4. Tracking Country Progress

4.1 The Paris Agreement

4.1.1 Country statement of commitment to the agreement

In 2017, the Swedish parliament (the Riksdag) introduced a climate policy framework together with a climate act for Sweden, a framework which is the most important climate reform in the country's history.[1] The framework contains: 1) climate goals together with; 2) a climate act; and 3) plans for a Climate Policy Council, and sets out the country's implementation of the Paris Agreement, being a key component of Sweden's efforts to comply with the Agreement. The aim of the policy framework is to create a coherent climate policy for Sweden in order to ensure the long-term conditions needed to implement the climate goals and contribute to the desired temperature as set out in the Paris Agreement.[2]

The introduction of the climate policy also means that it is the first time that Sweden will have an act under which each government will have an obligation to pursue a climate policy based on climate goals adopted by the Riksdag, and under which each government is obliged to provide reports on how their achievement of the goals is progressing.[3] Policies and efforts towards the goals will be reviewed by an independent Climate Policy Council.

The climate act contains several ambitious climate goals for Sweden:[4]

- By 2045, Sweden is to have *zero net emissions* of greenhouse gases into the atmosphere, thereafter achieving negative emissions. Emissions originating from within the borders of Sweden are to be at least 85 percent lower than the country's net emissions in 1990. Converted into absolute numbers, this means that Sweden's goal is to have net emissions equalling less than one ton per person by 2045.
- By 2030, emissions from domestic transport (excluding domestic aviation, which is included in the European Union Emissions Trading System instead), should be reduced by at least 70 percent as compared with 2010.
- By 2030, emissions in sectors covered by the EU Effort Sharing Regulation (i.e. road transport, heating of buildings, agriculture, small industrial installations, and waste management[5]) should be at least 63 per cent lower than in 1990
- By 2040, emissions in sectors covered by the EU Effort Sharing Regulation should be at least 75 per cent lower than in 1990.

In addition to its own climate policy framework, Sweden is also part of the EU, which means that it is part of the joint EU climate plan and stands behind the goals as formulated in this plan.[6] The current goal in this climate plan is that net emissions of greenhouse gasses will decrease by 40 percent by 2030

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1 Ministry of the Environment and Energy. *The Swedish Climate Policy Framework*. Retrieved from https://www.government.se/495f60/contentassets/883ae8e123bc4e42aa8d59296ebe0478/the-swedish-climate-policy-framework.pdf [retrieved 2021.11.30]. p. 2.

2 The Swedish Environmental Protection Agency. *Hur Bidrar Sverige till Parisavtalet?* Retrieved from https://www.naturvardsverket.se/amnesomraden/klimatomstallningen/det-globala-klimatarbetet/parisavtalet/hur-bidrar-sverige-till-parisavtalet/ [retrieved 2021.11.30]

3 Ministry of the Environment and Energy. *The Swedish Climate Policy Framework*. Retrieved from https://www.government.se/495f60/contentassets/883ae8e123bc4e42aa8d59296ebe0478/the-swedish-climate-policy-framework.pdf [retrieved 2021.11.30]. p. 2.

4 Ministry of the Environment and Energy. *The Swedish Climate Policy Framework*. Retrieved from https://www.government.se/495f60/contentassets/883ae8e123bc4e42aa8d59296ebe0478/the-swedish-climate-policy-framework.pdf [retrieved 2021.11.30]. p. 3-4.

5 The European Commission (14 July 2021). *Questions and Answers – The Effort Sharing Regulation and Land, Forestry and Agriculture Regulation*. Retrieved from https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3543 [retrieved 2021.11.30]

6 The Swedish Environmental Protection Agency. *Hur Bidrar Sverige till Parisavtalet?* Retrieved from https://www.naturvardsverket.se/amnesomraden/klimatomstallningen/det-globala-klimatarbetet/parisavtalet/hur-bidrar-sverige-till-parisavtalet/ [retrieved 2021.11.30]

as compared to 1990, although it was proposed in September 2020 that this target should be increased to 55 percent.[7]

Another key part of the Paris Agreement is that affluent countries ought to support developing countries in their efforts towards decreasing net emissions by means of monetary aid.[8] Sweden has a long tradition of providing this type of aid to developing countries and is, for instance, per capita one of the largest donors to the UN Green Climate Fund.

4.1.2 Institutional structure/mechanisms responsible for implementing the Paris Agreement

As established in the country's Climate Act, the Swedish Government (Regeringen) is obliged to present a climate report every year in its Budget Bill, and every fourth year the Swedish Government is required to draw up a renewed climate policy action plan which sets out how the climate goals are to be achieved.[9] The key point of the climate report is to facilitate the monitoring and evaluation of the combined climate effects of all policy areas, therefore the report must contain a description of emission trends in relation to the climate goals.[10] The report also describes the most important decisions made during the year and the effects of these decisions on the development of reducing greenhouse gas emissions. Moreover, it has to contain an evaluation of whether there is a need for further measures. The climate policy action plan shows how the Swedish Government's combined policies contribute to achieving the milestone targets laid out above.[11] If the Swedish Government finds that the decided targets cannot be achieved with current policy instruments, this action plan must account for the reasons why, and what additional measures the Swedish Government intends to take in other areas to achieve the goals. In support of the climate policy action plan presented every fourth year, the Swedish Environmental Protection Agency supports the government with data and analysis.[12]

In addition to the responsibilities of the Swedish Government, the Climate Act establishes a Climate Policy Council, which is tasked with supporting the government in achieving the climate goals. The Climate Policy Council has to submit a report to the Swedish Government each year, containing: 1) an assessment of how climate efforts and trends in emissions are progressing; 2) an assessment of whether the Swedish Government's policy is compatible with the climate goals; and 3) other analyses and assessments conducted by the Council.[13] The terms of reference of this climate council includes: [14]

- Evaluating whether the focus of the Government's different relevant policy areas contributes to, or counteracts the potential to achieve the climate goals.
- Highlighting the effects of agreed and proposed instruments from a broad societal perspective.
- Identifying policy areas which require further action.

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7 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 4.

8 The Swedish Environmental Protection Agency. *Hur Bidrar Sverige till Parisavtalet?* Retrieved from https://www.naturvardsverket.se/amnesomraden/klimatomstallningen/det-globala-klimatarbetet/parisavtalet/hur-bidrar-sverige-till-parisavtalet/ [retrieved 2021.11.30]

9 Ministry of the Environment and Energy. *The Swedish Climate Policy Framework.* Retrieved from https://www.government.se/495f60/contentassets/883ae8e123bc4e42aa8d59296ebe0478/the-swedish-climate-policy-framework.pdf [retrieved 2021.11.30]. p. 2-3.

