Annex 11 — Sweden country case study

BLOSSOM: Support to analysis for long-term governance and institutional arrangements

European Environment Agency

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This case study report is one of 12 reports completed for the following EU Member States: Germany, Spain, France, Hungary, Netherlands, Austria, Poland, Portugal, Slovenia, Finland, Sweden, United Kingdom.

The opinions and conclusions presented here are the sole responsibility of the consultants and do not necessarily reflect those of EEA.

Acronyms

BLOSSOM	**B**ridging **LO**ng-term **S**cenarios and **S**trategic analysis — **O**rganisation and **M**ethods
EEA	European Environment Agency
EQO	Environmental Quality Objective
EPA	Sweden's Environmental Protection Agency
EU	European Union
Miljömålsutredningen	Government Commission on Environmental Quality Objectives
Miljömålsrådet	Environmental Objectives Council
Miljömålsrådets kansli	Secretariat of Environmental Objectives Council

1 Introduction

1.1 Introduction

This report sets out the current status of the main institutional and governance arrangements for futures thinking in Sweden with respect to environmental — and environment-related — policymaking. It is an update of the case study report completed under the previous Blossom project in October 2009 and is based on a review of changes in documentation and other available resources, and a set of interviews with high-level officials and experts in relevant government departments, agencies and institutions. The aim has been to understand how futures thinking is undertaken in Sweden, the relationships between different futures programmes, and how these relate to and influence environmental policymaking. The report particularly tries to identify the success factors in ensuring futures thinking is embedded in environmental policymaking; however, barriers to success are also identified. It does not seek to explore the whole range of futures work, only those aspects of most relevance to environmental policymaking, and is focused on the institutional and governance structures, not the details of the futures studies or the quality of those studies.

In 2009, the previous version of this report, along with similar reports for seven other EU Member States, formed the basis for further cross-country analysis during the summer of 2009 to identify common themes and issues in institutional and governance arrangements, as well as distinctive aspects of different cultural and administrative traditions and approaches to futures thinking. This updated report has been used to inform a revised cross-country analysis, which has also drawn upon new case studies in four additional countries: Germany, Hungary, Austria and Portugal.

This study presents the results of an attempt to synthesise and evaluate current practices: it is meant to shed light on important developments and stimulate discussion but it is not meant to be understood as a comprehensive and concluding assessment of futures-oriented studies or their impacts on decision-making.

The update to this report (2010) focuses on describing the outcomes of an inquiry that was put forward by the ad hoc Committee for the Environmental Quality Objectives (EQOs) in September 2009. The purpose of the inquiry was to review the current system around the EQOs and propose changes to its structure and organisation with the aim of getting a more effective system in place. The majority of the proposals put forward by the ad hoc committee in September 2009 were subsequently brought forward in a government bill submitted in March 2010, which was discussed and approved by the parliament on 22 June 2010.

2 The landscape for long-term thinking and governance in Sweden

Futures-oriented studies are undertaken in many parts of Swedish government. Moreover, the country has a long tradition of carrying out these sorts of studies: the defence sector was perhaps the first to do so. In the early 1970s, the government created a Secretariat for Future Studies. This body was originally connected to the Prime Minister's Office but, in 1980, it became a unit under the Research Council Committee (Forskningsrådsnämnden) and, in 1987, it became an independent research foundation, the Institute for Future Studies.

It should be emphasised that this Institute is in no way a central body for futures-oriented studies. Indeed, one of the key characteristics in Sweden is that futures-oriented work is carried out independently by many different bodies in the public sector. Moreover, as yet no overview of the many different studies and initiatives has been found.

Futures-oriented studies play an important role in Sweden's environmental policy and in particular for the country's Environmental Quality Objectives (EQOs). These objectives set targets across 16 environmental themes: Table 1 presents the 16 themes, their main long-term quality objectives and selected interim targets.

The Swedish Government approved the objectives in 1999 and they were endorsed by parliament the same year in a resolution: the EQOs thus have a formal status in terms of Swedish environmental policy, though they are not legally binding ([1]). The EQOs define the state of the environment and provide a coherent framework for environmental programmes and initiatives at national, regional and local level. The EQOs were created with the goal of implementing measures to resolve the country's major environmental problems 'within a generation'; the main targets were set for the year 2020; climate change targets were for 2050; and a series of interim targets were set for 2010. Futures thinking played a role in setting up these long-term objectives: one influential study was *Sweden in the Year 2021* (completed in 1998). Moreover, future studies have been crucial in evaluating whether the EQO targets will be met.

The style of governance in Sweden reflects the Nordic cultural tradition as described by Perlitz and Seger, 2004. In this model, Sweden has a relatively low 'power distance', implying an egalitarian tradition and little hierarchy. In Sweden and other Nordic countries, the 'masculinity' of the culture is low, and this means a more caring society. Another cultural dimension is the 'avoidance of uncertainty': in Sweden and in other Nordic countries this is relatively low, meaning that people can live comfortably with the uncertainty of the future and this reflects, according to Perlitz and Seger, optimism about the future.

These aspects mean that Sweden has an egalitarian and decentralised model of management and approach to governance. This can be seen in the structure of government. Swedish ministries are relatively small and focus on policymaking. They prepare policy decisions for agencies to carry out, but do not (and cannot) issue direct orders. Thus, government agencies act independently to carry out the policies of the Swedish Government.

These aspects can be seen in the high level of cross-sectoral and stakeholder participation. For example, the work to achieve the EQOs has been coordinated by the Environmental Objectives Council (2002–2010) with representatives from different government bodies and stakeholders. Futures-oriented studies carried out for the EQOs involve extensive participatory methods involving officials and experts from across government, the business sector and non-governmental organisations.

([1]) The OECD (Organisation for Economic Cooperation and Development) refers to three central elements for Swedish environmental policy: the EQOs; the country's environmental code, which was consolidated from previous environmental legislation in 1999; and EU environmental policy and law, OECD, 2004, *Environmental Performance Reviews: Sweden*, Paris.

