hurni (20.3114): SNB investments, Interpellation Andrey (22.3678) Sustainable monetary policy.
[2] On acceptance of the postulate by the National Council, Federal Councillor Maurer specified: "The SNB's core mandate cannot be complicated by additional requirements or additional ideological issues. We must be clear about that. The SNB's core mandate is something else." Federal Councillor Maurer, Ueli (2020).
[3] Bolton, Patrick et al. (2020)
[4] Ryser, Franziska (2020)

On the other hand, there are also opposing voices in the political and public domains that expressly oppose expanding the SNB's mandate. They view an independent SNB that focuses on ensuring price stability as indispensable to an efficient economy and society. Price stability is seen as a prerequisite for planning security, which is key to achieving sustainability goals. The transfer of extraneous issues to the SNB would place monetary policy under political influence. This would jeopardise independence and thus ultimately the ensuring of price stability. Following climate goals, other political issues (e.g. biodiversity, questions of distribution) could also be assigned to the SNB as policy goals. The proponents of the status quo also point out that the SNB's monetary policy instruments are not suited to achieving these kinds of aims, and that conflicting objectives would be inevitable.

Box 1

Risk perspective versus impact perspective

The **risk perspective** focuses on the financial risks that climate change and its associated adaptation processes (e.g. climate policy) pose for companies (in this context: central banks) and their operations and performance, and what economic and financial impacts (climate risks) could result. The expert literature refers to "financial materiality" or "financial substantiality". A climate risk for central banks would arise, for example, if extreme weather events were to become so frequent that they impact overall potential output, leading to higher general price volatility.

The **impact perspective** involves the effects of a company's (in this context: central banks') operations on the climate (greenhouse gas emissions, for example). For financial market participants, the effects on the climate of those companies' operations in which they have holdings (e.g. in the form of shares or bonds) are also taken into account. The terms "climate materiality" or "climate relevance" are used in expert circles.

The difference between the risk and impact perspectives is not always black and white. For example, a risk assessment could lead to the exclusion of major greenhouse gas emitters from an investment portfolio. If a major shareholder applies this exclusion, this could send a signal to other investors, resulting in a positive effect for the climate. The company in question would then be forced to develop a transition strategy to regain its appeal to investors. However, the reduction of financial climate risks by the parties involved does not automatically have an effect on the climate (see Federal Council report in response to postulate 19.3966).[5]

The legal mandate sets the SNB's scope for action

The fundamental mission – also known as a mandate – assigned by the legislator defines what a central bank must do, may do and may not do. The definition of the SNB's mandate is thus a key part of this report: the description of the current mandate – including its limits – sets the boundaries within which the goals and tasks are set for the SNB (see chapter 5). The report also addresses the question of how the SNB can contribute as a company to Switzerland's sustainability goals.

The National Bank is independent with regard to fulfilling its mandate

The central bank in Switzerland is independent, as in many other countries. That means the SNB may not accept any instructions from the Federal Council, Federal Assembly or other bodies.

In its monetary policy report of 21 December 2016, the Federal Council listed two conditions that must be met to democratically legitimise the independence of the central bank.[6] Firstly, the scope for action and margin for discretion must be limited by a clear mandate. Secondly, the central bank must fully account for its actions and goal achievement so that its operations are transparent and understandable to third parties.

[5] Federal Council (2019a)
[6] Federal Council (2016): 15

What does sustainability mean?

There are different views on that. The most broadly accepted and applied definition of sustainability is given in Agenda 30 for Sustainable Development and its Sustainable Development Goals (see chapter 2). In the financial sector, sustainability has to date often been taken to mean that financial market participants consider environmental, social and responsible governance aspects in their actions.[7] These aspects are often referred to as ESG criteria. The abbreviation ESG stands for environment, social and governance. There is currently no international, uniform and binding ESG standard. Market players observe a variety of disparate standards. The sustainability focus for central banks is mainly on financial climate risks. Other financial environmental risks, arising for example from decreasing biodiversity, have also recently appeared on their agenda. This report is mainly about climate issues. This is because the postulate is based on the climate debate. In addition, the effects of climate change and its associated risks have been researched for some time, while the effects of decreasing biodiversity, for example, are less well known. In some parts of the report the statements are, where necessary and material, expanded to include other aspects of sustainability.

Structure of the report

The report is structured as follows: chapter 2 outlines the sustainability goals targeted by Switzerland. The risks associated with climate change are set out in chapter 3, which focuses mainly on whether climate change and its consequences are also fundamental to central banks. Chapter 4 gives a brief overview of the mandates of different central banks and their varying assessments and activities with regard to climate risks. The chapters following that are about the Swiss National Bank. Chapter 5 breaks down the SNB's mandate and its resulting tasks. The report then addresses how the SNB factors in climate risks in ensuring price stability (chapter 6), contributing to financial stability (chapter 7) and in its asset management (chapter 8), and whether it could take additional measures to achieve Switzerland's climate goals. Chapter 9 is about the SNB's own sustainability footprint and how it could further reduce it. The report's conclusion is presented in chapter 10.

[7] Federal Council (2020): 7

2 Switzerland's sustainability goals

Sustainability and the promotion thereof by the Confederation is a constitutional requirement. Sustainability is enshrined more than once in the Federal Constitution of the Swiss Confederation of 1999.[8] Article 2 emphasises that the Swiss Confederation shall promote sustainable development. Under Article 73, the Confederation and cantons must strive for "a balanced and sustainable relationship between nature and its capacity to renew itself and the demands placed on it by the population".

2030 Agenda for Sustainable Development

The member states of the United Nations (UN), including Switzerland, committed to achieving the 17 Sustainable Development Goals (SDGs) together by 2030 when they approved the 2030 Agenda for Sustainable Development in 2015. The SDGs include various objectives related to climate change, ecosystems and biodiversity. Agenda 2030 defines the global reference framework for sustainability until 2030.

Switzerland is committed to the implementation of these global Sustainable Development Goals at both national and international level. The Federal Council shows how it will focus on implementing Agenda 2030 for sustainability in the next ten years in its 2030 Sustainable Development Strategy (2030 SDS).[9] 2030 SDS and the associated 2021-2023 Action Plan were adopted by the Federal Council on 23 June 2021. The strategy contains three priority topics. (1) "sustainable consumption and production", i.e. the assurance of competitive operating conditions for an innovative, forward-looking economy. (2) "climate, energy and biodiversity" includes both the reduction of all greenhouse gas emissions and the proper handling of climate-induced risks. (3) "equal opportunities and social cohesion" means ensuring an inclusive, non-discriminatory society that builds on the diversity of cultures, languages, religions and ways of life in Switzerland.

Paris Agreement and the Confederation's climate strategy

Switzerland ratified the Paris Convention on Climate Change in 2017.[10] This agreement obliges the community of nations to keep the rise in average global temperature well below 2°C compared to pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5 °C, foster climate resilience and make finance flows consistent with a pathway towards low greenhouse gas emissions.[11] The Federal Council announced in 2019 that it was aiming for the goal of net-zero emissions by 2050 (see Box 2).[12]

Box 2

Why net-zero emissions?

The Intergovernmental Panel on Climate Change (IPCC) showed in a report published in 2018 that a global warming level of 1.5°C must be expected to trigger major changes in ecosystems. Research indicates that net greenhouse gas emissions must be lowered to zero by no later than 2050 in order to limit global warming to 1.5°C. Net-zero means not releasing more greenhouse gases than can be absorbed by natural and technical means.

On 27 January 2021, the Federal Council approved Switzerland's long-term climate strategy.[13] The strategy demonstrates how the target of net-zero can be achieved by 2050. It presents possible climate goals and emission pathways for the construction, industry, transport, international aviation, agriculture and food, waste, synthetic gases and financial market sectors. The main emphasis is on

[8] SR 101
[9] Federal Council (2021b)
[10] SR **0.814.012**
[11] Art. 2 para. 1 let. c of the Paris Agreement (SR 0.814.012)
[12] Federal Council (2019b)
[13] Federal Council (2021a)

the comprehensive reduction at a national level of emissions from construction, transport and industry by 2050. Most of the unavoidable or almost unavoidable emissions are in agriculture and some industrial processes, for example cement production. These remaining emissions must be offset by natural and technical sinks (negative emission technologies).

Sustainable financial market policy

The theme of sustainability has been anchored in Switzerland's financial market policy for a number of years. In the summer of 2020, the Federal Council submitted an overview and position statement in the report Sustainability in Switzerland's Financial Sector.[14] The conclusion of the report is that sustainability is gaining in importance in finance at both national and international level. It sees this as a major opportunity for the Swiss financial centre. The state must assume the role of intermediary, conduct intensive dialogue with the sector and stakeholders and commit to an optimal regulatory framework. An initial step towards transparency occurred in the summer of 2021. The Federal Council set parameters for binding climate reporting for large Swiss companies.[15] The parameters are based on the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD, see BoxBox 3). These companies must disclose their climate risks and show how their operations impact the climate. In the first half of 2022, the Federal Council submitted an ordinance on climate reporting by large companies for consultation. The ordinance specifies new provisions under company law governing reporting on non-financial matters.[16] These provisions could also be relevant for the SNB's reporting (see chapter 8.4). In November 2021, the Federal Council recommended that financial market players use comparable and meaningful climate compatibility indicators to help create transparency in all financial products and client portfolios. [17]

Box 3

Task Force on Climate-related Financial Disclosures (TCFD)

The TCFD was founded by the Financial Stability Board (FSB) at the end of 2015 and is managed by representatives of the private sector. In 2017, it published recommendations on the disclosure of climate-related risks and opportunities. These are aimed at helping investors, insurers and lenders to measure climate-specific risks and opportunities for a company with greater accuracy.

The recommendations form a common international framework allowing companies and financial sector participants to present their exposure to climate risks correctly and consistently, and explain their strategy and risk management with regard to climate risks and opportunities. The recommendations correspondingly relate to the four areas of governance, strategy, risk management, and metrics and targets (i.e. quantitative measures and target variables).

According to the September 2022 status report, the TCFD is supported by more than 3,500 signatory organisations worldwide, from both the public sector – including governments – and the private sector.

[14] Federal Council (2020)
[15] Federal Council (2021d)
[16] Federal Council (2022)
[17] Federal Council (2021e)

3 Climate change and climate risks

The Intergovernmental Panel on Climate Change (IPCC) stated in its report in 2021[18] that the global surface temperature was 1.09 °C higher on average from 2011 to 2020 than from 1850 to 1900 (pre-industrial period). This temperature rise is due to human activity. It causes the melting of glaciers and the Arctic ice cap, temperature increases in the upper ocean layers and rising sea levels. The speed of climate change is a lot higher than in the past.

The global surface temperature will rise further by 2050 according to all IPCC projections. This will accentuate climate change further: it is forecast that the strength and frequency of extreme events, such as torrid heat, drought and heavy rainfall will continue to grow. Many of these changes in the climate are seen as irreversible. This makes countermeasures to climate change highly urgent. The latest IPCC report gives a timeframe to the urgency.[19]

3.1 Climate change, climate risks and central banks

Climate change is caused by greenhouse gas emissions resulting from human use of fossil fuels (oil, coal etc.) or through land conversion (deforestation), which accumulate in the atmosphere. The consequences of the emissions are borne not only by the emitters themselves but by everybody, future generations and the environment. This is known in economics as external costs.

The scientific community broadly agrees that the underlying problem of climate change – the omitted costs of individual behaviour – can be mitigated most efficiently by raising the price of greenhouse gas emissions, notably through a higher CO_2 price.[20] This could be achieved through a tax, emissions charge or indirectly via an emissions trading system. The tax or levy would make behaviour detrimental to the climate more expensive, thus providing incentives to suppliers and consumers to convert to more climate-friendly alternatives.

This sounds simple in theory, however there are also other complicating factors to consider. First of all climate change is a global phenomenon. This means that an internationally coordinated approach is needed to enhance effectiveness. Secondly, the consequences of climate change impact both current and future generations. The planning horizon of today's economic actors (companies and households), financial market players, central banks and politicians is normally a lot shorter than the planning horizon required to combat climate change effectively and take account of future generations' needs.[21] The national and global distribution problems arising from these factors plus a raft of additional, practical problems pose major challenges to governments all over the world.

The consequences of climate change for the economy and financial system: climate risks

Climate change-related factors that could impact the economy and financial system are referred to as "climate risks". There are two basic types of climate risk.[22]

- The first one is **physical risks** caused directly by climate change. They can be long term (chronic) or event-related (acute). Acute physical risks include extreme weather events and their consequences, such as floods, heavy rain, storms, hail, avalanches, heat and droughts or forest fires. Chronic physical risks include longer-term changes in climatic and environmental

[18] IPCC (2021)
[19] IPCC (2022)
[20] William Nordhaus put it as follows: "*Economics points to one inconvenient truth about climate-change policy: For any policy to be effective, it must raise the market price of CO_2 and other GHG emissions. Putting a price on emissions corrects for the underpricing of the externality in the marketplace. Prices can be raised by putting a regulatory limit on the amount of allowable emissions and allowing trading ("cap-and-trade"), or by levying a tax on carbon emissions (a "carbon tax")",* see Nordhaus, William (2018): 453
[21] With reference to the tragedy of the commons, the former governor of the Bank of England, Mark Carney, coined the term "*tragedy of the horizon",* see Carney, Mark (2015): 3
[22] NGFS (2019): 12, Baur, Martin et al. (2021)

conditions and their consequences, for example the increase in average surface temperature, the increase in the ocean temperature and rising sea levels. Physical risks can cause direct damage, e.g. to production facilities, business premises, or also entail indirect financial consequences, such as disrupted supply chains.

- The second type is **transition risks** associated with the transition to a low-emission economy. These risks arise from changing prices and asset values due to climate policy or technical innovation or because of changing consumer preferences. Climate policy includes government regulations, such as banning oil heating, regulations on energy efficiency and heating systems for new builds, CO_2 taxes, subsidies for promoting innovation in the area of green technologies etc.

Climate change and climate policy – where do the central banks come in?

The consequences of climate change and climate policy can impact central banks in a number of ways: the maintenance of price stability (monetary policy), financial stability and asset management. [23] As regards monetary policy, climate change and climate policy can influence important economic variables such as prices, interest rates, production and employment. Economic analysis can also be complicated by climate change. Financial stability can be impaired by financial risks arising from climate change and the countermeasures employed that impact not only individual banks but also the entire financial system. Physical risks and transition risks can lead to abrupt changes in asset values. These changes can also affect central bank investments. That is why central banks must take adequate account of climate-related financial risks in the risk management of their investments (mainly securities portfolios held for monetary policy reasons).