10 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 12.

11 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 13.

12 The Swedish Environmental Protection Agency. *Sweden's Climate Act and Climate Policy Framework.* Retrieved from https://www.naturvardsverket.se/en/topics/climate-transition/sveriges-klimatarbete/swedens-climate-act-and-climate-policy-framework/ [retrieved 2021.11.30]

13 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 13.

14 The Swedish Climate Policy Council. *Our Mission.* Retrieved from https://www.klimatpolitiskaradet.se/en/uppdrag/ [retrieved 2021.11.30]

- Analysing what it takes to achieve targets, both in the short- and in the long-term, in a cost-effective way.
- Evaluating the bases and models upon which the Government builds its policy.
- Fostering more debate in society on climate policy.

In accordance with article 4.19 of the Paris Agreement, Sweden has furthermore submitted a Long-Term Strategy for Reducing Greenhouse Gas Emissions, a document which both constitutes Sweden's reporting on national long-term objectives for territorial emissions, and which lays out existing targets, policy instruments and actions decided on in order to work on decreasing emissions in line with the Paris Agreement.[15] This strategy is largely based on the climate policy framework and Government Bill described above. The strategy states that Sweden uses a number of national and EU-wide policy measures to achieve its national climate goals, instruments which may be divided into four main categories:[16]

- *Economic measures*, such as energy and carbon taxes, emissions trading and grants such as the Climate Leap and subsidies to low emission vehicles.
- *Administrative measures*, such as the reduction obligation, the Planning and Building Act and requirements on carbon dioxide emissions from new vehicles.
- *Informative measures*, for example energy and climate advice.
- And *research and market launches*, such as support for research programs and the Industry Leap's industrial green investment grants program.

In addition to carbon/energy taxes and the EU Emissions Trading System, which includes approximately 760 facilities, two main cross-sectoral initiatives or mechanisms exist with the mutual aim of enhancing Sweden's climate efforts: *Fossil Free Sweden* and *The Climate Leap.*[17] The Fossil Free Sweden initiative brings together more than 400 actors which have signed a declaration in which they undertake to demonstrate tangible measures to mitigate emissions, and is an important platform for dialogue and cooperation between actors for a competitive climate transition. The Climate Leap on the other hand is made up of a government co-funding program for local climate investments in an effort to further encourage cuts in greenhouse gas emissions and covers all sectors and all types of organisations.

While these are national and cross-sectoral mechanisms in place to support Sweden's efforts in line with the Paris Agreement, much work is done on a regional or municipal level, and in particular with regards to coastal areas and the built environment. *County Administrative Boards* coordinate regional climate and energy initiatives and support regional actors in these endeavours.[18] These are key to the development of the built environment, in that they are involved in local regional spatial planning, regional development and growth policy, as well as infrastructure planning. Climate and energy strategies are thus in many cases shaped regionally, with regional and local actors working together to foster effective measures and find synergies.

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15 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 3

16 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 35.

17 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 38-39

18 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 42.

4.1.3 National Statement on progress in implementing the Paris Agreement

The Swedish Climate Policy Council issued its latest yearly report on the Government's climate policy and emission trends in March 2021. Key takeaways from the report show that:[19]

- The latest official statistics on greenhouse gas emissions in Sweden from 2019 show that the reduction in emissions that year were 2.4 per cent. This is a slight increase from previous years, but not close to the 6-10 per cent per year needed to reach Sweden's goals by 2045.
- The 2020 interim goal of reducing emissions outside the EU Emissions Trading Scheme by 40 per cent was achieved
- Greenhouse gas emissions in Sweden decreased temporarily during 2020, much as a cause of the ongoing pandemic, but this decrease will only have a marginal effect on Sweden's opportunities to achieve its climate goals and contribution to the Paris Agreement goals.

The Swedish Long-Term Strategy for Reducing greenhouse Gas Emissions seconds these takeaways, stating that territorial emissions in Sweden have been reduced over time but in too slow a manner, and that "additional measures are needed if Sweden is to be able to live up to the commitments made in the Paris Agreement, to reach its national emission targets and to attain the Government's ambition of becoming the world's first fossil-free welfare nation".[20] Scenarios indicate that with current policy instruments, greenhouse gas emissions will fall before stabilising after 2030, and that in 2050, emissions are estimated to be around 36 per cent below 1990 levels, falling short of the envisioned 85 per cent.[21]

4.1.4 Specifics of the Paris Agreement and the built environment

As mentioned in section 4.1.1, Sweden's commitment to the Paris Agreement includes a 2030 target for emissions in sectors covered by the EU Effort Sharing Regulation, some of which pertain to the built environment, such as road transport and heating of buildings. Putting the baseline year at 1990, the goal is to achieve a 63 per cent decrease in 2030 and a 75 per cent decrease in 2040 for emissions stemming from these sectors.

The Swedish Long-Term Strategy for Reducing Greenhouse Gas Emissions lays out existing targets, policies, and actions decided upon for reducing greenhouse gas emissions in line with the Paris Agreement and national climate goals, some of which are touching upon the built environment:

- Under the headline *transport-efficient society*, a number of initiatives relevant to the built environment have been forwarded:[22]
    - *Urban environment agreements* is a program for investment in public transport, cycling infrastructure and sustainable goods transport solutions in urban environments, aiding municipalities in the strife for greater long-term stability in urban environments and transport systems.
    - In 2018, a new national plan for transport infrastructure was issued, with the responsibility for implementing this plan lying with the Swedish Transport Administration.
    - Demonstration projects for electric roads have been initiated by the Swedish Transport Administration, aiming to improve the efficiency of goods transport and cut greenhouse gas

[19] The Swedish Climate Policy Council. *Report 2021.* Retrieved from https://www.klimatpolitiskaradet.se/en/rapport-2021/ [retrieved 2021.11.30]

[20] Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 7.

[21] Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 24.

[22] Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 47-48.

emissions. Facilitating these endeavours, the Swedish Government intends to produce a long-term plan for building and expanding electrified roads.

- Within action area *electricity and district heating,* certain land and water areas have since 2004 been designated areas of national interest for wind power, coupled with funding for municipalities to build wind farms.[23] Likewise, subsidies for installing solar panels for all types of actors exist.