Table 1 Sweden's environmental quality objectives and examples of interim targets ([2])

No	Objective	Key targets	Overall 2009 assessment	Development trend
1	Reduced climate impact	• By 2050, the ambition is that Sweden will have no net emissions of greenhouse gases (GHG) into the atmosphere • Interim target 2008–2012: GHG emissions to be at least 4 % lower than in 1990	Very difficult to achieve	
2	Clean air	• Overall goal: air must be clean enough not to represent a risk to human health or to animals, plants or cultural assets • Five interim targets: e.g. by 2010, ground-level ozone will not exceed 120 µg/m³ as an 8-hour mean	Very difficult to achieve	
3	Natural acidification only	• Overall goal: the acidifying effects of deposition and land use must not exceed the limits that can be tolerated by soil and water • Four interim targets: e.g. by 2010, not more than 5 % of all lakes and 15 % of river courses will be affected by anthropogenic acidification	Very difficult to achieve	
4	A non-toxic environment	• Overall goal: the environment must be free from man-made or extracted compounds and metals that threaten human health or biological diversity • Nine interim targets: e.g. by 2015, the dietary and occupational exposure of the population to cadmium will be at a level that is safe from a long-term public health point of view	Very difficult to achieve	
5	A protective ozone Layer	• Overall goal: the ozone layer must be replenished so as to provide long-term protection against harmful UV radiation • Interim target: by 2010, the great majority of emissions of ozone-depleting substances will have ceased	Can be achieved within the defined time frame	
6	A safe radiation environment	• Overall goal: human health and biological diversity must be protected against the harmful effects of radiation in the external environment • Three interim targets: e.g. by 2020, the reported number of annual cases of skin cancer caused by ultraviolet radiation will not higher than in the year 2000	Provided that further action is taken, the objective can be achieved	
7	Zero eutrophication	• Overall goal: nutrient levels in soil and water must not adversely affect human health, biological diversity or varied use of land and water • Four interim targets: e.g. by 2010, waterborne anthropogenic emissions of phosphorus compounds into lakes, streams and coastal waters will have decreased by at least 20 % from 1995 levels	Very difficult to achieve	
8	Flourishing lakes and streams	• Overall goal: lakes and watercourses must be ecologically sustainable and their variety of habitats must be preserved • Three interim targets: e.g. by 2005, action plans for natural and cultural environments in the vicinity of lakes or streams, that are of particularly high conservation value and require long-term protection shall have been developed	Provided that further action is taken, the objective can be achieved	

([2]) Swedish Environmental Objectives Council, 2009, Miljömålen I halvtid (Sweden's Environmental Quality Objectives at half-time), de Facto, 2009.

9	Good quality groundwater	Overall goal: groundwater must provide a safe and sustainable supply of drinking water and contribute to viable habitats for flora and fauna Three interim targets: e.g. by 2010, all major drinking water sources (> 50 persons or > 10 m^3 per day) shall meet the standards for good quality drinking water	Provided that further action is taken, the objective can be achieved	
10	Balanced marine environment, flourishing coastal areas and archipelagos	Overall goal: the North Sea and the Baltic Sea must have a sustainable productive capacity and biological diversity preserved Six interim targets: e.g. by 2010, long-term protection shall be provided for 50 % of valuable marine and 70 % of valuable cost and archipelago areas	Very difficult to achieve	
11	Thriving wetlands	Overall goal: the ecological and water-conserving function of wetlands in the landscape must be maintained and valuable wetlands preserved Three interim targets: e.g. at least 12 000 hectares of wetlands and ponds will be established or restored on agricultural land by 2010	Provided that further action is taken, the objective can be achieved	
12	Sustainable forests	Overall goal: the value of forests and forest land for biological production must be protected at the same time as biological diversity and cultural heritage and recreational assets are safeguarded Three interim targets: e.g. a further 900 000 hectares of forest land of high conservation value will be excluded from forest production by the year 2010	Very difficult to achieve	
13	A varied agricultural landscape	Overall goal: the value of the farmed landscape and agricultural land for biological production and food production must be protected at the same time as biological diversity and cultural heritage assets are preserved and strengthened Four interim targets: e.g. by 2005, a strategy will have been developed for how the conservation of small-scale habitats in the meadow and pasture land could be increased	Provided that further action is taken, the objective can be achieved	
14	A magnificent mountain landscape	Overall goal: the pristine character of the mountain environment must be largely preserved, in terms of biological diversity, recreational value, and natural and cultural assets Three interim targets: e.g. at least 60 % of light all-terrain vehicles will meet stringent noise standards (below 73 dBA) by 2015 to reduce noise in mountain areas from motor vehicles driven off-road	Provided that further action is taken, the objective can be achieved	
15	A well-built environment	Overall goal: cities, towns and other built-up areas must provide a good, healthy living environment and contribute to a good regional and global environment Seven interim targets: e.g. total energy consumption per unit area heated in residential and commercial buildings will decrease, with target reductions of 20 % by 2020 and 50 % by 2050, compared to consumption in 1995	Very difficult to achieve	
16	A rich diversity of plant and animal life	Overall goal: biological diversity must be preserved and used sustainably for the benefit of present and future generations Three interim targets: e.g. by 2007, methods for following up on whether the biological diversity and the biological resources (both on land and in water) are used in a sustainable way shall have been developed	Very difficult to achieve	

The futures analysis of the EQOs has led to an uncomfortable conclusion: most of the objectives will likely not be achieved, as can be seen in Table 1. The situation also appears to have become worse over the years: in 2004, the Environmental Objectives Council (Miljömålsrådet), set up to oversee implementation of the EQOs, estimated that four of the objectives appeared 'to be particularly difficult to achieve' ([3]) and in its 2008 in-depth review, the Council concluded that: '… more than half of [the EQO] will be very difficult or not possible to attain within the defined time frame'. In its annual review in 2009, the Council concluded that nine of the EQO will be 'very difficult or not possible to attain within the defined time frame even if additional measures are provided' ([4]). At the same time, the development trend for several EQO was, however, reported to be positive. The Council also concluded that it is a matter of urgency if the EQOs are to be met and that with regards to four of the EQOs (No 1, Reduced climate impact; No 4, A non-toxic environment; No 10, Balanced marine environment; No 16, A rich diversity of plant and animal life), there is a high risk of sudden or irreversible changes, in which case the EQOs will not be met. The EQO No 1, Reduced climate impact also has a negative development trend.