All central banks are in agreement that the effects of climate change and its associated measures must be taken into account from a risk perspective.[24] However, there are different opinions regarding the impact of climate risks on the economy and their importance for central banks' monetary policy implementation. There is heated debate about the extent to which climate risks are already factored into the market prices of assets, ratings and the like, and if not, whether and how central banks should take them into consideration. The discussion centres mainly on how climate risks could complicate the monetary policy implementation by making it harder to judge the economic situation and also by jeopardising financial stability. Some central banks consider it part of their remit to provide support beyond the scope of risk assessment by facilitating the transition to a lower-emission economy (see chapter 4).

Ultimately, however, the legal framework determines the scope for action available to each central bank regarding climate change as well as other political areas (e.g. unemployment, biodiversity, combating poverty etc.).

3.2 Quantifying climate risks

Quantifying the effects of climate change and its associated economic and financial risks is a challenging task: new modelling methods are needed,[25] which can classify these developments qualitatively and quantitatively. These methods face major uncertainty with regard to future developments and a lack of historical empirical values.[26] Climatic systems are highly complex, interrelated, sometimes characterised by irreversible tipping points and subject to major regional differences. All these factors make the modelling and quantification of climate risks a difficult task.

[23] Weidmann, Jens (2020): 4 et seq.; SNB (2021a): 51 is also similar
[24] NGFS (2019): 4
[25] For example macroeconomic climate models combining model elements from economic sciences and climate research, see Deutsche Bundesbank (2022): 35 et seq.
[26] NGFS (2019): 27

Assumptions regarding future national and international climate policy are a major source of uncertainty in model calculations.[27] Governments can set the framework conditions for transitioning to a low-emission economy through their climate policy. The extent of adaptation by companies and households is another source of uncertainty. Companies can simplify, help shape and ultimately benefit from the transition through innovation. Ultimately, households can also nurture the change through their consumption behaviour. That is why there are often climate risk quantification scenarios involving different assumptions regarding climate policy, innovation and consumption behaviour, thus leading to different economic developments. As climate change is global, this analysis must be repeated for many countries.

Network for Greening the Financial System NGFS

Against this background, central banks and supervisory authorities have joined together through the "Central Banks and Supervisors Network for Greening the Financial System (NGFS)". The SNB and FINMA have been members since April 2019 and contribute actively to its work. The network currently has 116 members and 19 observing institutions. The latter include the BIS and Basel Committee on Banking Supervision. The network serves the participating institutions as a forum for exchange on climate change risks facing the economy and financial system.[28]

A central goal of the NGFS members is to better understand the consequences of climate change for monetary policy and financial stability. To that end, the NGFS engages in research, especially in the area of model-related evaluation of the economic and financial effects of climate change and the associated adjustment behaviour. The NGFS also outlines options for action by central banks and financial market supervisory authorities as regards dealing with climate risks and mobilising capital for green and low-emission investments in the context of ecologically sustainable investment.[29] The NGFS wants to use these guidelines to encourage members and non-members to adopt proven practices as far as possible within the scope of their legal mandate.[30]

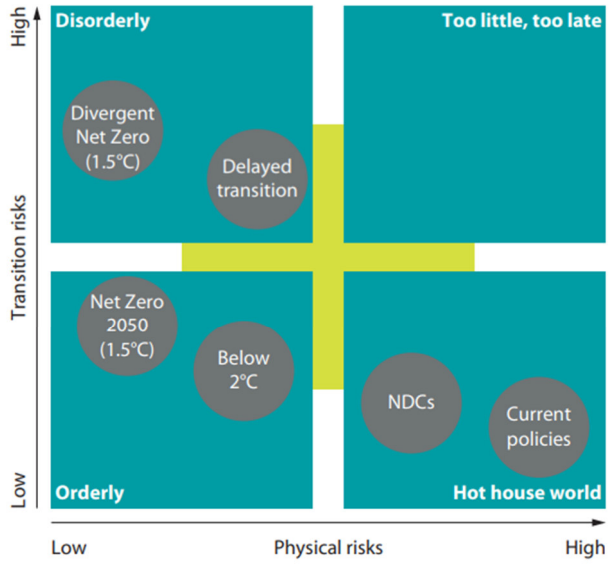
The network currently consists of four working groups:[31] 1. Supervision, 2. Scenario Design and Analysis, 3. Monetary Policy and 4. Net Zero for Central Banks. The SNB is involved in working groups 2, 3 and 4. The Scenario Design & Analysis and Monetary Policy working groups deal mainly with the effects of climate change on monetary policy. The Scenario Design & Analysis working group creates scenarios on climate change and its impacts for direct application in economic and financial-economic models. The scenarios – as a common starting point for analysis – provide international consistency and comparability of analyses. The NGFS last updated its scenarios in June 2021.[32]

There are four basic categories. Scenarios have been drawn up for three of these (see Figure Figure **1**). The assumption in the "Orderly" category is that governments act quickly to take measures to transition to a carbon-neutral economy and that these measures are enhanced consistently. Physical and transitional risks remain relatively low. The second category, "Disorderly", comprises two scenarios in which governments act late or adopt diverging measures across countries and sectors. As they are either late or diverse, the climate policy measures must be strong (high transition risks), in order to keep the physical risks low. The third category, "Hot house world", assumes that only some countries adopt climate policy measures and global efforts are insufficient to prevent significant global warming. This results in high physical risks and irreversible dynamics. By contrast, the transition risks are low as there is no transition to a carbon-neutral economy. The fourth category, "Too little, too late", is the worst one, as governments not only act late (see Disorderly) but too late. There are no scenarios for this category.

[27] Hawkins, Ed and Sutton, Rowan (2009): 1096 et seq., as well as Hsiang, Solomon and Kopp, Richard (2018): 25 et seq.
[28] SNB (2022b): 125
[29] https://www.ngfs.net/en/about-us/governance/origin-and-purpose
[30] NGFS (2019): 4
[31] https://www.ngfs.net/en/about-us/governance/general-information
[32] The publication covers six scenarios with almost 1,000 economic, financial and climate risk-related variables. The scenarios are based on different assumptions regarding political and technological developments. See NGFS (2022) for the scenarios.

The first three categories are allocated to six specific climate change scenarios. They differ in terms of the global temperature goal and how quickly or in which way the transition proceeds to a globally lower CO_2-emitting economy. Scientific models are used to analyse how CO_2 prices have to develop for greenhouse gas emissions to come down far enough to reach a given target temperature. For example, the net-zero 2050 (1.5°C) scenario assumes that a gradual global increase in CO_2 tax allows the rise in temperature to be limited to 1.5°C. Limiting the temperature increase to 1.5°C means that the physical risks are lower than in other simulated scenarios. The combinations of transition and physical risks influence the overall effect of the six scenarios on the economy and inflation. The range but also the uncertainty regarding the effects of climate change are very large.[33]

Figure 1: NGFS scenarios



Positioning of scenarios is approximate, based on an assessment of physical and transition risks out to 2100.

Source: NGFS 2021 Climate Scenarios for central banks and supervisors, p. 7

Improving the data basis is key to evaluating financial climate risks

The individual NGFS working groups address the challenges inherent in quantifying and assessing climate risks. On the one hand, data accessibility and the level of detail must be improved. That is contingent, among other things, on the disclosure of climate-relevant risks and opportunities by companies, which requires an internationally recognised and broad-based disclosure standard. Disclosure of climate-relevant risks and opportunities is also indispensable for investors wishing to invest sustainably or to better evaluate corresponding risks. The NGFS continuously refines its scenarios and attempts to close gaps in modelling. Through its involvement in the NGFS and the working groups, the SNB takes part in the exchange of knowledge, enabling it to better understand and anticipate the potential consequences of climate risks on macroeconomic developments (chapter 6) and financial stability (chapter 7).

[33] Simulations going up to 2100 are available for different countries and regions. For Switzerland, there is data on the forecast CO_2 price, energy mix and energy emission for each climate change scenario. There are ongoing efforts to improve and refine these simulations. There is, inter alia, work underway to improve data quality and the interlinking of transition and physical risks, see NGFS (2022): 45.

4 International developments

4.1 General information on structuring mandates

The legal mandate for the vast majority of central banks in the industrialised world stipulates price stability as the primary monetary policy aim. In some countries the mandate contains other equally important goals; in the US, for example, maximum employment and moderate long-term interest rates also have top priority, while in the UK, Japan and other countries it is financial stability. Financial stability has gained in importance for many central banks over the years; due in no small measure to the global financial crisis in 2008, which sent major financial shockwaves through the real economy and price levels. In most countries, central banks are solely responsible for price stability but not for financial stability, where they share the workload with other authorities. The central bank is normally responsible for the functioning of the entire financial system (macroprudential regulation), while an independent supervisory authority normally assumes responsibility for monitoring individual banks and financial market participants (microprudential regulation). This is the case in Switzerland with the SNB and FINMA (see chapter 5.2). The jurisdiction of some central banks is broader, spanning macroprudential regulation and microprudential banking supervision, the most prominent example being the ECB.

One fundamental differentiating feature of central bank mandates is whether the primary objective (or objectives) also includes explicitly supporting general economic policy as a monetary policy goal. Various central bank mandates contain a subsidiary (secondary) goal of supporting the government's general economic policy as and/or to contributing to a prosperous economy or some similar formulation (dual mandate). In order to pre-empt potentially conflicting interests, the secondary goal is subject to the caveat that it may not be achieved at the expense of the primary goal of price stability. The ECB and Bank of England, for example, have a dual mandate. On the other hand, the mandates of the Federal Reserve (Fed) in the US, the Bank of Canada, Sveriges Riksbank, Bank of Japan and People's Bank of China, like the SNB mandate (see chapter 5.1), do not have a secondary objective of supporting general economic policy (single mandate). The rationale behind the single mandate is that the central bank is in the best position to contribute to economic growth when it can focus on fulfilling its primary monetary policy aim (or aims).

It is beyond dispute that central banks have to take account of climate risks as part of their mandates to the extent that such risks affect price and financial stability. This includes in particular analysing and forecasting the effects of climate change on inflation and economic development as well as the impact of climate risks on financial stability. Every central bank must fulfil these tasks regardless of whether it has a broad or narrow mandate. However, the extent to which consideration of climate risks justifies central banks, under their mandates, assuming an active role in sustainability policy, for example by aligning bond purchasing programmes with sustainability criteria or through actively promoting the conversion to a more sustainable economy, is the subject of controversial debate among central banks and experts. Generally speaking, dual mandates that explicitly assign the central bank a supporting role in general economic policy seem to offer more scope for an active sustainability policy than more narrowly defined mandates, such as that of the SNB. However, it ultimately depends to a large extent on the national and supranational (for example ECB) interpretation of the mandates, including the dual ones.

Besides the different mandate types, the central banks also have different views on how far they can go in correcting any market price distortions (see Box 4). The implementation of monetary policy is also different as the monetary policy strategies and instruments are tailored to the demands of the specific economic area covered by the central bank. Monetary policy requirements differ fundamentally between major domestically focused economies such as the US and small open economies like Switzerland or Norway, where the exchange rate is extremely important.

Box 4

Climate risks: should central banks correct market failure?

The non-internalised costs of greenhouse gas emissions lead to market failure and thus a misallocation of resources. By internalising costs – in this specific case by taxing greenhouse gas emissions – this market failure could be efficiently corrected. As explained in chapter 3.1, such an approach can be hard to implement for a number of reasons.

Some central banks are therefore discussing whether they could correct this misallocation of resources by deviating from their fundamentally market-neutral approach. That would involve applying their monetary and investment policy measures to promote green activities and sectors over their climate-damaging counterparts.

Deviating from the fundamentally market-neutral approach with the aim of rectifying a market shortcoming, however, raises some fundamental questions: for a start, such a move by the central bank could cause new distortions and facilitate price bubbles. After all, central banks do not necessarily have more information on where the market has gone wrong than other market participants. Moreover, a conflict of interest with the monetary policy mandate could emerge. There is also the question of whether central banks have the authority to enact structural policy measures. Such structural policy measures could expose the central bank to allegations of exercising political influence.

4.2 Mandates and activities of selected central banks

ECB

The mandate conferred on the ECB in the Treaty on the Functioning of the European Union[34] (Art. 127) is dual in nature. The primary goal is to ensure price stability. All other ECB goals are subordinate to this objective. As a subordinate goal, the mandate stipulates supporting the general economic policy in the European Union to contribute to the fulfilment of its aims,[35] which include "the sustainable development of Europe based on balanced economic growth and price stability", a "highly competitive social market economy" and "a high level of protection and improvement of the quality of the environment".

ECB President Lagarde and other Executive Board members have stated more than once that the ECB's assumption of an active role in climate policy is compatible and even required under the current mandate.[36] Firstly to fulfil its primary goal of price stability, as climate change and the countermeasures employed can lead to price increases, which monetary policy should causally counteract. The other reason is the subordinate aim of supporting EU economic policy. This broad interpretation of the mandate by the ECB Executive Board is, however, disputed in expert circles and criticised in some quarters as politically overreaching the mandate.[37]

On publication of its new monetary policy strategy on 8 July 2021, the ECB announced the incorporation of climate protection factors into its monetary policy[38] with reference to the "detailed roadmap of climate change-related actions".[39] It plans to expand its analytical capabilities in the areas of macroeconomic models, statistics and monetary policy with regard to climate change. The ECB also plans to incorporate the EU Regulation currently being prepared (Corporate Sustainability Reporting Directive, CSRD) into its admittance criteria for eligible underlying assets and the purchase of

[34] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12012E/TXT:en:PDF
[35] Goals as per Article 3 of the Treaty on European Union, see https://eur-lex.europa.eu/resource.html?uri=cellar:2bf140bf-a3f8-4ab2-b506-fd71826e6da6.0020.02/DOC_1&format=PDF
[36] E.g. Lagarde, Christine (2021) or Elderson, Frank (2021) and Schnabel, Isabel (2021)
[37] E.g. Issing, Otmar (2021) or Fuest, Clemens et al. (2021)
[38] ECB (2021): Annex
[39] ECB (2021)

securities. It is preparing climate stress tests for its own balance sheet as well as supervisory climate stress tests for individual banks. The ECB plans to incorporate climate-relevant criteria into its corporate sector purchase programme (CSPP) by changing the benchmark. Furthermore, corrective measures are to be introduced in the area of risk evaluation, should it be discovered that climate-relevant risks are not adequately priced in by the market.

In July 2022, the ECB specified how it planned to involve climate aspects more in its monetary policy transactions. One measure is to pursue the incremental decarbonisation of ECB corporate bond holdings (scheduled from October 2022) by reinvesting redeemed bonds in corporate bonds with a better climate performance as measured by lower greenhouse emissions, more ambitious CO_2 reduction targets and improved climate-related disclosure. The ECB stresses that its measures are fully aligned with the overriding monetary policy goal of ensuring price stability. The measures are to better reflect climate-related financial risks in the ECB balance sheet and also – with regard to the subordinate goal of supporting EU economic policy – to support the green conversion of the economy in line with the EU climate-neutrality goals.[40]

Czech National Bank

The Czech National Bank mandate names ensuring price stability as its primary goal. In addition, it must guarantee financial stability and a secure financial system. The Czech National Bank must support the government's economic policy of sustainable economic development and the economic policy of the European Union[41] without compromising its primary goal.