4.1.5 Carbon emissions and the building industry – policy and action

Two pieces of legislation in particular concern the built environment: *the Environmental Code*[24] and *the Planning and Building Act*[25]. Although the Environmental Code has promotion of sustainable development as its overarching goal and includes general rules on taking the environment into account, permit application procedures as laid out in the Code also include assessments of greenhouse gas emissions for facilities. Similarly, the Planning and Building Act requires that environmental and climate aspects are taken into consideration in the planning of the built environment. These pieces of legislation can therefore be said to be in support of Swedish efforts to live up to the goals in the Paris Agreement.

4.1.6 Opportunities and constraints of implementing the Paris Agreement

The Swedish Long-Term Strategy for Reducing Greenhouse Gas Emissions highlights three main consequences of Swedish policy to attain the climate goals, consequences which may be seen as constraints of implementing the Paris Agreement given that the strategy is a key cornerstone in the country's commitment towards the agreement:

- *The costs of transition are estimated to be small but uncertain:* The total costs for Sweden associated with reaching the goal of net zero emissions by 2045 are by today's models estimated to be minor, but there are considerable uncertainties in forecasts reaching over 25 years in the future due to for instance large uncertainties in many modelling assumptions such as discounting rates, economic growth, behavioural change or technical development.[26]
- *Synergies and conflicts with other environmental and societal goals:* Side effects of synergies and conflicts between goals and policies are difficult to quantify but may be very significant.[27] The net impact of these will therefore depend on how policy is pursued in practice, and the rate and size of the change.
- *Risks and opportunities of the transition for industry:* [28] The Strategy mentions that if policy instruments are unilaterally introduced in Sweden there is for instance a risk of job losses in certain sectors, which in turn may generate a risk of carbon leakage. It is mentioned that investment risks have to be shared between the business community and the Swedish Government, as major technological leaps are needed to enable the transition to net zero emissions. Furthermore, another possible constraint is the degree of flexibility with which climate policies are designed, as policies have to be flexible enough to be adapted to prevailing circumstances.

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23 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 60.

24 SFS 1998:808

25 SFS 2010:900

26 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 80.

27 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 81.

28 Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 81-82.

From an opportunity point of view, Sweden is advantaged in the transition to net zero emissions as it has an almost fossil-free electricity and district heating production, biomass, water, and wind resources.[29] In addition, a set of social factors facilitate the transition such as high climate awareness among the population, a high trust in institutions and a long history of innovation and entrepreneurship.[30]

[29] Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 82.

[30] Swedish Ministry of the Environment (December 2020). *Sweden's Long-Term Strategy for Reducing greenhouse Gas Emissions.* Retrieved from https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf [retrieved 2021.11.30]. p. 82.

4.2 The Sustainable Development Goals

4.2.1 Country statement of commitment to the SDGs

Sweden is a leading actor in the work to achieve the SDGs[31]. Nationally, the government implemented the 'Action plan Agenda 2030 2018-2020'[32] to focus the approach for how to work with the SDGs within six thematic areas, and four key factors. The most recent commitment from the government was established in 2021 in the report 'Sveriges genomförande av Agenda 2030 för hållbar utveckling'[33] (loosely translated to: Sweden's implementation of Agenda 2030 for sustainable development). The introduction of this report emphasises the interconnectedness of all goals, targets, and indicators, further establishing that the link between the three sustainability dimensions economic, social, and environmental are inseparable.[34]

The SDGs are followed up on a national level by Statistics Sweden (Statistiska Centralbyrån (SCB), where around 50 nationally adapted indicators are added to the 230 indicators decided upon globally.[35] The SCB reports on 151 of the total 292 indicators applicable to Sweden. Forty five out of the indicators reported by the SCB are national indicators applicable only to Sweden, and which function as a complement to the global indicators. Two of the indicators are proxy-indicators which replace global indicators, measuring approximately the same thing as the global indicators but based on statistics available for Sweden. Statistics Sweden moreover produces a national list of indicators on a yearly basis as assigned by the Swedish Government. The indicators in this list may be updated in collaboration with authorities responsible for indicators.[36]

4.2.2 Reflections on Goal 9 – nationally and in coastal zones if applicable with a focus on Opportunities and constraints of meeting the goal's targets

Goal 9 in the SDGs has targets that track sustainable industries, sustainable innovations, and inclusive infrastructure. In Sweden, the targets are tracked by Statistics Sweden, except for 9.3, making access to financial services and markets easier, and 9.b Support diversification and technical development in domestic industry. Although, they will feature in upcoming reports[37]. National progress towards the targets is summarized below:

- Target 9.1 Sustainable, resilient, and inclusive infrastructure:
  - *Indicator 9.1.1 Proportion of the rural population who live within 2 km of an all-season road:* Not applicable to Sweden.

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31 Regeringskansliet. Sveriges genomförande av Agenda 2030 för hållbar utveckling. Retrieved from https://www.riksdagen.se/sv/dokument-lagar/arende/betankande/sveriges-genomforande-av-agenda-2030_H801FiU28 [retrieved 2022.02.02]. P.8

32 Regeringskansliet. Handlingsplan Agenda 2030 2018-2020. Retrieved from https://www.regeringen.se/49e20a/contentassets/60a67ba0ec8a4f27b04cc4098fa6f9fa/handlingsplan-agenda-2030.pdf [retrieved 2022.02.02].

33 Regeringskansliet. Sveriges genomförande av Agenda 2030 för hållbar utveckling. Retrieved from https://www.riksdagen.se/sv/dokument-lagar/arende/betankande/sveriges-genomforande-av-agenda-2030_H801FiU28 [retrieved 2022.02.03]. pp.6-7

34 Regeringskansliet. Sveriges genomförande av Agenda 2030 för hållbar utveckling. Retrieved from https://www.riksdagen.se/sv/dokument-lagar/arende/betankande/sveriges-genomforande-av-agenda-2030_H801FiU28 [retrieved 2022.02.03]. P.6

35 Statistics Sweden. *Agenda 2030.* Retrieved from https://www.scb.se/hitta-statistik/temaomraden/agenda-2030/ [retrieved 2021.12.06]

36 See for instance the list of indicators applicable for 2021: Statistics Sweden. *Nationell indikatorlista 2021.* Retrieved from https://scb.se/contentassets/0dc69a7282e74c75bf8b040ee3185fe3/nationell-indikatorlista-2021.pdf [retrieved 2021.12.06]

37 Statistics Sweden. *Mål 9 – Hållbara städer och samhällen.* Retrieved from https://scb.se/hitta-statistik/temaomraden/agenda-2030/mal-9/?showAllContentLinks=True [retrieved 2022.02.01]

- *Indicator 9.1.2 Passenger and freight volumes, by mode of transport:* Most relevant for this project is that the volume of passengers, and cargo, has slowly but steadily increased between 2015-2019 on sea and lakes.
- *Indicator 9.1.3 Proportion of population with easy access to public transport* (this is only a nationally measured statistic that is aimed at supporting the global statistics[38]): In urban areas approximately 90 % of the population has access to public transport. This includes ferry transportation, both for cars and for people, in several coastal areas, for example in Stockholm or Karlskrona.