In the government bill put forward in March 2010 and subsequently adopted in June 2010, it is suggested that four of the EQOs (No 1, Reduced climate impact; No 4, A non-toxic environment; No 15, A well-built environment; No 16, A rich diversity of plant and animal life) will be difficult to reach even if additional measures are implemented. EQO No 5, A protective ozone layer, is the only EQO that is expected to be reached. The remaining EQOs are expected to be reached 'within one generation if additional measures are put in' ([5]) (recall that the EQOs were created with the goal of implementing measures to resolve the country's major environmental problems 'within a generation'). Slightly revised goal descriptions have also been suggested for EQO No 1, Reduced climate impact; No 3, Natural acidification only; No 4, A non-toxic environment; and No 6, A safe radiation environment.

Section 3 on analysis will return to this issue, including the fact that the problem was inherent in the way that the EQOs were drafted by the government and parliament.

2.1 Responsibilities

As noted, Sweden's government does not have a central or coordinating body for futures-oriented studies. Rather, according to one recent study, 'most authorities have some form of [foresight] activities' (this study defines foresight activities to include scanning, SWOT-analysis, trend analysis, future studies and scenario construction and other activities 'trying to detect and analyse change in the surroundings of the organisation') ([6]). Recent examples include the Swedish National Board of Health and Welfare, which carried out an analysis of future public health issues in 2006, and the National Heritage Board, which also performed a study that year ([7]).

One body is dedicated to the field of futures-oriented thinking, the Swedish Institute for Future Studies, an independent public research foundation financed partly through government funds and partly through external grants from public and private sources. The research goal of the Institute for Future Studies is: 'to pursue futures studies, long-range analyses and, thereby, connected activities, under its own auspices or in cooperation with others, with the objective of stimulating an open and broad discussion of future threats to social development as well as the opportunities therein.' The institute's work is thus linked to policy issues but not necessarily to immediate government priorities and needs. The institute also works on methodologies for future studies ([8]).

([3]) Swedish Environmental Objectives Council, 2004, *Sweden's Environmental Objectives — A Shared Responsibility,* Stockholm, p. 4.
([4]) Swedish Environmental Objectives Council, 2009, *Miljömålen — i halvtid* (Sweden's Environmental Quality Objectives at half-time), inside cover page.
([5]) Svenska miljömål — för ett effektivare miljöarbete (Swedish Environmental Objectives — for more effective environmental work), Regeringens proposition 2009/10:155 p. 15.
([6]) Torbjörn Lundqvist, *The Emergence of Foresight Activities in Swedish Government Authorities*, Institute for Future Studies, Stockholm, Working Paper 2009:5, pp. 3 and 13.
([7]) Swedish National Heritage Board, 2007, *Jordbruksverkets miljömålsöversyn*, Rapport 2007:14, 27 September 2007.
([8]) Further information is available online (http://www.framtidsstudier.se/eng/redirect.asp?intLevel1Clicked=1602&p=1602), accessed May 2009.

The institute's current research programme, for 2009–2013, so far has eight main research projects:

- Integration and pluralism in the future society
- Social exclusion — causes and effects
- Welfare state financing
- Futures studies on futures studies
- Effects of climate change
- Effects of technological development
- Gender, care and the life cycle
- National and global migration.

The research programme will investigate these topics across a series of 'profile areas':

- population and economy
- regions in transition
- children's and young peoples' living conditions
- social policy and deprivation
- the European social model.

Thus, social issues are prominent in the institute's work programme: environmental themes are mainly covered in terms of the possible impacts on economy and society, in particular from climate change.

In the area of environment, the leading government body is the **Ministry of the Environment**, whose work includes the preparation of legislation and government decisions. The implementation of decisions is generally entrusted to the agencies reporting to the ministry.

In particular, the **Swedish Environmental Protection Agency** (EPA) coordinates and promotes environmental work at national level, in the EU and at international level and thus is a central body for implementing policy decisions concerning the environment. The agency produces and communicates knowledge in the field of the environment, drafts proposals for objectives, action strategies and policy instruments in environmental policy and implements environmental policy decisions.

The first future study initiated by the EPA — 'Hur ska Sverige må år 2020?' (What should Sweden's health be in the year 2020?) — addressed some of the country's most important environmental issues. For each issue, three scenarios were studied: business as usual (no change); implementation of current policy decisions; and the actions needed to avoid changes for the worse before 2020. The study showed that even with the implementation of policy decisions made at the time, most environmental problems will get worse. The report received wide recognition and became a wake-up call that lead to the initiation of the EPA's *Sweden in the Year 2021* project.

The *Sweden in the Year 2021* study was initiated by the EPA and managed by an ad hoc independent office that brought together various central government agencies, non-governmental organisations and the business sector.

The EPA provided the secretariat for the **Environmental Objectives Council** (Miljömålsrådet) up to June 2010. This Council was established in January 2002 by the Swedish Government to promote consultation and cooperation in implementing the environmental quality objectives adopted by Parliament. The Council consisted of representatives of the heads of the following government agencies:

- EPA
- Swedish Radiation Safety Authority
- Swedish Chemicals Agency (KemI)
- Geological Survey of Sweden (SGU)
- Swedish Forest Agency
- Swedish Board of Agriculture
- National Board of Housing, Building and Planning
- Swedish National Institute of Public Health
- National Board of Health and Welfare
- Swedish Road Administration
- Swedish Energy Agency
- Armed Forces
- Swedish Board of Fisheries
- Formas (Swedish Research Council).

Other representatives on the Council came from the county administrative boards. Five stakeholder experts also participated: local authorities (Swedish Association of Local Authorities and Regions, (SALAR), environmental non-governmental organisations (Swedish Society for Nature Conservation, SSNC, and Friends of the Earth Sweden) and the business sector: the Confederation of Swedish Enterprise and the Federation of Swedish Farmers.

The principal functions of the Council were:

- to monitor and evaluate progress towards the environmental objectives;
- to report to the government on how efforts to achieve the objectives are advancing and what further action is required;
- to coordinate the information efforts of responsible authorities;
- to ensure coordination of the regional application of the objectives;

- to allocate funding for monitoring of progress towards the objectives, environmental monitoring, and reporting at international level.

Each year, the Environmental Objectives Council submitted a report to the Swedish Government on how efforts to achieve the country's 16 environmental quality objectives and the 72 interim targets associated with them were progressing. Every fourth year, the Council provided the Swedish Government with a more comprehensive report evaluating the prospects of achieving the environmental goals on time.

Futures-oriented studies have been used at several stages in the EQO process. The most recent in-depth evaluation reports, released in 2008, in particular used futures-oriented studies. Table 2 lists the futures studies used in the EQO work through to 2008.