Although the Czech National Bank, like the ECB, must support the European Union's economic policy and, in addition, explicitly support the policy of sustainable economic growth at national level, it has a narrower mandate than the ECB, centred more on guaranteeing price stability and financial stability. The Czech National Bank did broach the subject of climate risks in its 2019/2020 annual financial stability report, but does not see itself as the right institution to pursue sustainability goals. The Czech National Bank is not responsible for rectifying the market's failure to price greenhouse gas emissions properly. It fears that, were to interpret its mandate more broadly, it would have to give up what are, in the Bank's view, central principles such as market neutrality, would become politicised thus placing its independence in jeopardy, would be less effective in pursuing its primary aim.[42] The Czech National Bank has not yet joined the NGFS.[43]

Bank of England

The mandate of the Bank of England has the primary goal of ensuring price and financial stability and, subordinate to that, supporting the government's economic policy. In March 2021, the Chancellor of the Exchequer explicitly added sustainability to the latter objective for the first time ("supporting the transition to a net zero emissions economy") during the annual mandate review. This sets the Bank of England apart from the other major central banks. The Bank of England considers its enlarged mandate as its duty to assume an active climate policy role, which it aims to do through, for example, bond purchases: "we believe it is possible to adjust the composition of our Corporate Bond Purchase Scheme (CBPS) to support net zero without compromising the Scheme's primary monetary policy purposes. Doing so lies clearly within the MPC's revised remit, and can be justified by noting that current market prices do not yet fully reflect the inevitable increase in the shadow carbon price".*[44]*

The Bank of England wants to assume a leading role in ensuring the resilience of the financial system and economy through the implementation of its monetary policy as well as a supporting role in the transition to a net-zero economy.[45] In that regard, the Bank of England supports the Task Force on Climate-Related Financial Disclosures (TCFD) in establishing, and the government in implementing,

[40] ECB (2022)
[41] https://www.cnb.cz/export/sites/cnb/en/legislation/.galleries/acts/act_on_cnb.pdf
[42] Rusnok, Jiří (2021)
[43] www.ngfs.net/en/about-us/membership
[44] Hauser, Andrew (2021)
[45] www.bankofengland.co.uk/climate-change

mandatory disclosure requirements.[46] The Bank of England first issued a report in 2020 on its approach to climate-related risk management for all its operations on the basis of the TCFD recommendations.[47] The Bank of England also plans to investigate the resilience of banks, insurers and the UK financial system within various NGFS scenarios.[48]

Sveriges Riksbank

The legal mandate of Sveriges Riksbank (Sweden's central bank) comprises the two goals of price stability and a secure and efficient payment system (Sveriges Riksbank Act, Art. 2), whereas it has no subordinate goal of supporting economic policy in any other way. The Riksbank has stated on several occasions how it takes sustainability aspects into account for its monetary policy in the context of its mandate.[49] This primarily involves assessing the effects of climate change on the economy as well as managing the resulting risks to financial stability.

Since 2019, it has applied issuer criteria to its investment portfolio (foreign and domestic currency). This led to the exclusion of Australian states and Canadian provinces, such as Alberta, Queensland and Western Australia.[50] The Riksbank has reported the CO_2 intensity of the operations of the bond issuers on its balance sheet since 2021, thus disclosing its own climate-related risks.[51] It applies norm-based negative screening to its corporate bond purchases. In other words, the Riksbank excludes the purchase of corporate bonds if the issuer fails to meet certain international standards and sustainability norms. The Riksbank only purchases corporate bonds from Swedish non-financial companies in Swedish krona. It justifies the exclusion of certain corporate bonds with the need to limit its own financial risks in terms of sustainability, as the Riksbank sees climate-related risks as not always being fully priced in by the market.[52] In addition, the Riksbank plans to report on its operations based on the TCFD recommendations.[53] Micro and macroprudential supervision with regard to financial system stability, however, lies within the remit of the Swedish financial supervisory authority "Finansinspektionen".

Danmarks Nationalbank

Danmarks Nationalbank pursues three main goals: stable prices, safe payments and a stable financial system.[54] As with the Sveriges Riksbank mandate, the Danish central bank has no secondary goal of supporting general economic policy.

The consideration of climate risks within monetary policy mainly involves analysing the economic impact and risks for financial stability. The Danish central bank clearly rejects the use of monetary policy instruments to promote climate-friendly structural change, for example by favouring green activities in its bond purchases or risk assessment, citing information issues, a conflict of objectives with monetary policy and a lack of democratic legitimacy.[55] The central bank does go beyond a purely analytical risk-based approach to climate change by observing some sustainability criteria in the management of its foreign currency reserves, held to ensure the exchange rate of the krone against the euro; it also excludes companies in breach of the UN Global Compact Principles for Responsible Investment.

Federal Reserve (Fed)

The Fed pursues three goals equally: "maximum employment", "stable prices" and "moderate long-term interest rates". Its mandate does not include any additional support for general economic policy. The Fed has therefore restricted its monetary policy measures and evaluations to the parameters of its mandate and has clearly stated that an active orientation of monetary policy towards sustainability

[46] Bailey, Andrew (2021)
[47] Bank of England (2020)
[48] Three NGFS scenarios are tested over a 30-year horizon as part of the Climate Biennial Exploratory Scenario exercise (CBES).
[49] Riksbank (2020)
[50] Breman, Anna (2020): 13 et seq.
[51] https://www.riksbank.se/en-gb/about-the-riksbank/the-riksbanks-work-on-sustainability/asset-management-and-sustainability/
[52] Andersson, Magnus and Stenström, Mikael (2021): 7
[53] Ferlin, Maria et al. (2021): 20
[54] https://www.nationalbanken.dk/en/about_danmarks_nationalbank/objectives/Pages/default.aspx
[55] Krogstrup, Signe (2021): 9 et seq.

considerations is not covered by the mandate. The Fed analyses the consequences of climate risks for monetary policy but does not conduct monetary policy with a view to influencing climate change.[56]

It does this by developing scenario analyses to assess the financial risk of climate change and the resilience of individual financial institutions and the financial system.[57] The Fed therefore mainly examines these climate change risks in relation to financial stability. It has set up two committees for that purpose: the Supervision Climate Committee (SCC) investigates the resilience of individual supervised entities from a microprudential perspective. The Financial Stability Climate Committee (FSCC) analyses the impact on financial stability from the macroprudential perspective.[58] The Fed also considers providing support to individual banks in assessing climate risks.

Bank of Japan

The law confers two equally important goals on the Bank of Japan. It must ensure stable prices and financial system stability and, in doing so, follow a monetary policy that is compatible with the government's economic policy.[59] The Bank of Japan published its new monetary policy strategy on 16 July 2021, which addresses climate-related financial risks.[60] One key point in the policy is the position of the Bank of Japan's assumption that the negative effects of activities harmful to the environment and climate are not accurately reflected in market prices.[61] The Bank therefore advises financial institutions to implement the TCFD disclosure recommendations. It also wants to support financial institutions in identifying and managing climate-related financial risks. The Bank has set up a programme whereby financial institutions providing climate-friendly loans or making climate-friendly investments can access funding at preferential rates.[62]

Conclusion

The analysis in this chapter shows that almost all central banks see addressing climate factors as part of their remit. At the same time, they do so within very different contexts. At one end of the spectrum are institutions like the Fed, which essentially restrict their actions to analysing the effects of climate risks on monetary policy and financial stability, at the other end are the central banks assigned an active role in supporting governments' sustainability policies, such as the ECB or Bank of England.

One explanation for the differing positions adopted by the central banks lies within the mandates: the broader the mandate, the more scope for action. The tendency appears to be that with dual mandates, whereby the central bank has a subordinate goal of supporting general economic policy in addition to its primary goal of stable prices, the central bank can assume a more active role in considering climate issues than with mandates that stick closely to the primary goal of price stability. The ECB and the Bank of England mention their obligation to support economic policy in addition to risk considerations, when justifying the increased incorporation of climate-related factors in the structuring of monetary policy instruments.

Besides mandate scope, the different central bank risk assessments are also crucial, insofar as they consider it appropriate to give more weight to climate factors when structuring their monetary policy instruments. For example, the growing role of climate criteria in corporate bond purchasing decisions by some central banks (e.g. ECB, Bank of England, Sveriges Riksbank, Bank of Japan) is because they do not believe that climate risks are fully priced in by the market.

There are also differing views regarding the ability of central banks to consider or correct market failure resulting from non-internalised costs. There is no consensus as to whether central bank interventions actually help or whether they do more harm than good (see Box 4). Those central banks

[56] Powell, Jerome (2021): 1
[57] Brainard, Lael (2021b): 3 et seq.
[58] Brainard, Lael (2021a): 3 et seq.
[59] https://www.japaneselawtranslation.go.jp/en/laws/view/3788
[60] Bank of Japan (2021)
[61] Haruhiko, Kuroda (2021) 3 et seq.
[62] Haruhiko, Kuroda (2021): 5 et seq.

that take a critical view of such interventions tend to be more restrained in their application of commensurate concepts and instruments.

5 Mandate of the SNB

5.1 Mandate

The mandate of the SNB is to pursue a monetary policy which serves the general interest of the country (Art. 99 para. 2 FC).[63] While the earlier provision (Art. 39 para. 3a FC) named several central bank tasks as coming under the remit of the SNB, the current monetary article (Art. 99 FC) restricts the SNB to the fundamental central bank task of managing monetary policy. However, as this constitutional duty is still rather broad, it had to be specified in legislation. Art. 5 para. 1 of the National Bank Act (NBA) states that the SNB must ensure price stability (avoid inflation and deflation). In so doing, it must take account of economic developments. This provision forms the core of the SNB mandate and at the same time the legal framework behind its entire remit.[64]

Pursuit of a monetary policy which serves the general interest of the country: ensuring price stability (taking due account of economic developments)

Based on this statutory provision, Parliament basically followed the expert group "Reform der Währungsordnung" (reform of the monetary constitution) and the Federal Council in its comprehensive revision of the National Bank Act in 2003, by making price stability the first priority under the law, while at the same time obliging the SNB to take economic developments into account in its pursuit of price stability. The inclusion of other goals (an employment goal) was waived.[65] This regulation is based on the recognition that the primary task of a central bank is to control the money-creation process. Controlling the supply of money means exercising major influence on price stability, making the SNB the obvious choice.

Price stability is an important component of economic growth and prosperity. In its pursuit of price stability, the SNB creates the operating conditions that enable the economy to plan reliably and exploit its production potential to the full. Monetary policy also has, at least in the short term, an impact on the economy. The SNB's duty to consider the economy within its remit to ensure price stability makes it partially responsible for real economic development under its mandate. This gives it some leeway to consider output and employment development in its pursuit of price stability.[66] The SNB has been allocated instruments specifically designed for achieving that objective.

Insofar as the SNB strives to ensure price stability, it creates the conditions for economic growth and prosperity, thus making a fundamental contribution to providing the government and Parliament with the leeway to work towards social or environmental objectives.

"General interest of the country": no basis for supporting other Federal Council and Parliament goals

As mentioned above, the SNB has to conduct its monetary policy in the "general interest of the country", thus making an important contribution to a stable economic operating environment in Switzerland.

The term "in the general interest of the country" refers to the conduct of monetary policy and the objective of "price stability" while taking account of economic developments. This formulation contains a constitutional objective pertaining to monetary policy duties.[67] It states that the SNB must deploy its resources to ensure optimal monetary framework conditions for the economy.[68] It also stipulates that monetary policy must be oriented to the needs of the Swiss economy as a whole and that particular interests of individual regions or sectors are not to be taken into consideration.[69]

[63] Dispatch of 26 June 2002 on the revision of the National Bank Act (NBA) BBl **2002** I 6097: 6107
[64] Kessler, Christina (2021): N 15 on Art. 5 para. 1 of the NBA
[65] Federal Council (2016): 7; Kuhn, Hans (2007): 538 et seq.; Kessler, Christina (2021): N 14 on Art. 5 of the NBA
[66] In full: Message on the NBA, FG **2002** I 6097: 6180 et seq.; Federal Council (2016): 10
[67] Biaggini, Giovanni (2007), N 9 on Art. 99 of the FC
[68] NBA dispatch, BBl **2002** I 6097: 6179
[69] In full: Message on the NBA, FG **2002** I 6097: 6179 et seq.; Kessler, Christina (2021): N 27 on Art. 5 NBA

On the other hand, the formulation "general interest of the country" does not include any other goal beyond the creation of optimal monetary framework conditions for the entire Swiss economy. There is nothing in the wording of Article 99 paragraph 2 of the FC or in the statutory requirements that could be inferred as giving the SNB a basis for being able or obliged to use its allocated instruments to pursue other goals or tasks. That still applies even if such goals were to be in the overall interest of the country in a specific instance.

The SNB has no grounds on which to use its instruments for the pursuit of additional (economic) policy or other social goals of the Federal Council or Parliament. That would not conform to the principle of legality or the constitutionally enshrined independence of the SNB (see Box Box **5**). A different interpretation would result in the SNB being able to set any other goals it wanted. An expansion of the mandate would require as a minimum an amendment of the law and, depending on the nature of the expansion, a constitutional amendment may even be needed.

The use of scope for action within the mandate or task fulfilment is a separate issue, i.e. scope for action available to the SNB in the conduct of its monetary policy in the general interest of the country, subject to ensuring price stability and taking account of economic developments. It is up to the SNB to evaluate whether there is scope for action within the mandate and how this scope should be used. Chapters 6 to 8 on the specific remit of the SNB each address the possible scope for action (see, for example, chapter 8.3.3 with regard to exclusion policy).