- Target 9.2 Inclusive and sustainable industrialization:
  - *Indicator 9.2.1 Manufacturing value added as a proportion of GDP and per capita*: The manufacturing sectors value has in absolute numbers increased since 2012, but has decreased as proportion of GDP, from 13.9% in 2012, to 13,0% in 2019.
  - *Indicator 9.2.2 Employment in the manufacturing sector as part of total employment:* 5% of women, and 14% of men are employed in the manufacturing sector, although on a downward going trend since 2006, when 21% of men, and about 7% of women were employed in this sector.
- Target 9.4 Upgrade and retrofit industry and infrastructure to become more sustainable:
  - *Indicator 9.4.1 Co2 emissions per unit of value added:* Sweden has since 2008 reduced their Co2 emissions per value added from 17% to just under 12% in 2018.
  - *Indicator 9.4.2 Employment opportunities, revenue, export and gainfully employed people in the environmental sector in Sweden (*this is only a nationally measured statistic that is aimed at supporting the global statistics): The net sales of the environmental sector are on an uneven, but upgoing, trend having increased from around 130 million kronor in 2003 to around 230 million kronor in 2018. On the other hand, people employed within this sector has decreased by a few percent since the peak of 2012.
  - *Indicator 9.4.3 Industrial investment in environmental protection per environmental area (*this is only a nationally measured statistic that is aimed at supporting the global statistics): The investments have increased during the 21st century in all environmental sectors, and the increase has exploded since 2016 having doubled in some sectors. In 2019 the investments from industry was more than 7,400 million kronor.
- Target 9.5 Enhance research efforts and technical capacity in the industrial sector:
  - *Indicator 9.5.1 Expenses for research and development as part of GDP:* Sweden spends 3.4% of the GDP on research and development, on an upgoing trend.
  - *Indicator 9.5.2 Researchers per million inhabitants:* Sweden has 7,517 researchers per million inhabitants as of 2019, of which 30% are female, and 70% male.
- Target 9.a Foster development of resilient infrastructure in developing countries:
  - *Indicator 9.a.1 Total official support to developing countries aimed for infrastructure:* As Sweden is one of the leading donors, both in absolute and per capita, to developing countries the support to infrastructure project is quite high. In 2019 it was 2,825 million kronor, and it has more than doubled since 2016.
- Target 9.c Access to information and communications technology for all:

[38] *Mål 9 – Hållbara städer och samhällen.* Retrieved from https://scb.se/hitta-statistik/temaomraden/agenda-2030/mal-9/?showAllContentLinks=True [retrieved 2022.02.01]

- *9.c.1 Part of population having mobile coverage, divided per technology (2G, 3G, 4G):* 100% of the population is covered by all of the three technologies, 2G, 3G, 4G, and has been for the past few years.

Sweden is well underway of meeting all targets for goal 9. The investments for sustainable industry and infrastructure have increased the last few years, and the previous prime minister, Stefan Löfven, instituted an innovation council in 2015 to further foster innovative solutions to societal challenges[39]. There are few, if any, constraints for Sweden to meeting the targets.

Goal 9 has no explicit linkages to coastal zones, although for some indicators one could gather more local information to find specific linkages, for indicator 9.1.3, 9.2.1, and 9.2.2. Others are quite clearly linked to the Paris agreement and merging some of the targets with the ambitions of the Paris agreement seems like a good opportunity, especially for indicator 9.4.1, which is an obvious linkage to the Paris agreement.

4.2.3 Reflections on Goal 11 - nationally and in coastal zones if applicable with a focus on Opportunities and constraints of meeting the goal's targets

Statistics Sweden provides data on Goal 11 with exception for target 11.3 Inclusive and sustainable urbanisation, target 11.4 Protect the world's cultural and natural heritage, target 11.a Strong national and regional development planning, as well as target 11.b Implement policies for inclusion, resource efficiency and disaster risk reduction.[40] National progress towards the targets is summarised below:

- Target 11.1 Safe and affordable housing:
  - *Indicator 11.1.1. Proportion of urban population living in slums, informal settlements or inadequate housing*: Not applicable to Sweden.
  - *Indicator 11.1.2 Overcrowding* (national indicator): From 2018-2019, 5% of the Swedish population live in overcrowded conditions, defined as more than two people per available bedroom (not taking into account single person households). This proportion has increased steadily within the past ten years, from around 3% in 2008-2009.
- Target 11.2 Affordable and sustainable transport systems:
  - *Indicator 11.2.1 Proportion of population that has convenient access to public transport by sex, age and persons with disabilities:* Around 90% for both men and women in 2008-2019, a proportion which has increased slightly within the past five years.
  - *Indicator 11.2.2 Proportion of residence buildings with convenient access to public transport* (national indicator): 83% in 2018, a proportion which has increased slightly within the past five years.
- Target 11.5 Reduce the adverse effects of natural disasters:
  - *Indicator 11.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population:* This number was 0 in 2019 and has remained so with a few exceptions.

[39] Regeringskansliet. Sveriges genomförande av Agenda 2030 för hållbar utveckling. Retrieved from https://www.riksdagen.se/sv/dokument-lagar/arende/betankande/sveriges-genomforande-av-agenda-2030_H801FiU28 [retrieved 2022.02.02]. P.94

[40] Statistics Sweden. *Mål 11 – Hållbara städer och samhällen.* Retrieved from https://www.scb.se/hitta-statistik/temaomraden/agenda-2030/mal-11/?showAllContentLinks=True#140631 [retrieved 2021.12.06]

- *Indicator 11.5.2 Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters:* This number was 0 Swedish kronor in 2019, and has remained 0 for the past five years.