In 2008, the government created a separate **Commission on Environmental Quality Objectives** to review the system and report by the end of September 2009 (henceforth referred to as the 'Inquiry'). The Commission was tasked to assess if resources were being used effectively, the priorities were correct and if it is possible to simplify the system and make it more effective. While not explicitly stated in its goals, the Commission also addressed the problem that — as seen in Table 1 — Sweden will not meet the majority of its EQO targets.

While the EQO process has become a focal point for futures work related to the environment, some studies are not directly related to the EQOs. For example, the Swedish EPA and Mistra, a government foundation, carried out a study on **Environmental Foresight — a Swedish Challenge** in 2006 and 2007. The study examined the comparative advantages of the Swedish economy in the perspective of the pursuit of sustainable development. (No information has been found, however, on its impact on policy.)

2.1.1 Proposed responsibilities under the new EQO system

In the government bill put forward in March 2010 (Box 1) and subsequently adopted in June 2010 (in which most of the proposals from the 2009 Inquiry were included), it was recognised that the work on the EQO so far had been working well with regards to the follow-up and the reports on the state of the environment. With regards to the strategies for attaining the goals or their interim targets, the system had, however, not worked so well. Hence, it was recognised that the system needed to be improved with regards to giving clearer guidance on how the EQOs can be reached. The systems' review by the ad hoc Commission was undertaken in order to find possible efficiencies and simplifications to the system that would lead to increased economic efficiency as well as a more pragmatic strategy for attaining the goals.

In order to overcome the identified weaknesses with the system, the adopted governmental bill will enforce a number of institutional changes as well as changes to the system of EQO itself and the way the targets are formulated ([9]).

The tasks to regularly follow-up on the state of the environment and evaluate the possibilities to reach the targets will be separated from the task to develop strategies with associated impact analysis and proposals for so-called milestone targets, policies and measures. To this end, the Environmental Objectives Council has been closed down.

Instead, a parliamentary committee will be established consisting of representatives of the political parties, which will be commissioned by the government to develop advice on how the EQOs can be met. The Parliamentary Committee will be responsible for developing strategies with associated impact analysis and proposals for so-called milestone targets, policies and measures (through ad hoc working groups). The task to develop impact analysis will include looking at alternative action plans and, according to Pirjo Körsén, these action plans will in many cases need to be based on futures scenario analysis ([10]).

The establishment of a parliamentary committee is thought to generate politically anchored proposals that have a greater likelihood of being implemented.

The *government* will be responsible for the different milestones leading to the EQOs and for reporting to the parliament. The government will assign the task of developing strategies to achieve the EQOs to the

([9]) Regeringskansliet (2009), Svenska miljömål — för ett effektivare miljöarbete (Swedish Environmental Objectives — for a more effective environmental work), Regeringens proposition/Government Bill 2009/10:155.
([10]) Pirjo Körsén, interview, 25 May 2010, and e-mail, 29 April 2010.

Table 2 Future studies used in EQO work from 1993 to 2008

Future study	Relevant environmental quality objectives	Responsible authority
Hur ska Sverige må 2020' 1993	Reduced climate impact A protective ozone layer Clean air Natural acidification only Zero eutrophication A non-toxic environment A rich diversity of plant and animal life	EPA
Sweden in the Year 2021, 1996	Reduced climate impact Clean air Natural acidification only Zero eutrophication A non-toxic environment A balanced marine environment, flourishing coastal areas and archipelagos Sustainable forests A varied agricultural landscape A well-built environment A rich diversity of plant and animal life	Coordinated by the EPA
Kontrollstation — Control Station 2004 and 2008	Focus on Reduced climate impact but also Clean air, Only natural acidification and a Protective ozone layer	The EPA and the Swedish Energy Agency
Skogslig konsekvensanalys (Forestry Consequence Analysis), SKA 99 (1998–2000), SKA 03 (2003), 'Kund och intresseanalys' (Client and interest analysis), Projekt stormanalys (Storm analysis project) (2006)	Sustainable forests	Swedish Forest Agency
No 'real' futures studies but reports that touch on the subject, e.g. 'Framtida hot och möjligheter för betesmarken' (Future threats and possibilities for pastureland) (Jordbrukets miljöeffekter 2020 — en framtidsstudie. Jordbruksverket rapport 2007:7)	A varied agricultural landscape	Swedish Board of Agriculture
'Sverige 2009 — förslag till vision' (Sweden 2009 — A suggested vision) (2004)	A well-built environment	National Board of Housing, Building and Planning
In-depth evaluation of the EQOs 2006–2008	All EQOs	Coordinated by the EQO Council

Studies have also been carried out for four broader themes within the EQO-system

Future studies	Environmental Quality Objective	Responsible authority
Studies listed above	Natural environment	EPA
'Kulturarv ger livskraft: Hållbar utveckling ur ett humanistiskt och historiskt perspektiv — Fördjupad omvärldsanalys för kulturmiljöområdet' (Cultural heritage provides vital force/vitality: Sustainable development from a humanities and historical perspective — In-depth contemporary social and environmental analysis in the field of cultural history) (2005)	Cultural environment	National Heritage Board
'Framtidens tillsyn: Fyra olika scenarier från lokalsamhälle till EU' (Future surveillance: Four different scenarios, from local society to EU) (2004), 'Socialstyrelsens omvärldsrapport 2005' (National Board of Health and Welfare global report 2005)	Human health	National Board of Health and Welfare
See Table 1, e.g. objectives 13, 14 and 15	Land-use planning and wise management of land, water and buildings	National Board of Housing, Building and Planning

Source: Gunnarsson, Höjer and Dreborg, 2006, Att använda scenarier — förslag till långsiktigt miljömålsarbete, Miljöstrategisk analys — KTH, 2006.

Parliamentary Commission. Making the government responsible for the milestones is thought to increase the flexibility in the system. Under the previous system, decisions on the interim targets were the responsibility of the parliament. This has meant that it has been difficult to add new interim targets or remove those that for various reasons are no longer relevant.

An a*dvisory group*, consisting of representatives of the heads of a number of governmental authorities involved in the EQO system, will be established to function as a sounding board for the environment minister.

The parliament will have responsibility for deciding on the environmental quality objectives plus the 'generation target' as this is considered to give weight and stability to the system and create the necessary prerequisites for long-term planning and give clear signals for what societal changes need to take place (see further discussion on the generation target, Section 4.3).