Box 5

Independence of the SNB

The independence of a central bank is an essential requirement for managing a successful stability-oriented monetary policy. Independence is not an end in itself. Experience shows that central banks that are not independent often act under political pressure to pursue other economic goals, thereby inevitably overshadowing price stability. The outcome is rapidly rising and more volatile consumer prices. This makes it harder to optimise the productive capacity of labour and capital. Inflation also causes the redistribution of income and wealth. An independent central bank is best placed to take unpopular measures should they be necessary to maintain price stability.[70] In the absence of independence, the risk arises of instrumentalisation through politics.[71]

Independence is an important feature of the SNB: the Bank is not permitted to seek or accept instructions either from the Federal Council or from the Federal Assembly or any other body in fulfilling its monetary tasks (Art. 6 NBA) (task-related independence).[72] In the context of the total revision of the Federal Constitution in 1998, the legislator decided to expressly enshrine the independence of the SNB in the Federal Constitution (Art. 99 para. 2 FC). This should ensure the SNB's position as an independent body of the Confederation for the conduct of monetary policy.[73]

There are two conditions to democratically legitimise the independence of the SNB: the first is a clear mandate limiting the SNB's scope for action. The second requirement is comprehensive accountability to make the SNB's actions transparent and understandable to third parties.[74]

The accountability incumbent on the SNB under Art. 7 of the NBA constitutes – beside the clear, limiting mandate – the counterweight to the strong independence and associated scope for action with regard to monetary policy.[75] Through its obligation to inform regularly about its policy and render account of the fulfilment of its tasks, its operations have the democratic legitimacy required in a constitutional state and its operations become transparent.[76] Accountability also ensures that the SNB must be very specific about how it has fulfilled its mandate. Accountability is divided into three parts: the SNB is accountable to the Federal Council (Art. 7 para. 1 of the NBA) and the Federal Assembly

[70] Kessler, Christina (2021): N 41 on Art. 5 of the NBA
[71] Federal Council (2016): 15; Kessler, Christina (2021): N 41 on Art. 5 of the NBA
[72] NBA dispatch, BBl **2002** I 6097: 6106
[73] NBA dispatch, BBl **2002** I 6097: 6107
[74] NBA dispatch, BBl **2002** I 6097: 6107; Federal Council (2016): 16
[75] NBA dispatch, BBl **2002** I 6097: 6109; Senn, Myriam and Scholl, Kathrin (2021): N 6 on Art. 7 of the NBA
[76] NBA dispatch, BBl **2002** I 6097: 6109; Bundesrat (2016): 16

(Art. 7 para. 2 of the NBA), and it also has to regularly inform the public about its monetary policy (Art. 7 para. 3 of the NBA).

5.2 Tasks

The SNB tasks outlined in Art. 5 para. 2-4 of the NBA stem directly from the mandate (see 5.1). That means they must fall within the legal scope of the Federal Constitution (Art. 99 para. 2 of the FC) and the corresponding legal definition (Art. 5 para. 1 of the NBA), i.e. they may not jeopardise the execution of the mandate or the independence of the SNB.[77]

Art. 5 para. 2 lists the SNB's tasks. Besides monetary policy in the narrower sense of the term, management of the currency reserves (Art. 5 para. 2 let. d of the NBA) and the SNB's contribution to the stability of the financial system (Art. 5 para. 2 let. e of the NBA) are key to the subject of this report, i.e. how the SNB handles climate risks and whether the mandate should authorise it to play a more active role in supporting the Confederation's climate goals.

There is consensus that the SNB must take account of climate risks and the effects of climate change in exercising its mandate, to the extent required for ensuring price stability (see chapter 6) and for performing its tasks (chapters 7 and 8). Adequate risk consideration – i.e. identification, analysis and management – is incumbent on the SNB.

Managing currency reserves

The currency reserves represent the largest asset on the SNB's balance sheet. They are closely linked with SNB monetary policy. In the current situation, currency reserves are the result of monetary policy, specifically the foreign exchange market operations conducted by the SNB.

The SNB must manage its currency reserves. Its investment policy is based on high liquidity and broad diversification and is subordinate to monetary policy. As a result, the SNB has to hold a high proportion of secure and liquid assets. The SNB explains the fundamentals of its investment policy, the eligible asset classes and instruments as well as the investment and risk management process in its Investment Policy Guidelines.[78]

Otherwise, the responsibilities outlined under chapter 5.1 apply to currency reserve management, i.e. the SNB, as an independent central bank, must align the management of its currency reserves exclusively with its monetary goals with no exceptions, such as Federal Council climate policy goals.

In managing its currency reserves, the SNB also has to implement risk control processes which adequately cover all the financial risks, including climate-related ones. See chapter 8 for further information on asset management.

Contribution to financial system stability (financial stability)

Financial stability means that the financial system participants, especially banks and financial market infrastructures, are able to function normally and are resilient in the face of potential adverse events. It is an important prerequisite for the development of the real economy and for effective monetary policy implementation.

Art. 5 para. 2 let. e of the NBA confers on the SNB the task of contributing to the stability of the financial system. The SNB fulfils its responsibility with regard to financial stability by analysing potential hazards to the financial system and identifying any need for action. It also contributes to structuring and implementing the regulatory framework requirements for the financial centre. Finally, the SNB is responsible for overseeing systemically important financial market infrastructures (Art. 19 et seq. of the

[77] Biaggini, Giovanni (2007): N 11 on Art. 99 of the FC
[78] SNB (2022a)

NBA) – another task directly linked to financial stability. Chapter 7 addresses financial stability in more detail.

6 Ensuring price stability

As mentioned in chapter 5, the goal of ensuring price stability while taking account of economic developments is the core of the SNB's mandate.

6.1 Climate risks and price stability

When shaping monetary policy with a view to ensuring price stability, the SNB must take account of possible effects of climate change on the economy, as they can influence price development. Climate change is a structural and global phenomenon that can entail numerous social and economic changes along with the concomitant risks. There are two main risks to contend with when managing monetary policy: physical risks and transitional risks (see chapter 3). Both risks are significant in monetary policy terms as they can impact the economy. Effects of climate change plus any associated risks affecting monetary policy can, for example, take the form of higher or more volatile inflation or a reduction of potential output in the economy as a whole.[79] In addition, climate change and climate policy measures can affect the monetary policy transition mechanism, i.e. the transfer of monetary policy impulses to economic development.

This is why monetary policy must include a comprehensive understanding of any effects associated with climate change and why these effects need to be integrated into monetary policy analysis methods and forecast models. The inclusion of climate change in monetary policy analysis is similar to other medium to long-term changes impacting the economy from the outside, such as technical progress or demographic development.

By giving more weight to climate-related effects in its monetary policy analysis, the SNB ensures that it can best fulfil its mandate of price stability, even under changing conditions.

6.2 Taking account of climate risks in the SNB's monetary policy analyses

The SNB is guided by its monetary policy strategy in implementing its legal monetary policy mandate. It comprises the following elements: a definition of price stability, a conditional inflation forecast over the next three years and the SNB policy rate. The conditional inflation forecast for Switzerland is published as part of its quarterly monetary policy assessment and is based on a scenario of future international economic developments. Various economic and statistical forecast models are used for the assessment.

As part of its monetary policy implementation, the SNB influences the interest rate level on the Swiss franc money market with the aim of maintaining the short-term secured money market interest rate in francs close to the SNB policy rate.[80] This involves charging interest on sight deposits held by commercial banks at the SNB, and through monetary policy repo transactions. The SNB also intervenes on the foreign exchange market when necessary in order to directly influence the exchange rate. The interest rate, together with the exchange rate, determines the monetary conditions. Both SNB monetary policy repo transactions and foreign exchange transactions influence the amount and composition of the assets on its balance sheet.[81] The SNB balance sheet therefore reflects the implementation of monetary policy. Chapter 8 addresses the SNB's investment policy.

[79] Reduced potential output could reduce the neutral real interest rate in certain circumstances. This would limit the monetary impact of policy rate reductions. This would result in unconventional monetary policy measures having to be taken, see Deutsche Bundesbank (2022): 34 et seq.
[80] Maechler, Andréa und Moser, Thomas (2020) explain how the SNB's monetary policy is implemented in the current negative interest environment.
[81] SNB (2021a)

A stable monetary policy transmission mechanism is an important condition for implementing monetary policy. This can be affected by climate change and climate policy measures, as they influence bank balance sheets, the valuation of assets and the expectations of economic actors. The effectiveness of monetary policy transmission channels can be impeded through an increase in stranded assets or heightened credit risks following climate events. As the financial system is an important part of the transmission mechanism, abrupt climate-induced value impairments could weigh on banks' balance sheets and restrict their ability to provide credit. That is why financial stability, which is outlined in chapter 7, is an important condition for implementing monetary policy to ensure price stability.

Taking account of physical risks

Structuring monetary policy in order to ensure price stability can be influenced by physical risks arising directly from climate change. The impact of these risks on economic developments and the price level can be long-term (chronic) or event-related (acute). Examples include impaired economic performance over time due to higher temperatures, or temporary food shortages as a result of flooding.

Chronic physical risks are implicitly included in the SNB forecast models over time by adjusting the parameters, as are other longer-term, gradual changes. The SNB has a number of forecast models that vary in terms of the structure and number of variables included in the forecast. The parameters in these forecast models are based on historical observations of inflation, the real economy and other variables. For example, lower performance by agriculture or tourism in Switzerland would (ceterus paribus) lead over time to a lower valuation of Swiss productivity growth in the models.[82] As a result, projected economic growth in the models would also fall over time. The consequences of chronic physical risks thus flow successively into monetary policy forecasts.[83] In addition, other explicit physical risk transmission channels can be modelled. This can lead in particular to relative price movements through chronic physical risks, if certain goods, for example foodstuffs, could only be produced at higher cost in the future. On the whole, however, chronic physical risks only have a gradual impact over time. Moreover, future physical risks depend on political measures and their effectiveness in reducing CO_2 levels in the atmosphere. Policy measures are, however, difficult to predict. Given this uncertainty, one set of NGFS scenarios is used to assess these risks. These scenarios contain various assumptions in terms of future climate-political measures (see chapter 3.2).

By contrast, acute physical risks such as floods, drought or hurricanes have a sudden impact. Due to climate change, acute physical risks may become more common in the future depending on the climate scenario. They can directly weaken the economy, for example by destroying harvests and infrastructure, disrupting supply chains or affecting tourism revenue. These production shortfalls may lead in turn to increased price fluctuations, especially in housing, energy and food. That makes them relevant to monetary policy in the short term.

Some of the effects of global climate change are already apparent. Take, for example, the increased frequency and intensity of extreme weather events, such as heatwaves, droughts and heavy rainfall. These effects are also apparent in Switzerland. Furthermore, extreme weather events in other countries may affect the economy indirectly via economic linkages and increase inflation in Switzerland. Economic crises resulting from extreme weather events may also impact Switzerland via the Swiss franc exchange rate if uncertainty among financial market participants causes them to turn to the Swiss safe haven, leading to increased inflows of funds.

To date, acute physical risks such as extreme weather events have not caused any adjustment of the SNB's inflation forecast or of monetary policy in Switzerland. However, the SNB is closely monitoring developments both within and outside Switzerland and includes events in its evaluation of the course of inflation when necessary. It also regularly evaluates its methods of analysis and adjusts them as

[82] NGFS (2020) for an overview of the effects of climate change on macroeconomic variables
[83] Chronic physical risks are currently incorporated into the NGFS scenarios as negative productivity shocks. Depending on the country, these negative productivity shocks vary in intensity, as each country is and will continue to be affected to varying levels by climate change.

required.[84] Uncertainty regarding the occurrence of extreme weather events in the future, however, remains considerable, so it is hard to predict when they will occur and with what severity. That makes it hard to factor them into the SNB's baseline (most probable) forecast prior to their occurrence. However, the uncertainty can be illustrated and analysed through scenarios outlining the possible consequences of a physical change triggered by climate change.

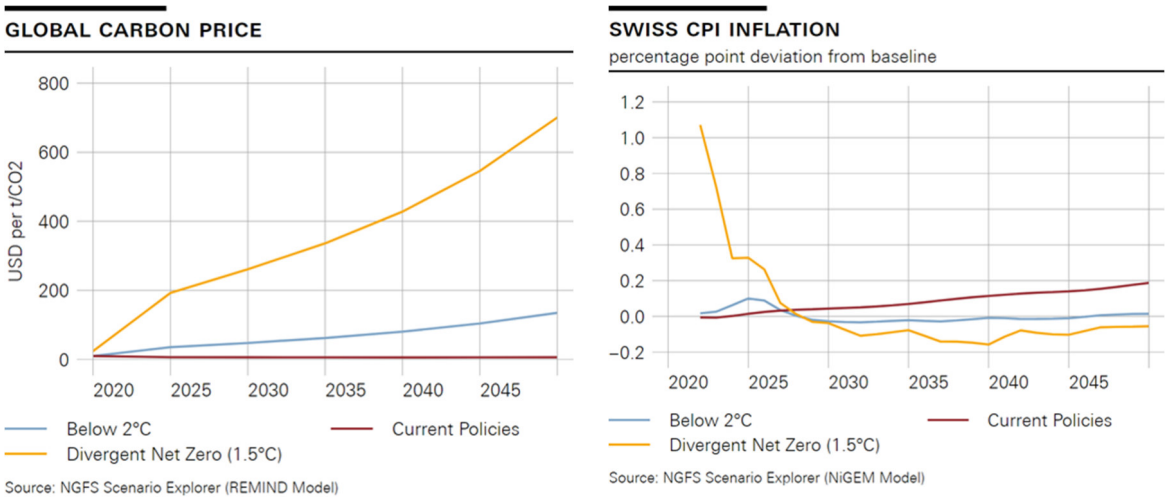
Taking account of transition risks

When considering transition risks in monetary policy, the SNB takes a similar approach to the one it uses for other economic and structural policy adjustments. Policy adjustments are made as soon as possible and included in analyses and forecasts. Long-term forecasts regarding the timing and extent of policy measures, however, cannot be made with sufficient reliability. That is why they are usually only included in the SNB's basic forecast when the policymakers have considered and approved specific measures. For example, the increase in the CO_2 tax from CHF 96 to CHF 120 per ton as of 1 January 2022 was included in the SNB inflation forecast from the time of its announcement in July 2021.[85] The SNB forecast model issues separate forecasts for many index positions in the Swiss Consumer Price Index (CPI) for the short term, including for gas and heating oil. These separate forecasts are then aggregated with their weightings in the CPI basket for inflation forecasting and provide an indication for inflation dynamics in the short term. Following the announcement of the increase in the CO_2 tax in July 2021, the higher tax was converted into higher prices for the gas and heating oil index positions for January 2022. This led to a higher inflation forecast from January 2022.

The policy adjustments connected to climate change, resulting for example from the commitment under the Paris Agreement, may also push inflation higher in future, so scenarios are very helpful to understanding the transmission and effects of these policy adjustments. The following NGFS scenarios illustrate this through a higher global CO_2 tax. In the event that policymakers increase the CO_2 tax, higher inflation should be expected. Chart 2 presents the global CO_2 price (left-hand chart) and CPI inflation in Switzerland (right-hand chart) up to 2050 for three NGFS scenarios: "below 2°C", "current policies" and "divergent net zero (1.5℃)",. The NGFS has calculated global CO_2 prices with climate models, known as integrated assessment models (IAMs), and the resulting Swiss inflation with a macroeconomic multi-country model (NiGEM). The CO_2 price increases the most with the "divergent net zero (1.5℃)" scenario as it assumes a maximum temperature increase of 1.5℃. In "current policies" by contrast, the assumption is that only already implemented policy measures will be maintained going forward. But there will be no new measures. The "divergent net zero (1.5℃)" scenario in particular includes a marked and persistent rise in inflation. According to NGFS forecasts, monetary policy can still keep inflation in check even in this scenario with a moderate rise in interest rates compatible with price stability. Overall, the NGFS scenario forecasts, as mentioned above, entail considerable uncertainty due to the complexity of the interplay between climate and economy plus the long time horizon.