- Target 11.6 Reduce the environmental impact of cities:
  - *Indicator 11.6.1 Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities:* Not applicable to Sweden.
  - *Indicator 11.6.2 Annual mean levels of fine particulate matter in cities:* 5,7 µg/m3, a number which has decreased slightly over time, from 7 µg/m3 in 2011.
  - *Indicator 11.6.3 Total amount of managed household waste per capita* (national indicator): 262 kgs in 2018.
  - *Indicator 11.6.4 Quality of air in or close to residences* (national indicator): This indicator is measured as the proportion of the population which is bothered by exhausts from cars in or close to their residency, which amounted to 20% of women and 14% of men in 2014. This is a decrease by a few percentages from 2007 when this proportion last was measured.
- Target 11.7 Provide access to safe and inclusive green and public spaces:
  - *Indicator 11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities:* The proportion of ground space in Swedish urban areas, which counts as public space, amounted to 52% in 2015.
  - *Indicator 11.7.2 People exposed to physical or sexual harassments:* 8% of women, and 5% of men have been harassed during 2019, most of which are under 25 years old.
  - *Indicator 11.7.3 Exposed to threat or violence* (national indicator): 7% of women, and 7% of men were exposed to violence during 2016, most of which happened at the workplace.
  - *Indicator 11.7.4 Abstained from going out at night due to concern about threat or violence* (national indicator): 24% of women and 6% of men have stayed at home due to concern about threats or violence during 2016. A significant downward trend from 2008-2011.
  - *Indicator 11.7.5 Access to green areas within 200 meters from home* (national indicator)*:* 94% of people live within 200 meters from green areas.
- Target 11.a Promote national and regional development
  - None of the indicators are measured in current national statistics.
- Target 11.b Implementing strategies for inclusion and resource efficiency and disaster risk reduction
  - None of the indicators are measured in current national statistics.

Similar to goal 9 Sweden does not experience any severe constraints in meeting the targets for goal 11 but highlights that one issue is the housing shortage which may lead to overcrowding[41]. This problem is also not evenly distributed in society, but affects people with a non-European background more severely[42]. Goal 11 does not explicitly speak about coastal zones, but the opportunities of focusing on one or a few indicators on a more local level are good. For example, indicators 11.5.1 and 11.5.2 could be locally measured as well.

[41] Regeringskansliet. Sveriges genomförande av Agenda 2030 för hållbar utveckling. Retrieved from https://www.riksdagen.se/sv/dokument-lagar/arende/betankande/sveriges-genomforande-av-agenda-2030_H801FiU28 [retrieved 2022.02.02]. P.100

[42] Regeringskansliet. Sveriges genomförande av Agenda 2030 för hållbar utveckling. Retrieved from https://www.riksdagen.se/sv/dokument-lagar/arende/betankande/sveriges-genomforande-av-agenda-2030_H801FiU28 [retrieved 2022.02.02]. P.100

4.2.4 Concluding statement on the SDGs

The SDGs do not specify anything on the coastal zones, making it difficult to track their sustainability. Several of the indicators could still be tracked on a local or regional level. Sweden, currently ranks second in the SDG index[43], has few constraints in meeting the targets, and has included several national indicators to complement the global indicators with additional statistics. Statistics Sweden has vast amounts of data that can be used for, not only the SDGs, but for several parts of the Sendai framework, or the Paris agreement as well.

[43] Author? Sustainable Development Report. Retrieved from https://dashboards.sdgindex.org/rankings [retrieved 2022.02.02]

4.3 The Sendai Framework (2015-2030)

4.3.1 Country statement of commitment to the Sendai Framework

Sweden is one of the world's least disaster-exposed countries, but still has the ambition to meet the Sendai Framework priorities and targets. As an example, the Swedish Civil Contingencies Agency (MSB) in 2015 commenced the work to develop the country's National Platform for Disaster Risk Reduction in order to bring it more in line with the priorities for action of the Framework.[44] As of now, there are six areas of collaboration within which approximately 50 Swedish authorities meet and collaborate, areas which are to be developed into even more strategic forums in order to promote coherent planning for crisis preparedness, including the implementation of the Sendai framework.[45]

4.3.2 Brief statement on the country's meeting of the framework's four priorities

1. Priority 1: Understanding disaster risk

Sweden has quite an elaborate system in place for understanding disaster risk, based on a "bottom-up" principle, where local disaster risk analyses feed into the regional and national understanding of disaster risks. All state authorities, municipalities and regions (Regioner; these are regional organisations responsible for providing services which require collaboration and efforts on a wider level than the municipalities, such as for instance health care and transport) are in Sweden obliged by law to carry out an analysis of risks and vulnerabilities (Risk- och Sårbarhetsanalys or RSA).[46] Authorities responsible for surveillance as well as certain authorities decided upon by the MSB have to send the MSB and the Government Offices (Regeringskansliet) a summary of their RSAs every two years. County administrative boards are responsible for compiling regional RSAs as well as supporting actors within their counties in conducting their RSAs. Regions are obliged to identify what extraordinary events may occur in times of peace, to identify socially important activities and dependencies, as well as to analyse risks and vulnerabilities and identify the need for measures. The results of these analyses have to be reported to the MSB and certain other authorities every fourth year. The same type of analysis has to be conducted by municipalities on a local level, and the municipalities have to hand over these analyses to the County Administrative Board every fourth year.

The MSB's work with the National Platform for Disaster Risk Reduction is likewise instrumental in promoting an understanding of disaster risks. Within the frames of this platform, the MSB continues the work carried out within the former national platform for work with natural disasters. This includes inter alia increasing knowledge and concrete measures for how to prevent and manage unfortunate events such as landslides, floods, an inundation, as well as the climate adaptation measures required to better manage the vulnerabilities and risks arising in society as an effect of a changing climate.[47]

2. Priority 2: Strengthening disaster risk governance to manage disaster risk

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[44] United Nations Office for Disaster Risk Reduction (26 April 2017). *Sweden Serious about Sendai.* Retrieved from https://www.undrr.org/news/sweden-serious-about-sendai [retrieved 2021.12.03]

[45] The Swedish Civil Contingencies Agency. *Sendairamverket.* Retrieved from https://www.msb.se/sv/amnesomraden/krisberedskap--civilt-forsvar/inriktning-och-ramverk/sendairamverket/ [retrieved 2021.12.03]

[46] The Swedish Civil Contingencies Agency. *Risk- och Sårbarhetsanalyser.* Retrieved from https://www.msb.se/sv/amnesomraden/krisberedskap--civilt-forsvar/risk--och-sarbarhetsanalyser/ [retrieved 2021.12.03]

[47] The Swedish Civil Contingencies Agency. Sendairamverket. Retrieved from https://www.msb.se/sv/amnesomraden/krisberedskap--civilt-forsvar/inriktning-och-ramverk/sendairamverket/ [retrieved 2021.12.03]

Apart from supporting the Swedish Government in governing risk on a national level, MSB also provides support for other authorities, municipalities, regions an enterprises with regards to managing disaster risk. The above-described chain of analyses contributes to an assessment of risks and vulnerabilities on a regional level, as well as to the National Risk and Capability Assessment that the MSB submits every two years to the Swedish Government.[48] The assessment is an analysis which describes threats, risks and development needs with regards to Swedish society's ability to prevent and manage crises as well as its capacity in terms of strengthening the civil defence.[49] The Swedish Government may use this assessment as basis for decision-making in its efforts of directing and developing crisis preparedness and civil defence.