The Swedish EPA will be responsible for coordinating the follow-up on the EQOs, including the development of forecasts/criteria to be used for these assessments. The Swedish EPA will also be responsible for the regular reporting to the government and for developing and maintaining an authority-wide platform for developing impact assessments. The platform will function as a support in the EQO system for both the authorities and the Parliamentary Commission.

A broad spectrum of *associated experts* from across national and regional authorities, municipalities, business, researchers, non-governmental organisations will be invited as associated experts.

Independent and targeted *evaluations* of the policies and measures developed as well as of the authorities' performance will be undertaken at regular intervals.

Taken altogether, the recent and ongoing structural changes are also expected to result in increased possibilities for different stakeholders such as

Box 1 Regeringens proposition/ Government bill 2009/10:155

The government bill described in this report was approved by the Swedish Parliament on 22 June 2010. All the proposals put forward were adopted.

As proposed by the bill, the Environmental Quality Objectives Council was subsequently closed down and instead a parliamentary committee has been established.

On 1 July 2010, Committee Directive 2010: 74 was issued which outlines the tasks ahead for the Parliamentary Committee. According to the Directive, the Committee shall, no later than 31 December 2010, present an action plan for the work ahead.

The Directive also states that the overall mission of the Committee will be to develop strategies, with milestones, policies and measures within the government priorities and that the work shall be undertaken in close collaboration with industry, non-profit organisations, municipalities and authorities.

The Directive also states that the work will require impact assessments and cost estimates of proposals. In addition, proposals should be accompanied by socio-economic impact analysis as well as analysis of cost proposals. The proposals shall also include assessments of alternative actions plans.

The overall mandate for the Committee is valid until 2020. During this period, the Committee will receive additional directives in accordance with government priorities. The work of the Committee will be evaluated in 2015.

The first task of the Committee is to develop and put forward an action plan for how the strategies and milestones should be developed and, if sufficient grounds exist, to propose milestones. The action plan shall be presented no later than 31 December 2010.

Committee Directive (Dir: 2010:74) (in Swedish) (http://www.sweden.gov.se/content/1/c6/14/92/72/0e088f9f.pdf)

Table 3 Resource allocation for the Institute for Future Studies

Programme	Established	Resources
Institute for Future Studies	1987 onwards	About six staff members in the IFS secretariat About 50 researchers work on IFS projects

non-governmental organisations, the private sector and research community to participate in the work on the EQOs.

The Inquiry put forward in September 2009 also suggested that 'All government agencies involved in the environmental objectives system — lead agencies for individual objectives, agencies with special sectoral responsibility and county administrative boards — should have a clearer responsibility, set out in their standing instructions, to promote progress towards the objectives in their spheres of activity' ([11]).

2.2 Resources, staffing involved

As noted, Sweden's many government bodies carry out a wide variety of futures-oriented studies, many on an ad hoc basis. For this reason, it is difficult to make an overall estimate of the resources used for futures-oriented studies. Nonetheless, this is an important activity in Sweden; one indicator is the staffing of the independent, public Institute for Future Studies (Table 3).

Within the fields of environmental policy and research, the resources and staffing for future studies is difficult to determine. One measure is that the Environmental Objectives Council spend over EUR 0.5 million a year on its evaluation work: futures studies provide an important input to the evaluations, but the specific share is not available (Table 4).

The proposals put forward and adopted through the government bill in June 2010, as described above, are leading to substantial changes in the institutional structure. It has not been possible to assess what this will mean in monetary terms but, according to Pirjo Körsén, the Parliamentary Committee is thought to have five staff ([12]). The bill further suggested that reporting should be done at the same intervals as previously.

2.3 Stakeholders and external relationships

Sweden and other Nordic cultures have an egalitarian form of management and governance, and this is reflected in the mechanisms for participation incorporated into the country's major futures studies on the environment. Participation typically involves representatives from a broad range of national government bodies and from key

Table 4 Resource allocation for the Environmental Quality Objectives Council

Programme	Established	Resources
Environmental Objectives Council	2002–June 2010	The Environmental Objectives Council coordinating the EQOs had a budget of SEK 27 million (about EUR 2.5 million). One of the main tasks of the Council was to produce an in-depth evaluation every four years: about SEK 6 million (about EUR 570 000) per year are used for this. Around 20–50 people worked on each EQO, of which there are 16.

([11]) *Sweden's Environmental Objectives — New Perspectives* (SOU 2009:83), p. 6.
([12]) Interview, Pirjo Körsén, 25 May 2010.

stakeholder groups such local government, industry, agriculture and environmental NGOs. For example, in the work to prepare the study *Sweden in the Year 2021,* representatives participated in 10 sectoral groups that played a key role in formulating future visions (Box 2).

A participative process is also embedded in the Environmental Quality Objectives and the Environmental Objectives Council was made of representatives from a broad array of stakeholders. Moreover, much of the work has been carried out on the basis of the individual objectives; here, additional stakeholders within the particular field have been involved. Moreover, responsibility for individual EQOs has been spread across seven government agencies. The policy impact covers more than just to the policy related to environment. An example of such impact is the EQO 'A well-built environment' which has been administered by the National Board of Housing, Building and Planning and the Cultural Environment.

Box 2 Consultative mechanisms for Sweden in the year 2021

The study comprised 10 projects, each focusing on a different economic sector and each with its own team and consultative group. There were 20–40 participants in each consultative group, including officials from government agencies and other public authorities, practitioners and researchers. The participants were selected by the project board after a broad invitation to interest groups, practitioners and researchers.

The methodology used in the study was backcasting: a desired future for 2021 was identified and the study identified a scenario with a pathway to this future. The study used an iterative process, described in the following stages of work.