[84] NGFS (2022) provides an overview of the current status of work on climate scenarios.
[85] Federal Council (2021c)

Figure 2: Global CO_2 price and CPI inflation in Switzerland



Monetary policy assessment and conditional inflation forecast

As part of its quarterly monetary policy assessment, the SNB regularly checks whether its monetary policy is compatible with maintaining price stability while taking account of economic developments. It bases the assessment on its conditional inflation forecast, which has a 3-year time horizon and thus roughly matches the time needed to transmit monetary stimuli to the economy. Climate-change induced price stability risks, such as CO_2-tax increases, that will occur during this timeframe are thus included in the monetary policy assessment. In addition, physical and transitional risks whose probability of occurrence is uncertain are analysed via scenarios.

6.3 Conclusion

As climate developments and climate policy measures can have far-reaching consequences for the economy and price stability, their incorporation into monetary policy analysis is crucial to the optimum performance of the monetary policy mandate under changing conditions. The SNB therefore continually refines its methods of analysis and forecasting models.

On the other hand, calls to consider climate aspects beyond the context of monetary policy analysis and orient monetary policy instruments actively towards climate goals, for example in order to give preference to climate-friendly activities and/or reduce practices that are harmful to the climate, are not compatible with the SNB's mandate. The scope for action under the mandate is limited and falls within the SNB's remit (see chapter 5).

As explained in chapter 5, the legality principle stands in opposition to the unilateral expansion of the SNB's mandate, whether to promote or impede specific economic activities.

An extension of the mandate risks causing conflict between the goal of price stability and the pursuit of climate-related objectives. For example, a central bank would have to divest itself of bonds or equities purchased for environmental reasons if necessitated by monetary policy considerations. Moreover, monetary policy instruments are designed to ensure price stability. They affect the money supply and, as a result, the interest and exchange rate conditions for the entire economy. The SNB's monetary policy instruments are not designed to achieve climate policy goals.

By fulfilling its monetary policy mandate – ensuring stable prices while taking account of economic developments – the SNB contributes to stable economic operating conditions in Switzerland. This is fundamental to allowing the government as well as companies and private individuals the scope to act in pursuing their goals in the field of sustainability and elsewhere.

7 Financial stability

The SNB is responsible under its legal mandate (see chapter 5) for contributing to the stability of the financial system. Financial stability means that financial system participants, i.e. financial intermediaries (especially banks) and financial market infrastructures can carry out their functions and are resilient in the face of disruption. Financial stability is important for economic growth and for the effective implementation of monetary policy. The SNB performs its duty in the area of financial stability by analysing the hazards facing the financial system and identifying any need for action.

The SNB also analyses climate-related risks to financial stability in this context. In so doing, the SNB focuses mainly on whether the banking system and systemically important financial market infrastructures are adequately prepared for climate-related shocks and whether climate risks are sufficiently covered by existing regulation. The resulting analyses and evaluations are published in the annual Financial Stability Report.[86]

The SNB works closely with the Swiss Financial Market Supervisory Authority (FINMA) and Federal Department of Finance (FDF) to create a regulatory framework conducive to stability. It adopts a primarily systemic perspective, i.e. it monitors developments in the banking sector from the perspective of the system as a whole by focusing on the macroprudential aspects of regulation. The SNB has been assigned three regulatory macroprudential competencies: to designate banks as systemically important, designate financial market infrastructures as systemically important and the authority to propose the activation, adjustment or deactivation of the countercyclical capital buffer.

FINMA is primarily responsible for supervising individual institutions and ensuring the smooth functioning of financial markets (microprudential supervision). The SNB therefore does not perform any banking supervision, nor is it responsible for issuing or enforcing Swiss banking legislation. These competencies come under FINMA‘s and/or the Federal Council's or Parliament's jurisdiction.

The main avenues of cooperation between the authorities are set out in a bilateral Memorandum of Understanding with FINMA and in a trilateral Memorandum of Understanding with FINMA and the FDF.[87] With regard to financial market infrastructures, the SNB was ultimately granted direct powers of oversight over systemically important financial market infrastructures – in parallel with FINMA and in contrast to the banking sector.

At the international level, the SNB participates in the activities of the Network for Greening the Financial System (NGFS) to define methods and best practices for central banks to evaluate climate-related risks (see chapter 3.2). As a longstanding member of the Basel Committee on Banking Supervision (BCBS)[88] the SNB also contributes to its work on integrating climate-related risks into banking supervision. The committee is currently investigating the extent to which climate financial risks can be approached within the current Basel Framework, where the framework may contain shortfalls and which measures can be employed to rectify those shortfalls.[89]

7.1 Climate risks and financial stability

Climate risks do not per se pose a threat to financial stability if they influence economic variables like prices, interest rates, production and employment over an extended period and the change is ongoing and predictable. However, unexpected policy measures or sudden shifts in expectations about future

[86] SNB (2022d).
[87] https://www.snb.ch/en/mmr/reference/mofu/source/MoU_EN.pdf
[88] The BIS has exclusions for various issues. The BCBS mandate is to strengthen financial stability through banking supervision. Within this framework it also deals with issues arising from climate-related and environmental risks. The committee comprises representatives of central banks and supervisory authorities. The SNB is also in this committee, as is FINMA. Both institutions actively participate in the work of the BCBS.
[89] BCBS (2021)

political measures as well as extensive losses through physical risks trigger sudden changes in assets.[90] This can lead to banking losses, for example through writedowns on loans to particularly exposed companies or trading losses due to equity and bond market corrections. This could cause financial intermediaries that are heavy borrowers to fall into difficulty and endanger financial stability.

In terms of financial stability, the SNB focuses mainly on the question of whether the banking system and systemically important financial market infrastructures are adequately prepared for various climate scenarios and whether the climate risks are sufficiently covered by the regulations in force. [91]

With regard to systemically important financial market infrastructures, the SNB focuses mainly on minimising climate-related physical risks that could lead to business interruption. For example, systemically important financial market infrastructures have to distribute their key operational technical facilities over different locations with varying risk profiles. The SNB has therefore called on financial market infrastructure operators to analyse the possible consequences of physical climate risks for their operations and adopt extra measures if necessary.

There are significant challenges involved in measuring climate-related financial risks. There is currently not enough relevant or reliable data on climate-related financial risks of banks and companies. Efforts to introduce disclosure requirements for climate-related information are currently underway at a national and international level (e.g. new legal provisions on non-financial disclosures, TCFD, see chapter 2). Robust scientific methods to quantify key risk drivers are also thin on the ground. The investigation of climate-related financial risks as a cause of systemic financial stability risks thus combines two areas, which are difficult to evaluate and fraught with uncertainty. To address these challenges, the SNB, FINMA and the University of Zurich have jointly conducted an initial pilot to measure the transition risks of large banks.

7.2 Pilot project to measure transition risks

As part of a joint pilot project FINMA and the SNB analysed the effects of different transition scenarios on large bank portfolios for the first time. They had two goals: first, to gather experience of climate-related scenario analyses and, second, to gain an initial snapshot of the climate-related transition risk landscape for large banks. The focus on transition risks in the pilot project is the result of a prioritisation exercise. Firstly, the complexity of the analysis needs to be set in a transparent framework. Secondly, physical risks tend to become more manifest and gain importance in the medium to long term. Thirdly, a major share of large banks' portfolios relates to Switzerland, in spite of their international presence. Relative to other countries and geographic regions, Switzerland has low exposure to economic losses resulting from extreme acute and chronic weather events.[92] Physical risks are nonetheless an important element in assessing climate risks and are due to be considered in a suitable format at a later date.

The SNB and FINMA opted for the approach advocated by Professor Battiston (University of Zurich).[93] This approach was applied to large banks' data in collaboration with the University of Zurich. The analysis required a specific survey of sectoral data on company loans, equities and corporate bonds on large banks' balance sheets.[94] The approach models a sudden change in market participants' expectations regarding future climate-related policy measures. Based on a scenario that does not factor in any new policy measures, market expectations switch to a transition scenario, for example a “net-zero by 2050” scenario or a delayed transition from 2030. The revised expectations of market participants lead to an immediate revaluation of financial instruments on banks' balance sheets. The financial instruments of companies that depend heavily on fossil fuels are particularly affected. [95]

[90] Bolton, Patrick et al. (2020): 7
[91] SNB (2022d)
[92] See, for example, NGFS (2022): 30
[93] Battiston, Stefano et al. (2017)
[94] Assets managed for third parties, loans to private households (e.g. mortgages) and government bonds were not included in the analysis.
[95] SNB (2022d)

The transition scenarios were developed by the Network for Greening the Financial System (NGFS) and now serve as a reference for supervisory authorities. A stress test method by the Netherlands' central bank was also implemented for comparison purposes.[96] The analyses showed that about a quarter of analysed portfolios are exposed to climate-related sectors. These sectors are classified as "fossil fuel", "transportation", "utility" and "energy-intensive".[97] Banks have similar or less exposure to these sectors than the market as a whole (market capitalisation according to a leading global index provider).

7.3 Conclusion

The analyses conducted as part of the pilot project provide an initial assessment of transition risks.[98] However, further work is by FINMA and the SNB is needed in order to acquire a more robust evaluation of the materiality of climate risks. They particularly need to research how to manage long time horizons and measure the impact of climate scenarios on companies and banks. There are currently many methods yielding differing results.[99] It is therefore important to use a variety of methods and compare the results. Analyses by other central banks have also shown that the evaluation of risk materiality depends heavily on the assumption of which policy measures are already factored in by the market – and especially by the banks.[100] Finally, the scope of the analysis needs to be broadened to take account of previously omitted transactions (e.g. mortgages) as well as physical risks. Further research at an international level will make a major contribution to finding answers to the above questions. FINMA and the SNB will develop and improve their current methods for assessing climate risks in close cooperation with the banks.

In terms of financial stability, the SNB contributes in a number of ways to the Confederation's sustainability and climate goals. It endeavours to raise awareness of the issue among banks and the public through its reporting in the Financial Stability Report[101] and by referring to it in speeches. The SNB also helps, in cooperation with FINMA and the FDF, to define the climate-related regulatory operating conditions for the financial sector. In addition, through the joint pilot project on measuring transition risks at large banks, the SNB promotes knowledge exchange among the authorities, with banks and with academia.

[96] Vermeulen, Robert et al. (2018)
[97] The sector definitions correspond to the “climate policy relevant sectors” in Battiston, Stefano et al. (2017)
[98] Neither FINMA nor the SNB have disclosed the specific results of the scenario analysis as per standard practice in stress tests and in view of the fact that only two banks were monitored.
[99] Bingler, Julia and Cholesanti Senni, Chiara (2022)
[100] For example, the Deutsche Bundesbank showed in its 2021 Financial Stability Report that the choice of reference scenario for German banks results in differing transition risks. One reference scenario that does not factor in any further policy measures (NGFS scenario "current policies") results in higher risks than a reference scenario that assumes the pricing-in of measures limiting the temperature rise by the end of 2100 to below 2°C (NGFS scenario "below 2°C")
[101] SNB (2022d)

8 Asset management at the SNB

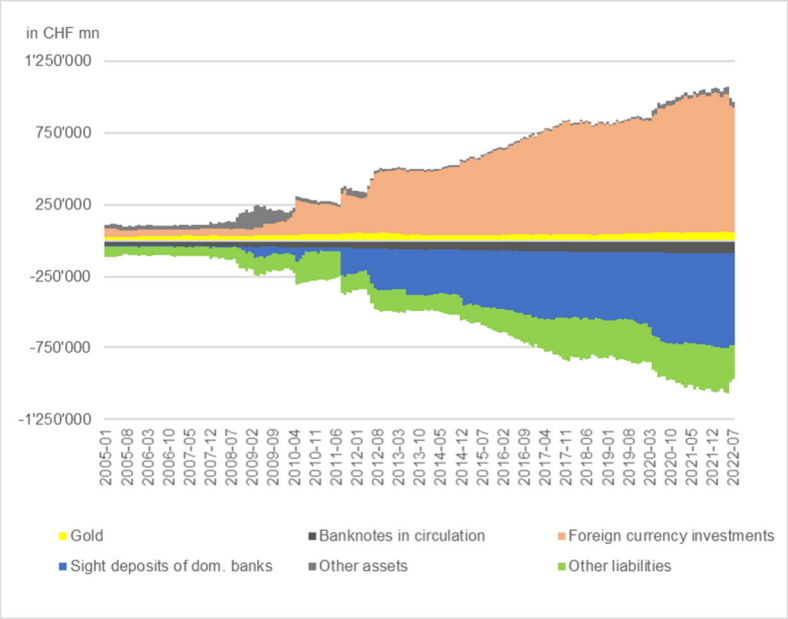
The SNB has accumulated a large volume of currency reserves in recent years following its monetary policy-motivated interventions in the foreign exchange market. These currency reserves (foreign exchange and gold) are to be managed exclusively in line with monetary policy goals (see chapter 5). This chapter provides an overview of asset management at the SNB and shows how the SNB approaches climate-related risks as part of its asset management. The SNB approach to non-financial issues within the goals set under the mandate is also presented.

8.1 Asset overview

The amount and composition of the SNB's assets are determined by monetary policy requirements. The marked increase in recent years stems from the foreign currency purchases made by the SNB to mitigate the upward pressure on the Swiss franc and its tendency to appreciate (see Fig. 3). The foreign exchange market interventions became necessary once the scope for monetary policy via interest rate adjustments was largely exhausted in an environment of zero, and then negative, interest rates.[102]

At the end of 2021, SNB assets amounted to around CHF 1 billion (CHF 1,057 bn).[103] Of that, CHF 966 bn were foreign currency investments (see Table 1). At the start of the 2007/2008 financial crisis, they were below CHF 50 bn. In other words, foreign currency investments increased twentyfold over 15 years. Gold reserves stand at 1,040 tons worth CHF 56 bn. Other foreign currency assets include items denominated in IMF special drawing rights in the IMF in the amount of CHF 15 bn. Other assets are denominated in Swiss francs, including a CHF 4 bn bond portfolio and the guaranteed loan of CHF 9 bn as part of the COVID-19 refinancing facility.

Figure 3: SNB balance sheet items, 2005–2022



Source: Own calculations, SNB data https://data.snb.ch/en/topics/snb/cube/snbbipo

About three quarters of foreign exchange reserves are held in bonds, the other quarter in equities. The proportion of equities in the SNB portfolio has been steadily increased in recent years in order to

[102] For further explanations on the unconventional monetary policy, see Federal Council (2016): 31 et seq.
[103] The figures relating to the SNB assets are from the Annual Report (SNB 2022b) and from earlier editions

maintain the value of the foreign exchange reserves. It was around 10% before the financial crisis.[104]

The foreign currency bond portfolios largely comprise government bonds (about 85% of all bonds), mainly from advanced economies. The other 15% are spread between quasi-government bonds, bonds issued by supranational organisations (e.g. the EU), local authorities, financial institutions (mainly covered bonds and similar instruments) and other companies. The equity portfolios mainly contain equities issued by mid and large-cap companies from advanced economies. There are also equities issued by small caps from advanced economies and equities from emerging economies.