In 2017 MSB undertook a research study to examine how the theoretical basis of the Sendai framework could work on a practical, more local, basis[50]. This study moreover contributes to both, the understanding of disaster risk in Sweden, as well as how to implement the framework in practice. Communication is highlighted as a potential problem area, specifically that the rhetoric of the urgency of disasters may confuse responsibility areas, and thereby being an obstacle to efficient governance.[51] Although, this study also reveals several avenues through which Sweden can improve their risk governance in relation to the Sendai framework, in figure 1 below several of these are listed.

[48] The Swedish Civil Contingencies Agency. *Nationell Risk- och Förmågebedömning.* Retrieved from https://www.msb.se/sv/amnesomraden/krisberedskap--civilt-forsvar/inriktning-och-ramverk/nationell-risk--och-formagebedomning/ [retrieved 2021.12.03]

[49] The Swedish Civil Contingencies Agency. *Nationell Risk- och Förmågebedömning.* Retrieved from https://www.msb.se/sv/amnesomraden/krisberedskap--civilt-forsvar/inriktning-och-ramverk/nationell-risk--och-formagebedomning/ [retrieved 2021.12.03]

[50] Amanda Haraldsson and Gunilla Reischl. The Sendai Framework Swedish Disaster Risk Reduction Governance. Retrieved from https://rib.msb.se/filer/pdf/28982.pdf [retrieved 2022.02.03] p. 2

[51] Amanda Haraldsson and Gunilla Reischl. The Sendai Framework Swedish Disaster Risk Reduction Governance. Retrieved from https://rib.msb.se/filer/pdf/28982.pdf [retrieved 2022.02.03] pp.47-48

Problems	Recommendations
4.4.1: The coordination forums exclude some actors, do not give enough attention to prevention and have too many other tasks	5.1.2: prevention given greater focus in DRR plans and strategies
	5.1.2: dialogue between local and national level on joint DRR strategy
	5.1.11: prevention and preparedness linked in DRR activities
4.4.2: The delegation of responsibility is unclear and government agencies in particular want more concrete communication surrounding this as well as budgets if their responsibility requires it	5.1.1: bottom-up approach to ensure implementation of lessons from Risk and Vulnerability reports
	5.1.3: need for better syncing of those who develop plans and those who have the responsibility to act
	5.1.9: using the expertise of government agencies such as MSB as well as those working in municipalities to inform where budgets are most needed for DRR could ensure better implementation
4.4.3: The difficulty, and sometimes reluctance, to include more and different types of actors in DRR work	5.1.1: approach private sector through positive incentive
	5.1.1: include private sector in writing of appropriate DRR plans
	5.1.10: awards for different types of stakeholder engagement
4.4.4: Interviewees felt that the political prioritization of DRR was much too low to ensure that the resources needed for DRR would be available	5.1.5: discourse on highest level should include progress of plans on local and national level
	5.1.8: budget and instruction specific to DRR to local authorities
	5.1.9: politicians should learn about the specifics of the Sendai Framework from practitioners
	5.1.11: support to expert agencies mapping risks and regularly inform relevant ministries of developing risks
4.4.5: DRR considered an issue for other countries, not Sweden	5.1.1: laws, regulations and policies should use DRR terminology, to try to produce a norm shift
	5.1.4: educate DRR workers that the Sendai Framework is not limited to natural disasters
4.4.6: Awareness of DRR issues in Sweden very low	5.1.7: much more should be done to build awareness of DRR within the general public
4.4.7: Communication issues (reluctance to use DRR terminology, researchers' difficulty communicating with practitioners, etc.)	5.1.3: more integration between practitioners from different sectors
	5.1.4: include science in disaster risk management
	5.1.5: making DRR data more uniform would make it easier for other actors to compare progress in different areas and sectors

Figure 1 Swedish governance problems and related recommendations based on the Sendai framework. Reprinted from Amanda Haraldsson and Gunilla Reischl. The Sendai Framework Swedish Disaster Risk Reduction Governance. Retrieved from https://rib.msb.se/filer/pdf/28982.pdf p.49

MSB commissioned the university of Reading to do a Gap analysis of Sweden's implementation of the Sendai framework with the purpose of developing a national action plan for DRR.[52] This was finished in 2021 and highlights similar challenges as the previous study, inter alia clarity and coherence, increased understanding, and better oversight.[53] It also highlights that Sweden has a strong focus on preparedness and response, but not as much on mitigation and adaptation.

3. Priority 3: Investing in disaster risk reduction for resilience

Since disaster risk reduction and resilience responsibilities lie with the municipalities in Sweden, they are, together with Länstyrelsen and MSB, the ones paying for measures implemented. A fund for disaster readiness, Fund 2:4, is distributed by MSB, which in 2021 got 1,3 million kronor to distribute to municipalities, governmental agencies, Länsstyrelsen, regions, volunteer organisations, and research.[54] This fund is the key investment in relation to disasters, aiming to improve the disaster readiness and the civil defence.

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52 Marie Aronsson-Storrier. Sweden and the Sendai Framework for Disaster Risk Reduction 2015-2030 A Gap Analysis. Retrieved from https://rib.msb.se/filer/pdf/29621.pdf [retrieved 2022.02.03] p.3

53 Marie Aronsson-Storrier. Sweden and the Sendai Framework for Disaster Risk Reduction 2015-2030 A Gap Analysis. Retrieved from https://rib.msb.se/filer/pdf/29621.pdf [retrieved 2022.02.03] p.39

54 Myndigheten för samhällsskydd och beredskap. Finansiering och anslag 2:4 Krisberedskap. Retrieved from https://www.msb.se/sv/amnesomraden/krisberedskap--civilt-forsvar/finansiering/ [retrieved 2022.02.04]

Besides Fund 2:4 there is a fund through which municipalities can get disaster preventative measures funded. This fund was established in 1986, but what it can be used for, and how much it contains, has shifted over the years. As of 2022 the fund was increased by over 2000% compared to 2021, from around 25 million kronor to over 500 million kronor, and it funds municipality measures to prevent flooding or landslides.[55] It specifically targets the built environment, and considers it is only to be used against flooding and landslides. It is reasonable to assume this money will be mainly used in coastal municipalities. Although, this also presents a constraint for coastal zones since erosion, a major problem in certain places, is not covered by this fund.

4. Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

   The focus of Swedish disaster risk reduction has largely been on either planning, or responding, with far less attention being given to recovery, rehabilitation and reconstruction[56]. Key legislation in Sweden to work in alignment with priority 4 is the civil protection act, which explains how Sweden has structured response responsibilities, mainly that municipalities are in charge of both the rescue service (response), and the follow-up after a disaster in terms of costs incurred during response (reconstruction)[57].

4.3.3 Brief statement on the country's meeting of the framework's seven targets

1. Reduce disaster mortality

   As mentioned above, Sweden is one of the world's least disaster-exposed countries. Indicator 11.5.1 under the Sustainable Development Goals measures the number of persons who are dead, missing or directly affected by disasters. The latest number for this indicator is from 2019, where the number of dead, missing or directly affected persons was zero.[58] This has largely remained the case for the last 15 years, with the exception of 2005 (7 persons dead or missing), 2007 (3 persons dead or missing), and 2014 (1 person dead or missing as well as 2 people directly affected).[59]

2. Reduce the number of people affected

   As mentioned under target *1. Reduce disaster mortality* above, the number of persons directly affected by disasters has remained 0 since 2005, with the exception of 2014 when 2 people were directly affected.

3. Reduce direct economic loss in relation to GDP

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55 Myndigheten för samhällsskydd och beredskap. Sex kommuner fick statsbidrag för förebyggande åtgärder mot naturolyckor 2021 – nästa år ökar summan rejält. Retrieved from https://www.mynewsdesk.com/se/msb/pressreleases/sex-kommuner-fick-statsbidrag-foer-foerebyggande-aatgaerder-mot-naturolyckor-2021-naesta-aar-oekar-summan-rejaelt-3152217 [retrieved 2022.02.04]

56 Wamsler et al. Developing a national strategy for disaster risk reduction and resilience in Sweden. Retrieved from https://rib.msb.se/filer/pdf/28981.pdf [retrieved 2022.02.04] p. 22

57 Wamsler et al. Developing a national strategy for disaster risk reduction and resilience in Sweden. Retrieved from https://rib.msb.se/filer/pdf/28981.pdf [retrieved 2022.02.04] p. 80

58 Government Offices of Sweden. Prime Minister´s Office (2017). *National Security Strategy.* Retrieved from https://www.government.se/4aa5de/contentassets/0e04164d7eed462aa511ab03c890372e/national-security-strategy.pdf [retrieved 2021.12.03]

59 Government Offices of Sweden. Prime Minister´s Office (2017). *National Security Strategy.* Retrieved from https://www.government.se/4aa5de/contentassets/0e04164d7eed462aa511ab03c890372e/national-security-strategy.pdf [retrieved 2021.12.03]

Statistics Sweden reports the direct economic losses as an effect of disasters and in relation to GDP to be 0.[60] This number has remained 0 since 2015 (i.e. from when Statistics Sweden has reported this number).

4. Reduce disaster damage to critical infrastructure

In 2014 MSB released the 'Action Plan for the Protection of Vital Societal Functions & Critical Infrastructure' with the aim of establishing concrete measures and strategies to protect critical infrastructure within Sweden[61]. Although this action plan was established before the establishment of the Sendai framework it clearly deals with issues connected to target 4.

Unfortunately, there are no direct statistics, in terms of numbers or money, that shows the extent to which Swedish critical infrastructure has been affected by disaster damage.

5. Increase national and local disaster risk reduction strategies

In 2017, the Swedish Government established a national security strategy, which for the first time sets out the country's overall approach to security in a broad sense.[62] This strategy also composes the country's national disaster reduction strategy. In collaboration with external actors, the Swedish Civil Contingencies Agency develops an action plan with concrete measures, national indicators, and timeframes for the strategy.

As for local disaster risk reduction strategies, indicator 11.b.2 under the Sustainable Development Goals measures the proportion of local authorities which adopt and implement local disaster risk reduction strategies. According to the SCB, this indicator is yet to be accounted for, and this will be done in future publications on behalf of the authority.[63]

6. Enhance international cooperation on risk reduction

Sweden does a lot of work internationally within DRR. There are different cooperative mechanisms in place, with the EU, with Nordic countries, with the UN, or with the Baltic states, to name but a few.[64] Moreover, Sweden's significant development aid also facilitates international cooperation. Often in the form of rehabilitation and rebuilding processes after a major disaster.

7. Increase availability and access to multi-hazard early warning systems

Sweden receives good real time data from the Swedish Meteorological Agency (Sveriges Meterologiska och Hydrologiska Institut (SMHI)). The early warning systems are however often different depending on the disaster, they are rarely multi-hazard early warning systems.[65] The most utilised early warning system today in Sweden is "Hesa Fredrik". A sound alarm that exists in most,

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60 Government Offices of Sweden. Prime Minister´s Office (2017). *National Security Strategy.* Retrieved from https://www.government.se/4aa5de/contentassets/0e04164d7eed462aa511ab03c890372e/national-security-strategy.pdf [retrieved 2021.12.03]

61 Myndigheten för samhällsskydd och beredskap. Action Plan for the Protection of Vital Societal Functions & Critical Infrastructure Retrieved from https://www.msb.se/siteassets/dokument/publikationer/english-publications/action-plan-for-the-protection-of-vital-societal-functions--critical-infrastructure.pdf [retrieved 2022.02.04] p.9

62 Government Offices of Sweden. Prime Minister´s Office (2017). *National Security Strategy.* Retrieved from https://www.government.se/4aa5de/contentassets/0e04164d7eed462aa511ab03c890372e/national-security-strategy.pdf [retrieved 2021.12.03]

63 Statistics Sweden. *Mål 11 – Hållbara Städer och Samhällen.* Retrieved from https://www.scb.se/hitta-statistik/temaomraden/agenda-2030/mal-11/?showAllContentLinks=True#140633 [retrieved 2021.12.06]

64 Marie Aronsson-Storrier. Sweden and the Sendai Framework for Disaster Risk Reduction 2015-2030 A Gap Analysis. Retrieved from https://rib.msb.se/filer/pdf/29621.pdf [retrieved 2022.02.06] pp.35-36