1. Long-term environmental goals were developed by the EPA on the basis of scientific expertise.
2. The long-term environmental goals were used as a starting point for the work of the consultative groups of stakeholders: for each sector, these groups outlined scenarios of a desired future of a certain sector in the year 2021.
3. The many sector scenarios were merged into two broader visions, two different strategic scenarios of Sweden in 2021. These visions, in many ways, were opposites in terms of infrastructure choices, technical solutions and use of energy and materials.
4. A consequence analysis was made in which the two visions were assessed against two key questions: Is this plausible in Sweden? Is this plausible concerning the global impacts and developments? The consequence analysis here used four global environmental scenarios. Economical and social factors were also included — for example, to understand questions such as: Is it possible for a farmer to survive in this future scenario?
5. After the visions were analysed in terms of consequence analysis, the researchers in the project team presented the results to meetings of the stakeholder groups, outlining what they had identified as the strengths and weaknesses of the scenarios. Here, the participants were encouraged to provide further input on the scenarios, thus creating a revised, more robust scenario for each sector: this became the target picture.
6. The groups then helped to identify avenues of action to obtain the described target. These avenues were then described in detail, including economic measures, legislation and information necessary, barriers and possibilities.

In first developing sector scenarios (Step 3), the actors pictured, for example, what the future of agriculture might and should look like. Anita Linell, project leader of *Sweden in the year 2021*, stresses that the scenarios formed by different actors were sometimes extremely different from each other. This was was part of the reasoning behind creating two broad visions of the future Sweden for researchers to analyse.

The iterative process led to a good understanding among the different stakeholders and, moreover, added a learning dimension to the study. This allowed participants 'to understand that the solution one suggests is maybe not the best in all contexts, but that it works in some contexts', according to Anita Linell. For example, some participants and groups called for the use of small-scale technologies in the economy — for example, for housing infrastructure such as energy, water supply and wastewater treatment. Others believed in the value of large-scale technologies. The consequence analysis, however, showed that both approaches are needed, but in different contexts. While the small-scale technologies typically work best in sparsely populated areas, the larger-scale technologies will be needed in cities.

The changes resulting from the adoption of recent government bills are expected to lead to even stronger roles for the non-governmental organisations, the private sector and the research community and create better prerequisites for their engagement. The Swedish EPA will be responsible for all communication concerning around the EQOs and continue the practice with brief annual reports and in-depth reports every fourth year (Box 3). The next in-depth evaluation will be presented by 2012 (four years after the latest in-depth evaluation 2008).

Box 3 Communication

The website of Sweden's **Environmental Objectives Council** provides extensive information on the EQOs in both English and Swedish, including the Council's current prognosis for each objective (Table 1). The website also contains the Council's annual reports and its in-depth evaluation reports, though it does not provide links to many of the futures studies used as background for the evaluation reports.

2.4 Relative balance between quantitative versus qualitative approaches

Government bodies carry out a broad range of futures-oriented activities, and these use a variety of approaches (Section 2.1). A survey or overview of the different studies and their methodologies has not been found, however.

For the key future studies related to environmental policy, however, one key characteristic has been their methods in combining qualitative and quantitative analysis. This is the case, for example, for the study *Sweden in the Year 2021*, carried out in the 1990s. Here, quantitative methods were used at the start, in setting environment objectives; they were then reviewed by consultative groups that fleshed out draft scenarios; in the next step, a quantitative 'consequence analysis' assessed the scenarios and its results were in turn reviewed by the consultative groups (Box 2).

This approach allowed an in-depth consideration of the dynamics in different sectors and also of the interactions between different sectors. For example, new manufacturing processes might reduce demand for timber, allowing the growth of new forest; the consequence analysis studied these impacts as well as economic impacts for the forestry sector. While the analysis also looked at social consequences, here mainly qualitative methods were used as well.

The futures studies carried out for the EQO process also used a combination of qualitative (participatory) and quantitative methods. This is seen in one of the main background studies for the 2008 evaluation, a set of common scenarios used to assess achievement of objectives.

The scenarios (Figure 1) were developed using a matrix method developed in cooperation with Sweden's Royal Institute of Technology. First, a reference scenario was developed. Then, a series of four alternative scenarios were developed to identify possible different directions for the country's future. In the scenario matrix, one axis represents possible developments of Sweden's economy and society. The second axis focuses on the extent of government regulation of the economy. The scenarios developed from this axis are seen in Figure 1.

The scenarios were developed through a combination of literature reviews, contemporary social and environmental analysis and interviews. They were quantified using public forecasts for GDP, employment, energy balances and other variables and arranged in tables to compare how different factors develop in different scenarios.

After they were compiled, a workshop was arranged in which the scenarios were discussed with the authorities working on the EQOs.

The methodology was used as a foundation for all EQOs. It turned out to be quite difficult to set up scenario matrixes for all the dimensions covered by the EQOs, according to Pirjo Körsén. Therefore, the matrix was used more as a figurative model and a tool to evaluate the EQO and the need for new proposals. For each EQO, a quantitative forecast was made regarding how far it was until the EQOs could be reached.

For some EQOs, mostly qualitative forecasts were used for the forecasts. One example of an EQO that used mostly qualitative measures is 'Good quality groundwater', while the EQO for 'Clean Air' used very quantitative forecasts of air emissions and quality.

The 2008 evaluation identified a series of important problems: as noted above, many EQOs will not be met under current conditions; developments outside of Sweden will play a key role in determining whether or not they are met; and renewed efforts

Figure 1 Scenario matrix for 2008 In-depth evaluation

Anchorage

Calm, local lifestyle: shorter working hours and lower economical development: strong regions

Public regulation

A larger public role in the market, both in Sweden and globally

Anchorage/Regulation scenario

- More small-scale production
- The mix of energy contains more natural gas and biofuels, less fossil fuels
- Slightly better conditions for spreading environmentally friendly technology
- Low growth in transportation of goods, international shipping decreases substantially
- Greater area used for farming in Sweden, small-scale and extensive agriculture
- The number of private wells and small water and sewage plants increase: these are publically owned and run
- Public awareness/involvement in environmental issues is strongest regarding local and regional issues in which there is a good chance for consensus on taking powerful measures

Anchorage/Untroubled market scenario

- More small-scale production
- The energy mix is less oil but more coal
- Slow breakthrough for new environmentally friendly technology
- Low growth in transportation of goods, international shipping decreases
- Less area used for farming in Sweden, small-scale and extensive agriculture
- The number of private wells and small water and sewage plants increase: these are run by private bodies
- Public awareness/involvement in environmental issues is strongest regarding local and regional issues in which there are a good chance for consensus on taking powerful measures

Change/Regulation scenario

- More large-scale production
- The mix of energy contains more biofuels and less fossil fuels
- Good conditions for dissemination of new environmentally friendly technology
- Growth in transportation of goods and international shipping
- No increase or decrease in land used for farming in Sweden, large-scale and intense agriculture
- Vast water and sewage plants owned and run by the society
- The public are environmentally consciousness, both regarding local and global issues, which render a powerful government policy on the environment