The Swiss franc bond portfolio primarily contains bonds issued by the Confederation, cantons, communes and foreign borrowers, as well as Swiss Pfandbriefe. The SNB only holds equities issued by Swiss companies in specific exceptional cases.[105]

Table 1 SNB – Overview of asset structure

in CHF mn	at 31.12.2021	in %
Total assets	1'056'776	100.0
Gold	55'691	5.3
Foreign currency investments	966'202	91.4
in bonds		75.0
in government bonds		85.0
in other bonds		15.0
in equities		25.0
Reserve position in the IMF	2'001	0.2
International payment instruments	11'912	1.1
Monetary assistance loans	908	0.1
Claims from USD repo transactions	2'147	0.2
Claims from CHF repo transactions	3'216	0.3
CHF securities	4'032	0.4
Secured loans	9'202	0.9
Tangible fixed assets	437	0.0
Financial interests	136	0.0
Other assets	892	0.1

Source: SNB annual report 2021

8.2 Special features of asset management

The SNB differs materially from other investors.[106] It manages foreign exchange reserves,[107] resulting from the objective of ensuring price stability, as opposed to assets arising from the sale of real assets. The assets are offset by a corresponding liability in the form of the money supply or banks' sight deposits (see Fig. 3).[108] The current high foreign exchange reserves held at the SNB result from the foreign currency purchases required in recent years to mitigate the franc's appreciation. The SNB's foreign exchange reserves fulfil a monetary policy function and their management is subordinate to monetary requirements: when the monetary conditions demand it, the SNB must be able to reduce the money supply by selling foreign exchange reserves.[109] In other words: asset management at the SNB is defined by monetary policy.[110] This primacy stems from its mandate (see chapter 5), which sets the parameters within which it must conduct its investment policy, and defines the investment targets and criteria. That is why the SNB must always be in a position to redeploy large volumes without unduly influencing market prices. The SNB therefore holds a high proportion of liquid assets and maintains a broad diversification. Unlike other asset managers, the SNB cannot protect itself from its greatest risk, currency risk. In order to hedge exchange rate risks, the SNB would have to order francs, exercising upward pressure, which could conflict with its monetary policy depending on the situation.[111]

[104] The SNB has a relatively high equity holding relative to other central banks. This is possible as the franc is crisis-proof and tends to appreciate rather than depreciate during crises. The SNB is therefore not obliged to sell its "high-risk" assets (equities) at knock-down prices in order to support the franc. Further details are provided in Maechler, Andréa (2017): 4
[105] The SNB has interests in Orell Füssli AG, Landqart AG and a minor holding in the BIS, see SNB (2022b): 192
[106] See Maechler, Andréa and Moser, Thomas (2019): 8
[107] Foreign currency investments, e.g. US dollar, euro
[108] This is entered on the SNB balance sheet under liabilities as "Sight deposits held by banks at the SNB"
[109] This could happen if there were no more pressure on the franc due to a perceptible decrease in global uncertainty or if the interest rate differential were to increase relative to other countries, see Maechler, Andréa and Moser, Thomas (2019): 8
[110] SNB (2022b): 84
[111] Maechler, Andréa (2017): 5 et seq.

The SNB manages assets while being responsible for monetary policy at the same time. This dual role entails the risk of conflicts of interest and unwanted signals to the financial markets.[112]

The SNB meets these hazards by structuring its investment process so that no privileged information can flow into its investment operations and no unwanted signals can arise.[113] It avoids equity investment in systemically important banks worldwide. Likewise, it does not invest in equities or bonds issued by Swiss companies. As the SNB influences Swiss interest rates, it manages the franc bond portfolio in accordance with the rules as per an index and excludes Swiss companies and banks.

Another special feature is that the SNB, unlike commercial banks, does not finance specific projects or grant bilateral loans as part of its asset management; instead it holds marketable and liquid securities. Furthermore, the SNB almost deals exclusively on the secondary equity markets. That means it acquires and holds already outstanding and exchange-traded shares in companies and does not participate in new issues. By maintaining a high degree of market neutrality in its investment activity, the SNB further reduces the risk of unwanted financial market signals.

8.3 Asset management

The SNB follows – in the context of its monetary policy mandate – an investment process structured according to the principles of large institutional asset managers. There are two main objectives that stem from the mandate.[114]

- The SNB ensures that its balance sheet can be used for monetary policy purposes at any time.
- The SNB endeavours to maintain the long-term value of currency reserves.

The SNB bases its investment policy on the principles of high liquidity and broad diversification to achieve these objectives. Highly liquid assets are indispensable to ensure monetary flexibility, which is why the SNB holds a high share of first-class bonds. The SNB strives to maintain the real value of its bond portfolio by diversifying currencies and debtor countries. It also complements the bond portfolio with a diversified equity portfolio to improve the long-term return/risk ratio.

Box 6

Why does the SNB complement its bond portfolio with an equity portfolio?
The Swiss franc has appreciated against most other currencies in the past.[115] Following the 2007/2008 financial crisis, the tendency to appreciate increased significantly at times, both in nominal and in real terms, i.e. taking account of the different price developments in individual countries. As all the SNB's assets are valued in francs, the return in local currency (euro, dollars etc.) must correspond to the long-term appreciation of the franc, in order for the value of the foreign exchange reserves to be at least maintained.[116]
By investing part of the foreign exchange reserves in a diversified range of equities and corporate bonds, the SNB exploits the positive return contribution of these asset classes without significantly increasing the investment risk. The SNB's equity portfolio has become more important given the historically low bond yields in recent years (see chapter 8.1). At the same time, the SNB ensures that it remains flexible through its diversified range of equities, so it can adapt its investment policy to changing requirements. In recent years, the SNB – in view of its high balance sheet total and the sustained upward pressure on the Swiss franc – has more than doubled the proportion of high-risk assets it holds (particularly equities). However, maintaining very large holdings of very secure and highly liquid government bonds are central to the fulfilment of its monetary policy mandate. Markets

[112] NBA dispatch, BBl **2002** I 6097: 6137 et seq.
[113] For example, members of the investment committee and portfolio management employees are not involved in preparing the monetary policy assessment
[114] SNB (2022b): 84 et seq.; SNB (2022a): 1
[115] See Hildebrand, Philipp (2007) for more information on possible causes of the franc's appreciation
[116] SNB (2022b): 85 et seq.

can move unexpectedly and fast; the SNB must be ready to buy back the Swiss francs it has spent and reduce its foreign exchange reserves accordingly.

The following two sections address bond management (8.3.1) and equity management (8.3.2).

8.3.1 Bond management

The selection of government bonds and corresponding markets takes account of the SNB's high liquidity and creditworthiness requirements.[117] The SNB's bond portfolio accordingly contains a significant proportion of highly liquid US government bonds denominated in USD and German government bonds in euros. It also holds government bonds issued by various other countries in different currencies. The investments are spread over different maturities within an individual market, so that large volumes can be bought or sold when necessary and without influencing prices as far as possible. In addition, about 15% of the bond portfolio is made up of less liquid corporate bonds and bonds in quasi-government institutions, supranational organisations (e.g. the EU) and local authorities.

Credit risks low due to high creditworthiness

Credit risks are low on bonds in the SNB portfolio. That is because the debtor structure has very good creditworthiness with a high proportion of public sector borrowers. About 80% of bonds held by the SNB have an AAA or AA rating and a further 15% are rated A.[118] The SNB maintains a consistently high credit quality for bonds by requiring "investment grade" as a minimum rating. If bonds in the SNB portfolio fall below investment grade, they are sold.

Bonds in foreign currencies are actively managed based on an index. As the corporate bond indices in particular have a very high share of securities that are also illiquid to an extent, full market coverage would be inefficient. Moreover, as those companies with the largest weightings in the index have the most outstanding debt, deviations from the index weightings can also be prudent from a risk perspective.

As part of the investment process, the portfolio management unit at the SNB performs a comprehensive bond risk assessment, covering all financial risks – and thus also climate risks.[119] The SNB uses, inter alia, the leading rating agencies for its risk assessment.

Green bond investments within the normal investment process

The SNB has been investing in green bonds for years as part of its investment strategy based on well diversified market coverage plus high liquidity and creditworthiness, whereby the portfolio share approximately corresponds to that of the benchmark.[120] As the name suggests, these are bonds used to finance ecological projects. The portfolio management unit purchases these bonds as part of its normal risk/return considerations. Analyses show that green bond issuers themselves do not necessarily act more sustainably than issuers of other bonds.[121] These investments would only have a positive effect on the climate under certain conditions, for example if the green projects would not have been initiated without issuing green bonds and the projects are good for the climate.

[117] Maechler, Andréa and Moser, Thomas (2019): 8 et seq.
[118] SNB (2022b): 95
[119] Maechler, Andréa and Moser, Thomas (2019): 10
[120] SNB (2021b)
[121] E.g. Ehlers, Torsten et al. (2020)

Box 7

Rating agencies and climate risks

The SNB uses the leading rating agencies as a basis for its risk assessment. There is currently a discussion among central banks and the NGFS as to whether ratings sufficiently reflect climate risks. With regard to the bond holding at the SNB, the following picture emerges: the biggest share of bonds held by the SNB comprises government bonds issued by leading advanced economies. These countries are of course exposed to climate change-related risks, just like the private sector. To date, however there is no indication that specific climate-related risks not already included in the creditworthiness evaluations of individual leading advanced economies significantly affect those countries' ability to pay during the term of the bonds.[122]

A new ECB study on corporate bonds shows that ESG risks are normally included in creditworthiness evaluations by rating agencies. With regard to climate risks, for example, the study concludes that the rating agencies have downgraded companies with high transition risks by more than similar companies with lower risks. However, the study also emphasises that the "real" extent of climate-related credit risks may still be greatly underestimated by rating agencies and market participants. It is not possible to definitively assess these risks as the expected climate-related credit risks depend on numerous assumptions about future development (greenhouse gas emissions, policy measures etc.).

8.3.2 Equity management

The SNB manages its equities passively and according to set rules on the basis of a strategic benchmark made up of a combination of equity indices in different markets and currencies. Equity indices can easily be passively followed, as the equities in the indices are normally relatively liquid. Furthermore, the proportion of an equity in the index depends on the company's market capitalisation, which tends to rise with successful companies. The principle of broadly replicating entire markets ensures that the SNB acts as neutrally as possible in the individual equity markets. By waiving active security selection and, as a general rule, also avoiding the over or underweighting of individual sectors, it consciously avoids concentrations in specific companies and sectors. At the same time, the maximised market coverage helps the SNB to invest or divest large volumes when necessary and without major market distortions.[123]

Box 8

Concept of market neutrality

The public policy reasons for a market-neutral approach are set out in the dispatch of the Federal Council on the National Bank Act.[124] It requires the SNB to avoid equity investments that could result in it acquiring major stakes in companies, and to avoid indirectly conducting structural policies by its management of equity investments. According to the dispatch, these regulatory reservations can become more acute through rule-based investing, for example staying close to an index. The legislator has deliberately imposed limits on the SNB: it is not the SNB's role to exercise influence on the development of different economic sectors through its investment policy with the aim of promoting or impeding economic, political or social change.[125]

The market-neutral approach is also beneficial with regard to its long-term risk/return profile. Concentrated exposures to individual companies and sectors beyond the concentrations inherent in the market are avoided. This reduces the overall risk while increasing room for manoeuvre at the same time in case portfolio adjustments are necessary. Monetary policy may require a rapid

[122] Gratcheva, Ekaterina M. et al. (2022)
[123] SNB (2022b): 90.
[124] See 1.4.4.4. "Vermeidung von Ziel- und Interessenkonflikten" (avoiding conflicting goals and interests) in NBA dispatch, BBL **2002** I 6097: 6137 et seq.
[125] NBA dispatch, BBI 2002 I 6097: 6137

expansion or reduction of the balance sheet at any time. In contrast to a portfolio with concentrated positions in individual securities, a market-neutral portfolio with high volumes can also be expanded or reduced very efficiently and with minimal influence on prices.

The market-neutral approach is also highly efficient, as the SNB does not use up resources speculating on the alternative future development of individual companies or sectors. Corresponding studies show that only very few investors succeed over the long term in achieving a higher risk-adjusted return by actively deviating from the general market in a systemic way and after deducting costs.[126]

Broad diversification protects against risks

Broad diversification is also the best way of minimising risk. The diversification of the SNB equity portfolio involves different markets (advanced economies, emerging market countries, small, mid and large caps) as well as broad market coverage within the individual markets. At the end of 2021, the SNB held a global broadly diversified equity portfolio of about 6,700 individual securities (a good 1,400 from mid and large caps and about 4,300 from small caps in advanced economies, and about 1,000 from companies in emerging markets)[127]. Given the broad, even market coverage, the SNB's share of individual mid and large caps is roughly identical across all the advanced economies. In 2021, it was about 0.4%. The corresponding shares of small caps and companies in emerging markets are slightly lower, as these less liquid markets have a slightly smaller weighting in the strategic allocation.

Structure of the equity portfolio follows market developments

The SNB equity portfolio is exposed to different risks – including climate risks – to about the same extent as all the globally listed companies. Through the passive replication of market developments, structural changes of global listed companies are directly reflected in the SNB portfolio. Those companies and sectors that succeed over time automatically receive a higher weighting, while the loss makers' weighting is automatically reduced. If companies that can present a convincing strategy for a low-carbon economy are viewed positively by the markets and their market capitalisation grows, their share in the SNB equity portfolio rises automatically.

The technology sector in mid-2021, for example, had a much higher weighting in the global equity market than before, while the energy sector weighting was reduced. In 2010, the share of companies from the fossil fuel sector in the global equity market came to about 11%, compared to about 5% in 2022. The SNB's equity portfolio mirrors this development because of its passive replication of the market.

Exercising voting rights on equities

The exercise of voting rights is a fundamental responsibility of shareholders. Given its growing balance sheet total and in view of its increasing equity holding, the SNB has come under a growing obligation to meet this responsibility, as it is now a major investor. The SNB has exercised its voting rights for part of its shares since 2015. It currently restricts its voting to mid and large caps from Europe; the inclusion of other countries has not been ruled out. The SNB is working with external service providers to this end. The SNB focuses on matters of good governance when exercising its voting rights.[128] Over the long term, good governance contributes to positive corporate development and in turn to positive equity price development. The SNB does not adopt any position with regard to a company's strategic decisions (e.g. a refocusing of business activities), in keeping with the regulatory principle that the SNB must not pursue any additional political goals beyond its mandate.

The actual vote is based on internal SNB voting guidelines which are reviewed regularly. External service providers interpret the voting guidelines in an expert capacity and apply them to the proposals

[126] https://www.smolio.ch/wissen/rendite-etf-vs-aktive-fonds/, also https://www.vermoegenszentrum.ch/ratgeber/fachartikel/aktive-passive-fonds-vergleich
[127] SNB (2022b): 90
[128] SNB (2022b): 94

at shareholder meetings. The SNB remains in regular contact with the external service providers and monitors the correct interpretation of the voting guidelines.