65 Marie Aronsson-Storrier. Sweden and the Sendai Framework for Disaster Risk Reduction 2015-2030 A Gap Analysis. Retrieved from https://rib.msb.se/filer/pdf/29621.pdf [retrieved 2022.02.06] p.16

but not all, Swedish cities that warns for immediate dangers such as war, toxic releases, extreme weather, or fires.[66]

4.3.4 Implications of implementing the Sendai Framework on risk reduction in coastal zones

For Sweden, where coastal zones make up much of the country's built environment, especially the three major urban areas Stockholm, Gothenburg, and Malmö, dealing with risk reduction in coastal zones is largely dealing with disaster risk for urban areas. The implementation of the Sendai Framework in coastal zones does not contain many constraints in the Swedish context, partly due to that almost half of the population lives within five kilometres from the coast, and that 97% of the total population increase between 1996 and 2006 were in the coast, showing that coastal zones are developing areas.[67]

For one risk that solely affects the coast, erosion, there are no direct funding mechanisms from MSB. This may inhibit erosion protection measures in local municipalities since they will have to pay for everything themselves. Erosion will affect the built environment in coastal zones in the long run. An eroding coast will lead to more severe impacts of storms in coastal societies, especially in the Swedish southwestern coastal areas.[68]

4.3.5 Summary of opportunities and constraints

Wamsler and Johanessen analysed Sweden's approach to comply with the Sendai framework.[69] The key challenges found in that article correspond well with what has been highlighted thus far in this analysis. The opportunities and constraints for implementing the Sendai framework in Sweden are briefly described below.

The understanding of risk

As priority one of the Sendai framework highlights, understanding risk is key to work with it on all levels. In Sweden, dealing with risk is mainly manifested as responding to disaster or preparing for disaster.[70] This lack of comprehensive understanding of the concept of risk among key stakeholders inhibits nuancing the way risk is approached. This approach does also not include risk factors to any significant extent, leading to measures that are developed in silos instead of collaborative action.[71]

Data collection

For the SDGs, Statistics Sweden collects and analyses vast amounts of data, this data is also partly relevant for the priorities and targets within the Sendai framework. For example, how much of GDP that has been lost due to disasters, target 3, how many people are killed/affected by disasters, target 1 and 2. Together with SMHI, the methodologies developed to find and analyse data can further strengthen the understanding of how Sweden is affected by disaster, and how they will be affected in the future.

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66 Försvarsmakten. Så föddes "Hesa Fredrik". Retrieved from https://www.forsvarsmakten.se/sv/information-och-fakta/var-historia/artiklar/hesa-fredrik/ [retrieved 2022.02.06]

67 Boverket. Vad Händer med kusten? Retrieved from https://www.boverket.se/globalassets/publikationer/dokument/2006/vad_hander_med_kusten.pdf [retrieved 2022.02.06]

68 Naturvårdsverket. Effekter i Sverige. Retrieved from https://www.naturvardsverket.se/amnesomraden/klimatfakta/klimatet-i-framtiden/effekter-i-sverige/ [retrieved 2022.02.06]

69 Christine Wamsler and Åse Johannessen. (2020). *Meeting at the crossroads? Developing national strategies for disaster risk reduction and resilience: Relevance, scope for, and challenges to, integration*. International Journal of Disaster Risk Reduction (45).

70 Christine Wamsler and Åse Johannessen. (2020). *Meeting at the crossroads? Developing national strategies for disaster risk reduction and resilience: Relevance, scope for, and challenges to, integration*. International Journal of Disaster Risk Reduction (45). P.4

71 Christine Wamsler and Åse Johannessen. (2020). *Meeting at the crossroads? Developing national strategies for disaster risk reduction and resilience: Relevance, scope for, and challenges to, integration*. International Journal of Disaster Risk Reduction (45). P.4

Although, the problem right now is that frequencies of rapid or slow onset disasters, of major or minor disasters, is not monitored.[72] Statistics Sweden has the responsibility to develop the data needed to fulfil the SDGs, but not for the Sendai framework. Without the basic data of how often a major or minor disaster happens in any given place, it begs the question of how key actors on local level can make informed, strategic, decisions about their future.

Financing resilience

Currently, MSB controls most of the funds available for municipalities to both respond and prepare for risks through fund 2:4, but also to build adaptive measures to deal with disaster risk. The latter fund can be used for preventive measures against landslides or floods, and was increased by 2000% in 2022 compared with 2021.[73] Which shows the renewed ambition of the Swedish government to deal with the risk of disasters. This step is very important since the cost of dealing with hazards has gone up for local actors, and the funding has predominantly been aimed for crisis management, not prevention and mitigation.[74] Although, one problem with this fund, especially in coastal areas, is that the funds cannot be used to prevent erosion, which is a major problem in many Swedish coastal areas, and which will exacerbate disasters.[75]

Institutional cooperation

Policies, strategies, and implementation ranging from nation-wide to local are currently not very much aligned. One example of this is that long-term risk reduction strategies, that could and should, be implemented on a local level, do not do so because the 'responsibility' of those plans does not fall under disaster risk reduction. Such measures are often instead treated as climate adaptation measures, and not disaster risk reduction measures.[76] This example shows the problem of working in silos when dealing with disaster risk.

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72 Christine Wamsler and Åse Johannessen. (2020). *Meeting at the crossroads? Developing national strategies for disaster risk reduction and resilience: Relevance, scope for, and challenges to, integration*. International Journal of Disaster Risk Reduction (45). P.4

73 Myndigheten för samhällsskydd och beredskap. Sex kommuner fick statsbidrag för förebyggande åtgärder mot naturolyckor 2021 – nästa år ökar summan rejält. Retrieved from https://www.mynewsdesk.com/se/msb/pressreleases/sex-kommuner-fick-statsbidrag-foer-foerebyggande-aatgaerder-mot-naturolyckor-2021-naesta-aar-oekar-summan-rejaelt-3152217 [retrieved 220207]

74 Christine Wamsler and Åse Johannessen. (2020). *Meeting at the crossroads? Developing national strategies for disaster risk reduction and resilience: Relevance, scope for, and challenges to, integration*. International Journal of Disaster Risk Reduction (45). P.6

75 Naturvårdsverket. Effekter i Sverige. Retrieved from https://www.naturvardsverket.se/amnesomraden/klimatfakta/klimatet-i-framtiden/effekter-i-sverige/ [retrieved 2022.02.07]

76 Christine Wamsler and Åse Johannessen. (2020). *Meeting at the crossroads? Developing national strategies for disaster risk reduction and resilience: Relevance, scope for, and challenges to, integration*. International Journal of Disaster Risk Reduction (45). P.5