Change/Untroubled market scenario

- More large-scale production
- The mix of energy contains more coal and nuclear power
- Breakthrough of new environmentally friendly technology only if it pays off quickly
- Growth in transportation of goods, significant increase in international shipping
- Strong decrease in land used for farming in Sweden
- Vast water and sewage plants owned and run by private actors, Swedish and international: bottled water dominates as drinking water
- If environmental issues gain attention they are pursued by consumer groups, NGOs and entrepreneurs succeeding in finding (economically) successful alternatives to environmentally depredating activities

Untroubled market

Less interference in the market, both in Sweden and globally

Change

Many possible choices and change both regarding social contacts and activities: high economic growth: big city growth

will be needed within the country. The reasons are discussed in Section 3, Analysis. Despite these problems, the evaluation concluded that the benefits of meeting Sweden's 2020 targets remain greater than the costs.

The report also contains a call for the development of new quantitative methods, in particular better models for impact assessment that could estimate costs and benefits and identify cost-effective paths.

These difficult issues have been under study in Sweden several times, including by the ad hoc Commission on Environmental Quality Objectives that presented their Inquiry to the government in September 2009.

3 Analysis

3.1 Relationship between futures programmes

Sweden has several futures programmes; moreover, many government bodies commission studies on an ad hoc basis. As a result, the relationship between different programmes and studies appears to be largely informal.

Early futures studies influenced later work: for example, the staff preparing the study on *Sweden in the Year 2021* reviewed the methods and approaches used in previous studies for the defence sector.

The *Sweden in the Year 2021* study incorporated other, ongoing futures work in the government, bringing in the results of energy scenarios from a study on the effects of an increased use of biofuels prepared by the Swedish Agency for Economic and Regional Growth ([13]).

This interaction continues in the future studies carried out for the EQOs. For example, the evaluations of the EQOs have used studies prepared by the Swedish Energy Agency forecasting energy production and use. As energy has a great impact on several EQOs (e.g. 'Climate change', 'Air quality' and 'Natural acidification') these forecasts have played an important role in the EQO work.

As noted, this study, as well as the futures work carried out for the EQOs, has involved the participation of representatives from many different government bodies and stakeholders. This suggests that there has been a diffuse exchange of information on futures work in the Swedish government.

At present, no overview appears available, though the ongoing work programme 'Future studies on futures studies' carried out by IFS may provide further details.

Box 4 Factors encouraging the use of future studies in Sweden

- A working paper by Sweden's Institute for Future Studies identifies several factors that appear to have contributed to the use of 'foresight' studies in Swedish government. (The paper defines foresight activities to include scanning, SWOT-analysis, trend analysis, futures studies and scenario construction and other activities 'trying to detect and analyse change in the surroundings of the organisation'.) These factors include:
- growth of information and knowledge available, e.g. via the Internet, and a search for ways to manage using intermediaries and analysis;
- the process of globalisation and internationalisation, which makes organisations more vulnerable to change;
- the increase in autonomy for Swedish government bodies: on the one hand, each agency or board has taken on more responsibility for its policy area and, on the other hand, these bodies follow each other's actions: 'When some government authorities rely on foresight activities, it can be seen as problematic to another not to do so'.
- Source: Lundqvist, The Emergence of Foresight Activities in Swedish Government Authorities, Institutet för Framtidsstudier/ Institute for Futures Studies, Arbetsrapport/ Working Paper 2009:5.

Lundqvist ([14]) has noted several factors that have led to the growth in the use of 'foresight' studies in Swedish government (Box 4). Lundqvist also suggests that foresight studies have become a sort of 'fashion' in Swedish government. While this study does not extend to the question of their policy implications, the observation suggests that the role of many studies may not be clearly defined.

([13]) Nutek, R., 1996:37.
([14]) Lundqvist, *The Emergence of Foresight Activities in Swedish Government Authorities*, Institutet för Framtidsstudier/Institute for Futures Studies, Arbetsrapport/Working Paper 2009:5.

One of these factors is globalisation, which has created additional uncertainty. The 2008 evaluation of the EQOs also noted the importance of external factors, arguing that these will play as important a role in terms of achieving many of the objectives as national actions. The 2008 in-depth report on the objectives concludes, 'In the process of evaluating fulfilment of environmental objectives and proposing new measures and instruments for meeting them, it is strategically important to analyse how the work is progressing in relation to probable global developments, but also to other conceivable but less probable courses of events' ([15]). Thus, within the EQO process, future studies have sought to better explore external impacts and uncertainties.

The proposals put forward by the ad hoc Commission on the Environmental Quality Objectives in September 2009 also emphasised the importance of taking external factors into consideration by enforcing a clearer international perspective to the system of the EQO. They also defined the role of the parliament, the government and the governmental agencies more precisely in 'bringing about the changes in society that need to occur within a generation' ([16]).

The government bill adopted in June 2010, put a strong focus on the issue of consumption, i.e. the realisation that a large part of what Swedish citizens consume has been imported and, thus, in many cases, has had a negative effect on the environment during the production in other countries. The bill emphasised that solving the environmental problems in Sweden should not mean that we at the same time transfer the problems to other countries.

3.2 Impact on environmental policymaking

Futures-oriented studies have had a strong influence on environmental policy in Sweden, and in particular on the development and evaluation of the Environmental Quality Objectives.

When the EPA launched the study *Sweden in the Year 2021* in 1993, it sought to use this project to help put in place the conclusions of the Rio Conference on Environment and Development (1992) and in particular the call for sustainable development that came out of Rio. In addition, the study was linked to a reform of Swedish government agencies, which made agencies take a clearer responsibility for the environment in their sector. The structure of this study brought in representatives from different agencies and its participative approach sought to help the agencies understand the environmental issues in their sector in a futures-oriented perspective.

This study is closely linked to a crucial development in Sweden's environmental policy, the environmental quality objectives (EQOs), which were agreed in 1999, the year after the study was published.