The SNB is responsible for its voting decisions, as with its investment policy. The SNB does not publish its actual voting guidelines in order to avoid political pressure and attempts to exercise influence.

8.3.3 Deviations from broad coverage

The National Bank observes fundamental Swiss standards and values when managing securities from private issuers, i.e. it avoids those issuers that breach the standards and values that society broadly identifies with.[129] The SNB bases its value judgements on conventions and international agreements signed by Switzerland. That includes, for example, UN conventions, especially ratified UN international human rights conventions as well as agreements on banned weapons and various environmental themes that are normally also adopted in Swiss legislation. If, for example, the Paris Agreement were to lead to oil heating (existing and new) being banned in Switzerland, the SNB would consider excluding companies producing heating oil from its investment universe.[130] The aim of the SNB's exclusion policy is to exclude those companies from the investment universe that are regarded as particularly irresponsible in any of those fields.

Exclusion policy criteria: standards and values

The National Bank therefore does not buy any securities issued by companies that massively violate fundamental human rights, systematically cause serious environmental damage or are involved in producing internationally banned weapons.[131] Banned weapons are B and C-weapons, cluster munitions and antipersonnel mines. Companies involved in producing nuclear weapons for any countries other than the five nuclear-weapon states in the Treaty on the Non-Proliferation of Nuclear Weapons (China, France, the United Kingdom, Russia and the US) are also banned. Individual companies are excluded under the "systematic severe environmental damage" criterion, if their production processes systematically poison, for example, water or landscapes, cause massive harm to biodiversity or if their business model is mainly based on coalmining.[132] The criterion "massive fundamental human rights violations" serves mainly to exclude companies responsible for serious and/or systematic human rights violations, such as torture, slavery or the violation of fundamental children's rights.

Exclusions based on Swiss standards and values are independent of risk/return considerations. The SNB's exclusions are not aimed effecting a targeted change of the economic structure. It would have no legal mandate to do so.

Box 9

Is it possible to achieve a positive impact on the climate or sustainability by excluding individual companies?

Negative screening is a frequently applied approach in relation to ESG or climate measures in an asset management context, i.e. the exclusion of individual companies from a portfolio. However, a consensus has emerged that a mere exclusion policy is not a suitable means of achieving a verifiable impact on companies or the economic structure.[133] Different conditions must be met to achieve that, e.g. a very high proportion of investors applying the same screening approach, a strong dependency of affected companies on the capital market and a low self-financing level. With the exclusion, however, the investors lose any influence on the excluded company. If investors want

[129] SNB (2022b): 92
[130] The Paris Agreement addresses the states as outlined in chapter 2. It is incumbent on the legislator to work towards the agreed goals through – democratically legitimate – measures in the areas of taxes, duties and regulations
[131] SNB (2022b):92
[132] This criterion is the only one not based directly on a convention. The SNB relies much more on the broad consensus among the Swiss people that energy must not be sourced from coal and that Switzerland should refrain from producing electrical energy from coal
[133] Berk, Jonathan B. and van Binsbergen, Jules H. (2021), similar to Kölbel, Julian et al. (2019)

to influence the business policy of individual companies, direct engagement with the companies, for example the exercise of voting rights, has more of an impact.[134]

A recent study commissioned by the Federal Office for the Environment (FOEN) examined the effectiveness of integrating ESG criteria in investment decisions. The results show that current ESG approaches tend to lead to no, or only minor, sustainable changes.[135]

8.4 Investment risks

The main risks for currency reserves are market risks, especially exchange rate, gold price, equity price and interest rate risks. There are also liquidity risks as well as credit and country risks. However, they are lower than market risks. The contribution of Swiss franc bonds to the overall risk is low.

Foreign exchange reserves make up about 90% of the SNB's balance sheet. Therefore, foreign currency reserve risks and currency risks in particular determine changes in profit or loss at the SNB. Market, liquidity, credit and country risks can have many causes. Examples of significant risks for SNB investments are technological change, cyber-risks, political risks in individual countries, possible energy shortages, pandemics, etc.

Climate risks are part of the risk analysis – exchange rate risks are to the fore

Climate change-induced financial risks are not fundamentally different from other financial risks. That is why they are part of the SNB's risk analysis. Like other financial risks, climate risks can trigger or accentuate market fluctuations and influence the attractiveness of investments. From an investment perspective, they are not fundamentally different to other risks. What all risks have in common is that they can impact the financial stability of countries and/or companies and thus influence the prices of currencies and securities as well as borrowers' ability to pay.

The risks of an appreciation in the Swiss franc pose the biggest threat to the SNB balance sheet.[136] An appreciation of the Swiss franc can weigh significantly on the financial success of the SNB. By way of illustration: in only three of the past 15 years has the franc not risen in value relative to the other investment currencies. This means that the SNB had to absorb exchange rate losses in 12 out of 15 years. This affected the – with the exception of 2018 – consistent investment success measured in local currency. An average appreciation of the franc by 1% against all currencies – a thoroughly plausible scenario – would trigger a loss in the region of CHF 10 bn based on the amount and allocation of foreign exchange reserves at the end of 2021. A (highly improbable) total loss on all SNB investments in the oil and gas industries based on the holding at the end of 2021 would trigger a loss of about CHF 12 billion.

Analysis and steering of balance sheet risks

All material financial investment risks are continually identified by the SNB and assessed in order to optimise their risk/return potential. The risk measurement is based on standard risk indicators and procedures. That includes value-at-risk calculations.[137] Regular sensitivity analyses and stress tests are performed as well. The SNB also applies these analyses to the entire currency reserves (foreign exchange reserves and gold) in order to gain a complete picture of balance sheet risks.

As described in 8.3.1 and 8.3.2, the SNB steers its balance sheet risks so as to ensure the robustness of the balance sheet across different scenarios as much as possible (assumptions regarding future developments). On the asset side of the balance sheet, this is done through broad diversification between different asset classes (equities, bonds, gold, etc.) and within the separate asset categories

[134] E.g. Gianfrate, Gianfranco (2021): 19
[135] https://www.bafu.admin.ch/bafu/en/home/topics/climate/info-specialists/climate-and-financial-markets/investments-impact-risks.html and Heeb, Florian et al. (2022)
[136] SNB (2022b)
[137] The value-at-risk is a key mathematically calculated risk measure for determining the highest expected loss on an investment

(e.g. countries, sectors, bond maturities). Avoidance of risk concentrations is an important part of this exercise. The broad diversification addresses the different risks as well as possible, including the totally unknown ones ("black swans").[138] Opposing developments in different asset classes often lessen the impact of pronounced market movements on specific segments. On the liabilities side of the balance sheet, the SNB aims for sufficient equity to retain a positive capital balance even in the event of highly negative asset performance. The SNB would not lose any room for manoeuvre if it were to temporarily have negative equity, so it could fulfil its monetary policy mandate at any time. Nevertheless, even for a central bank, a long period of negative equity would not be without its problems, as it could undermine the bank's credibility and its independence in the long term. For these reasons, the SNB considers it crucial to maintain a sufficient level of capital. The SNB strengthens its capital by regularly accumulating reserves.

Climate change and risk management

Forward-looking analyses to measure the financial consequences of climate risks, such as scenario analyses and climate-value-at-risk key figures for investment portfolios are not yet commonplace. The difficulty of these approaches lies in the fact that the assumptions about political and climate developments, time horizons and feedback effects[139] come with great uncertainty.

Stress analyses to assess climate risks deliver the most benefit when there are risk concentrations, i.e. when there is concentrated investment in specific sectors or projects over an extended period. In this case, the results can, despite their imprecision, give an indication of the magnitude of potential investment losses. As these measures lack precision, they are less relevant to a diversified portfolio like that of the SNB, which is continually adjusted to market developments. Risk mitigation at the SNB is based primarily on its broad market coverage.

The NGFS scenarios (see chapter 3) can serve as a basis for analyses and climate stress tests. However, they cannot currently be applied directly to a portfolio (e.g. the SNB portfolio). The impact on the individual economic sectors or companies must be modelled individually, as in the SNB and FINMA pilot, for example. The scenarios published by the NGFS are only directly suited to generic, long-term forecasts of economic variables (GDP, inflation, etc.). The NGFS is currently working on refining the estimates with regard to the effects of climate risks on the economy and financial system.

Box 10

Climate stress tests and climate compatibility tests – differences

Climate stress tests and climate compatibility tests are often mixed up in general discussion. A climate stress test assesses the effects of various climate change scenarios on the financial earnings and solvency of a company, bank or central bank. It is therefore based on the risk perspective. With regard to a central bank's balance sheet, for example, the question would arise as to how much its earnings and assets would be impacted if global warming were to be 1.5, 3 or 5°C.

The climate compatibility test, also known as the climate test, evaluates the climatic impact. Investments and financing are considered climate compatible when they are in line with the internationally agreed climate target (Paris Agreement) of keeping global warming well below 2 degrees Celsius.[140] A climate compatibility test involving the SNB would, for example, check whether the operations of companies in its equity portfolio are compatible with the net-zero goal. The climate compatibility test performed in Switzerland by the Federal Office for the Environment (FOEN) and the State Secretariat for International Finance (SIF), is an option for the SNB. The SNB is not currently involved in the test as it would deliver practically nothing that is not already known. The SNB equity portfolio roughly corresponds to the global equity market. The climate compatibility of the global equity index is known. As shown in 8.2 and 8.3, the SNB replicates developments on

[138] Nassim Nicholas Taleb, Professor of risk analysis at the University of New York, terms rare and unforeseeable events with extreme consequences as "black swans", see Taleb, Nassim (2007)
[139] Were tax legislation to change, for example, it would be reasonable to assume that companies will change their behaviour and production processes. These assumptions have a major influence on the results of risk and scenario analyses
[140] https://www.bafu.admin.ch/bafu/en/home/topics/climate/info-specialists/climate-and-financial-markets/pacta.html

the international markets, it does not orient its investment policy to other criteria like climate compatibility. If global market capitalisation shifts to a climate compatible course, the SNB will automatically replicate this in its investment portfolio.

However, the new provisions on joint-stock companies relating to transparency over non-financial matters[141] could oblige the SNB to bring changes to its reporting, as company law applies to it subsidiarily.

8.5 Responsibilities in the investment and risk control process

The responsibilities for asset management are set out in the National Bank Act.[142] The Governing Board defines the investment policy principles, covering the balance sheet structure, investment goals, definition of the investment universe, requirements of the investment strategy and the associated risk tolerance, as well as shaping the investment and risk control process. The Governing Board specifies in particular the requirements in terms of the security, liquidity and return on investments and decides on eligible currencies, asset classes, investment instruments and borrower categories. It defines the composition of the currency reserves and other assets, and decides on the investment strategy for the foreign currency investments.

The Bank Council is responsible for the overall supervision of the investment and risk control process. It assesses the principles of the process and monitors compliance with them. It is supported by a risk committee comprising three members of the Bank Council. This committee monitors in particular the risk management and evaluates the good management of the investment process.

Box 11

An ethics committee would be a foreign body in the investment process

One criticism with regard to the exclusion criteria is that the SNB defines them at its own discretion. Critics argue that the decisions should be taken by an ethics committee.[143]

As with its equity investments, the main arguments against such a committee are of a regulatory nature. The members of the ethics committee – wherever they may come from (politics, economy, civil society etc.) – would quickly come to represent political interests and this would influence the SNB's asset management as the exclusions would be motivated by particular interests. This would not only place the investment portfolio at risk of deviating from monetary policy requirements, but would also politicise investment policy.

8.6 Conclusion

The SNB has been given a mandate focusing narrowly on monetary policy; therein lies the sole basis of its independence. Its asset management is also subordinate to the primacy of monetary policy. The SNB has no mandate to directly pursue structural policy through its investments and, for example, buy or sell heavily in specific sectors in order to support or move against industrial sectors as a means of influencing climate change. The SNB proceeds cautiously for regulatory reasons when excluding companies from its investment portfolio and such a decision is based on recognised Swiss standards and values.

[141] Federal Council (2022)
[142] SNB (2022b): 86 et seq.
[143] Hurni Baptiste motion (20.3619), rejected in the National Council on 8 June 2022 by 116 votes to 64 with 3 abstentions

For monetary policy reasons, especially the ability to extend or reduce the balance sheet at any time and ensure the value of the reserves, the SNB prioritises neutrality and diversification in its investment approach. This means considering all risks, including climate risks, for its asset management. Climate risks are not fundamentally different from other risk categories, for example market, credit or liquidity risks.

9 Operational sustainability impacts of the SNB

Its annual Sustainability Report, the SNB outlines which priorities it is pursuing with regard to operational environmental and social issues, as well as contributions to society.[144] The specialist unit for sustainability created in 2021 produces the Sustainability Report and supports various projects (e.g. alignment with international reporting standards, eco-performance assessments). This chapter is based on the Sustainability Report, which covers social aspects of the SNB as well as environmental aspects.

Social aspects of the SNB

The SNB regularly conducts equal pay analyses. In 2021, the analysis was based on the Federal Act on Gender Equality. The results in 2021 were within the 5% tolerance threshold set by the Confederation. The SNB also has a certified reporting system for breaches of the rules as well as a diversity strategy. This includes measures on three levels: firstly, guaranteeing equality of opportunity and non-discrimination; secondly, dismantling structural and cultural barriers (e.g. by adapting employment or operating conditions), thirdly, underrepresented groups must be promoted in a targeted and differentiated way via additional measures. Internal diversity controlling and regular participation in benchmarking are intended to measure development with regard to diversity and inclusion over time. The diversity strategy also includes measures to promote women in all positions where they are underrepresented.

Just under one-third of SNB employees are currently women. The proportion of women in senior management positions has increased by 4.6 percentage points since 2010, and at the end of 2021 stood at 17.7%. This proportion is highest in economic fields and in management support functions, and significantly lower in the case of IT and security. All areas and language regions are represented among the SNB's Swiss staff. 84.2% are from German-speaking Switzerland, 6.7% from the French-speaking part of the country and 3.5% from the Italian-speaking part.

Operational environmental performance

In its Charter, the SNB undertakes to be careful in its use of natural resources. The SNB has been implementing environmental initiatives since 1989. In the first years, these measures were primarily geared to improving the energy performance of its buildings. In 1996, it introduced a systematic approach to environmental management, highlighting areas for improvement.

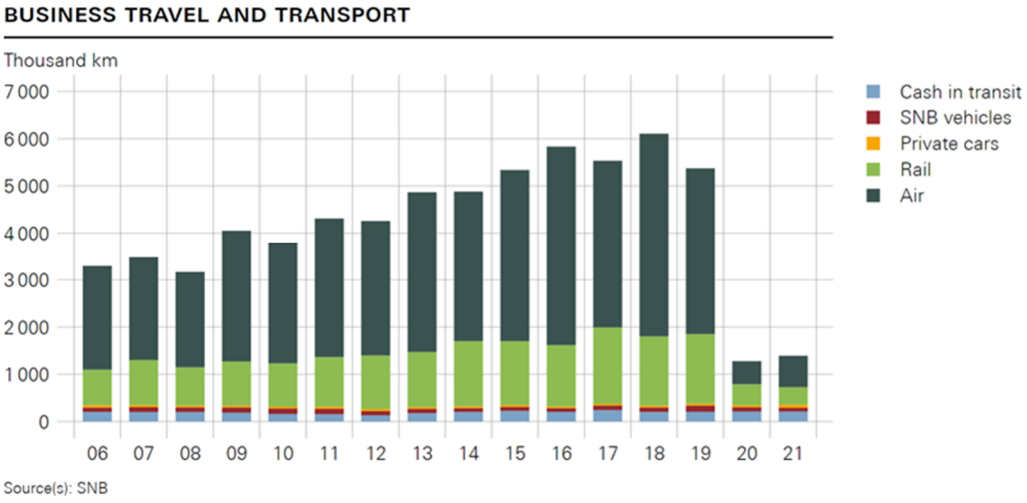
The SNB's calculation and reporting of operational environmental performance indicators are based on the indicators published by the German association for environmental management and sustainability in financial institutions (VfU). The SNB keeps annual records of electricity consumption, heating energy, business travel and transport, paper consumption, water consumption and waste. Operational environmental performance indicators improved markedly in the past two years due to the COVID-19 pandemic.

The SNB has stabilised electricity consumption per employee over the longer term. This is in spite of the IT servers using more electricity. The decline in the past two years is due to a large extent to people working from home. The trend of heating energy consumption, including relative to employees, fell consistently until 2018. In the past three years, however, it has gone up again. This increase is mainly due to the higher number of heating degree days (harsher winters). In addition, energy consumption for heating increased in the past two years, as fewer internal energy consumers (computers, printers, people) were in the offices. The SNB has made progress with regard to paper consumption per employee. The transition to a paperless office seems to have worked. The latest fall in paper consumption in 2021 and 2022 resulted from the pandemic to a large extent. The biggest pandemic-induced change was in travel by SNB staff. Flights and railway journeys fell markedly.

[144] SNB (2022c)

The SNB's business travel and transport covers both travel by employees for business purposes and cash in transit. Owing to travel restrictions in connection with the COVID-19 pandemic, travel remained at a lower level, although it did increase by 8.6% versus 2020 to 1.4 million km; this corresponds to an increase per employee of 9.1% to about 1,560 km. Air travel was up 36% versus 2020, mainly because of an increase in the number of flights between Switzerland and Singapore resulting from changes in personnel at the SNB's branch office. Rail travel declined again by 17%. The number of kilometres travelled in SNB vehicles and private cars for business purposes increased, while the corresponding figure for cash in transit remained stable. The SNB has no set requirements regarding delegation sizes for business trips. The delegation heads can shape the delegations according to their needs. They must, however, follow the SNB's Charter, which requires them to use resources sparingly. The SNB has defined clear criteria in its travel and expenses regulations about authorised flight durations and which class of flight is allowed.

Figure 4 Development of business travel and transport at the SNB



Source: SNB (2022c), p.33

Climate protection

The SNB sets itself operational climate-related goals. It has defined climate protection goals for the 2016–2025 period in the areas of electricity consumption from renewable energy, business travel and transport, and greenhouse gas emissions (see Table Table 2).[145] The SNB conducts an annual review of its performance in achieving its targets compared to the reference year of 2016.

[145] In its operational activities, the SNB's direct greenhouse gas emissions result from heat generated using fuel, cash in transit, and work-related employee travel in SNB vehicles. Indirect emissions are generated in the production of electricity and district heating at the respective suppliers. Other indirect emissions arise from the upstream and downstream stages involved in biogas production, paper manufacturing, water treatment, rail transport, flights, waste disposal, and employee use of private cars for business purposes (SNB Sustainability Report 2021: 39)

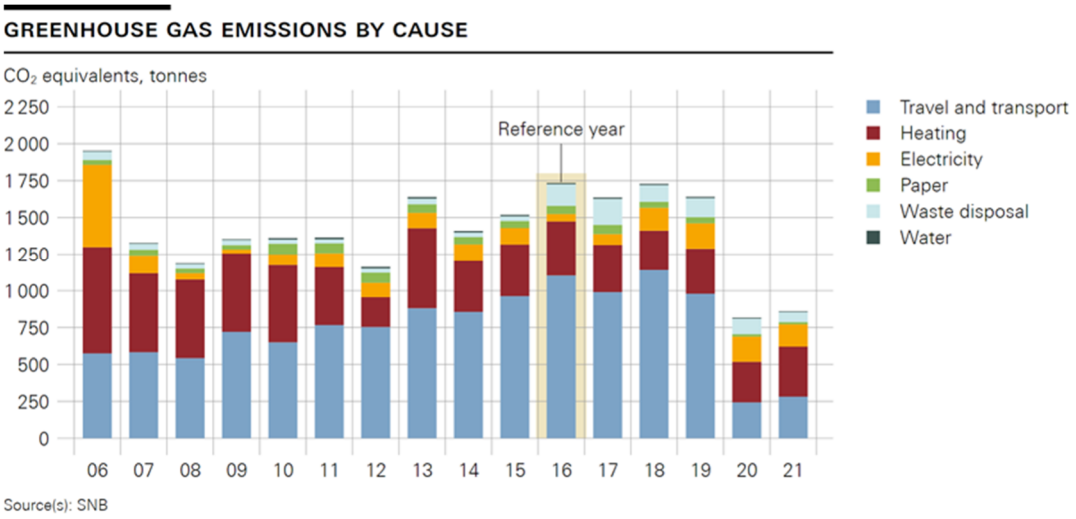
Table 2 Environmental goals for climate protection 2016-2025 and progress towards targets

	Target by 2025	Status 2021	Status 2019	Reference year 2016	Change by 2021 in %	Change by 2019 in %
1. The SNB will continue to meet 100% of its electricity consumption with renewable energy (%)	100	100	100	100	-	
2. The SNB intends to produce at least 1% of electricity from its own photovoltaic installations (%)	1	0	0	0	-	
3. Business travel and transport per employee will be stabilised, and reduced if possible (km)	7,153	1,561	6,146	7,153	-78,2	-11.6
4. GHG emissions per employee will be lowered by 10% (CO_2 equivalents, kg)	1,913	968	1,880	2,126	-54,5	-14.1
5. Residual, unavoidable GHG emissions will continue to be offset in full (%)	100	100		100	-	

Source: SNB sustainability report 2021, p.37

The COVID-19 pandemic and resulting high proportion of employees working from home also had a major impact on the operational greenhouse gas (GHG) emissions of the SNB over the past two years. They are lower, mainly due to the lower energy consumption in the offices and the lower number of business trips. The next few years will show whether the SNB will achieve its operational environmental targets by 2025 (see Table 2 and Figure 5).

Figure 5: Changes in the SNB's operational GHG emissions



Source: SNB (2022c) page 40: 2016 is the reference year for the climate protection goals

The SNB's strategy of cutting GHG emissions and thereby protecting the climate comprises four levels: first avoidance, then reduction, then using low-emission alternatives, and finally, offsetting.

- At level 1, avoidance, the energy consumption of the technical installations and their settings are regularly checked, with adjustments and optimisations carried out as required. Furthermore, efforts are made to encourage environmentally conscious behaviour among employees.
- In order to reduce GHG emissions, a key consideration in any capital spending is cutting the consumption of resources and improving energy efficiency. During renovations, technical and structural measures, such as lake-water cooling, are implemented.

- Renewable energy is used as an alternative to fossil natural gas. For example, since 2018 the SNB has covered its entire gas requirements at its Zurich premises with biogas generated at regional biogas plants from organic material such as green waste and food waste. Since 2009, the SNB has exclusively used electricity from renewable sources at its locations.
- Since 2011, the SNB's operational processes have been carbon neutral, with residual, unavoidable operational GHG emissions offset with certificates from high-quality climate protection projects.

Box 12

Why is the SNB not participating in the "Exemplary Energy and Climate" initiative?
The federal "Exemplary Energy and Climate" initiative is one of twelve measures in the Energy Strategy 2050 and is aimed at the main Swiss providers of publicly relevant services. By signing the declaration of intent, they commit to an ambitious contribution to operational climate protection by increasing energy efficiency and expanding the use of renewable energy in Switzerland.[146]
The SNB shares the ambition of being an innovative and exemplary player in the field of energy. The operational measures implemented by the SNB since 1989 have continually improved its energy efficiency and significantly reduced its harmful emissions. For some years now, the SNB has been in regular contact with the VfU network, which is made up of several hundred users mainly from the financial services sector, about the development and measurement of environmental performance. This sector-specific initiative is the most suitable reference framework for the SNB, as it offers the best comparators in operational terms. A commitment to another programme, particularly one with entities operating on an entirely different basis due to the nature of their business (e.g. Swiss Post, SBB, RUAG AG, Zurich Airport) therefore does not add anything for the SNB.

Conclusion

Through its operations, the SNB supports the achievement of various goals formulated by the Federal Council in its "2030 Sustainable Development Strategy". The SNB contributes to the reduction of GHG emissions and promotion of renewable energies through its measures and targets in the area of operational environmental management.

[146] https://www.vorbild-energie-klima.admin.ch/vbe/en/home.html

10 Conclusion

The legal mandate sets the framework within which the SNB addresses sustainability issues in performing its tasks. The SNB mandate derived from the constitution and National Bank Act is "to ensure price stability, while taking due account of economic developments". Stable prices are indispensable to economic growth and prosperity. In fulfilling its mandate, the SNB helps the government and Parliament to pursue social and environmental goals such as Switzerland's sustainability goals. The SNB has no mandate to pursue other (economic) policies or other social goals of the Federal Council or Parliament, including the country's sustainability goals.

The strict orientation to the monetary policy mandate also means that the SNB takes account of sustainability aspects in performing its tasks. The SNB has to account for climate, environmental and other sustainability aspects as part of its mandate, to the extent that they affect price and financial stability or contain financial risks for the SNB. It does take account of these criteria in a number of areas, specifically monetary policy analysis, its responsibility for financial stability and asset management.

The report clarifies that it is important for the SNB in fulfilling its mandate to understand how climate risks impact the functioning of the economy and the resulting consequences for price and financial stability. The SNB does take this into account in its monetary policy analysis by continually refining its methods of analysis and forecasting models and adapting them to changing conditions. With regard to financial stability, the SNB analyses climate-related risks and identifies any need for action. It publishes the relevant analyses and evaluations in its annual Financial Stability Report in order to raise awareness of the issue in the banking sector and among the public. The SNB – in cooperation with FINMA and the FDF – also contributes to shaping the regulatory operating conditions for the financial sector with regard to the climate. The effects of climate change and the associated measures are also relevant to the SNB's asset management. For monetary policy reasons and especially the need to be able to expand or reduce the balance sheet at any time, and to ensure the value of the reserves, the SNB keeps its investments as liquid and diversified as possible. In doing so, the SNB ensures that its investment portfolio mirrors the structural changes of the economy in response to climate risks.

Calls for the SNB to orient its monetary policy towards climate or environmental policy goals are incompatible with its mandate. This would invariably lead to a conflict between the mandate of price stability and climate and environmental policy measures. The SNB can best help the government and Parliament to implement Switzerland's sustainability goals by pursuing a stability-oriented monetary policy. Monetary policy instruments, such as interest rate and exchange rate policy, are not an appropriate way to achieve climate and environmental policy objectives. Moreover, aligning monetary policy instruments to these goals would conflict with the SNB's own mandate. It is up to the elected government and Parliament to take structural policy measures, as only they have that authority and the proper instruments. The same applies to asset management at the SNB, which is determined by monetary policy requirements. The SNB, on the other hand, has no mandate to use its assets for structural policy, for example by initiating major purchases or sales in support of specific industrial sectors. For the public policy reasons cited above, the SNB only deviates within a relatively narrow frame of reference from the broad market coverage outlined in this report, and only excludes companies from its investment portfolio if they are in breach of broadly recognised standards and values in Switzerland.

A certain room for manoeuvre may arise in the context of the SNB's mandate or performance of its tasks (conducting monetary policy in the general interest of the country, ensuring price stability while taking account of economic developments). Owing to its constitutionally guaranteed independence, it is up to the SNB to decide whether such scope exists and how it should be used. However, the SNB's actions may not be motivated by any party-political goals or vested interests.

The legislator deliberately limited the SNB's mandate to ensuring price stability while taking due account of economic developments. This justifies the SNB's independence and avoids conflicting goals. The Federal Council continues to view the clear division of tasks and responsibilities between the SNB, Federal Council and Parliament as a public policy necessity.

The SNB conducts climate research, contributes to national and international expert debates, participates in working groups and raises public awareness of the issue through its regular publications as well as in speeches and interviews, in order to improve the understanding of climate change and how it impacts the economy and price and financial stability in particular. The SNB also addresses different aspects of climate and the environment in its training programme. The National Bank documents the fulfilment of its Charter and operational goals with regard to sustainability in its annual Sustainability Report.

11 Text of the postulate

20.3012 Postulate of the Economic Affairs and Taxation Committee of the NC Sustainability goals for the Swiss National Bank

Wording of the postulate of 24.02.2020

The Federal Council has the mandate to prepare a report and demonstrate how the National Bank can support the Confederation in achieving its sustainability goals and which proactive role it can assume in coordinating climate measures in the financial sector.

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List of abbreviations

FOEN	Federal Office for the Environment
BCBS	Basel Committee on Banking Supervision
GDP	Gross domestic product
BIS	Bank for International Settlements
CSPP	Corporate Sector Purchase Programme
CSRD	Corporate Sustainability Reporting Directive
FDF	Federal Department of Finance
EU	European Union
ESG	Environment, Social, Governance
ECB	European Central Bank
Fed	Federal Reserve
FINMA	Financial Market Supervisory Authority
FSB	Financial Stability Board
IAM	Integrated assessment modelling
IPCC	Intergovernmental Panel on Climate Change
CPI	National Consumer Price Index
NGFS	Network for Greening the Financial System
IMF	International Monetary Fund
NiGEM	National Institute's Global Econometric Model
SBB	Swiss Federal Railways
SNB	Swiss National Bank
SDG	Sustainable Development Goals
2030 SDS	2030 Sustainable Development Strategy
SR	Classified Compilation of Federal Legislation
TCFD	Task Force on Climate-Related Financial Disclosures
UN	United Nations
VfU	Association for environmental management and sustainability in financial institutions (Verein für Umweltmanagement und Nachhaltigkeit in Finanzinstituten e.V.)
EATC -N	National Council Economic Affairs and Taxation Committee