The objectives grew out of a parallel process. In 1995, Swedish Environmental Minister Anna Lindh commissioned the EPA to map existing objectives in the Swedish environmental policy and determine whether they had been achieved or not. This work reviewed many different objectives, goals and targets that had been formulated in different policies and summarised them in a series of interim reports that found about 150 objectives in various forms for Swedish environmental policy. The EQOs had a further, ambitious goal of addressing the country's major environmental problems. The work developed 15 consolidated EQOs, some with new targets, thus creating a unified structure. These were approved in 1999. In 2005, a 16th EQO on biodiversity was added.

The parallel *Sweden in the Year 2021* study influenced work on the EQOs. Moreover, it contributed directly in terms of helping to set interim targets for the EQOs. Its work in different sectors made it possible to set these interim targets for 2010. 'If one had the ambition of achieving a environmentally sustainable Sweden within a generation, how much did one have to do halfway through?' asks Anita Linell, project manager, *Sweden in the Year 2021*. And she adds that, 'It's of course important that enough is done during the first half so that one knows it is feasible to achieve the rest'.

Once the EQO system was put in place, futures studies have been used in the evaluation of progress towards these goals, in particular the major evaluations carried out every four years. Here, the EQO Council has both commissioned futures studies and drawn on studies prepared in other parts of government.

([15]) *Sweden's Environmental Objectives — No time to lose*, in-depth report 2008.
([16]) *Sweden's Environmental Objectives — New perspectives* (SOU 2009:83), p. 5.

The 2008 evaluation report (as well as the annual 2009 report) came to the uncomfortable conclusion that many of the 2020 quality objectives, as well as a number of interim targets, would not be met. There are few exceptions: for example, the target for ozone layer protection remains achievable. Thus, the future studies have identified a crucial shortcoming in the country's environmental policy.

According to officials who were involved in the process, this is in part due to the government's excessive ambitiousness in setting the EQOs. One problem is that the government and parliament decided, in 1999, to set targets that would ensure a sustainable state of the environment within a generation. A more realistic goal would have been to aim for a sustainable 'society' and allowed environmental systems to recover at their slower rate: in fact, this was the approach of the *Sweden in the Year 2021* report, but the government preferred more ambitious goals. A further problem is that some pressures on Sweden's environment come from outside the country — some are indeed global in nature — and thus are only influenced in a minor way by Swedish actions to achieve the EQOs.

In response to this problem, the government appointed the ad hoc Commission on Environmental Quality in July 2008 to evaluate the EQO system to address these issues. The outcomes of the 2009 Inquiry resulted in the government bill that was put forward in March 2010 and subsequently adopted in June 2010, through which most of the proposals put forward by the Inquiry were adopted.

The Inquiry is not a future study per se. The Inquiry and the subsequent government bill is, however, expected to have major influence on environmental policymaking in general as well as the structure of the EQO system itself and the way futures studies are undertaken within this system.

As mentioned in Section 1.1, with the approved government bill, a number of major institutional changes as well as substantial changes to the EQO system itself are being implemented, especially with regards to how the targets are formulated (Section 4.3 has further information about the targets). The adoption of the bill is likely to mean a stronger politicisation of the work under the EQO since it implies giving the government a larger responsibility for its effective implementation, plus it has lead to the establishment of a parliamentary committee that will work on direct commission from the government.

4 Conclusions

4.1 Success factors

Sweden has extensively used futures-oriented studies and these have played an important role in shaping environmental policy. Here, a series of key success factors can be seen.

Commitment

Perhaps the most important is the country's long-standing commitment to environmental protection and sustainable development. This has prompted the government to take launch futures-oriented studies and set long-term objectives to achieve these goals. Sweden's commitment prompted the *Sweden in the Year 2021* study as well as the creation of the parallel EQOs, which set long-term objectives in order to address key environmental problems within a generation. In effect, the EQOs provide the environmental pillar of Sweden's Sustainable Development objectives.

Here, the timing of the *Sweden in the Year 2021* study was crucial: the study was launched after the endorsement of Agenda 21 at the 1992 Rio Conference on Environment and Development. Agenda 21 called on the nations of the world to elaborate plans for a sustainable society in an ecological, social and economic perspective. The study was Sweden's response.

One of the most important inputs from the *Sweden in the Year 2021* project was that it showed what was possible to accomplish in one generation for each sector: these results were used to define the interim targets for 2010.

In addition, the long-term nature of the EQOs has led to a need for futures-oriented studies. Sweden has embedded futures thinking in the EQO system itself. As Pirjo Körsén puts it, 'The system is quite complicated, but it works, it actually does!'

Participation

The broad engagement of stakeholders has been an important success factor ([17]).

This has encouraged, first of all, a greater integration in policies. In the consultative groups for the study *Sweden in the Year 2021*, many stakeholders described visions of the futures they desired. By bringing together very different perspectives in the consultative groups, different stakeholders could understand and accept other visions and compromise their ideals. According to Anita Linell, 'One can't create visions without involving the ones concerned and then force them to struggle towards these visions. It's really important that the stakeholders feel that they 'own' their future targets and visions of the sectors if they shall be encouraged to try to reach them'.

The EQO system continues this approach of broad participation.

Sectoral integration

A further and related success factor is the holistic approach that Sweden took. In the *Sweden in the Year 2021* study, goals for different sectors were brought together to avoid conflicting targets. Anita Linell said, as an example, 'In the struggle to reach sustainability in the transport sector we would like to use as much bioenergy from the forests as possible. If too much is harvested the forestry won't be sustainable, however. What gains one sector may jeopardise the sustainability of another sector, which of course needs to be avoided […] the risk of too tight demarcations is that solutions that look good on your desk aren't applicable in reality.' This holistic required a broad engagement of stakeholders.

([17]) Linell, *Policy work for a sustainable society — experiences and key success factors, Sweden in the Year 2021 and Environmental Objectives* (2009), Research Materials 2009-3, *Toward Establishing a Sustainable Society*, a report of 2009 International Policy Seminar, Research and Legislative Reference Bureau, National Diet Library, Tokyo, Japan (http://www.ndl.go.jp/jp/data/publication/document/2010/200903.pdf).

The participative and holistic approach has been continued in the EQO system.

A further factor is that government bodies across different sectors have taken on responsibility for their environmental impacts.

This is related to the sustainable development approach enunciated in Agenda 21 and also to the broad participation in the study. Before, the EPA had nearly full responsibility for the environment. With the *Sweden in the Year 2021* study and the EQO system, each government agency and each sector of society in Sweden was charged by government and parliament with taking responsibility for environmental issues, thus creating a new system of shared responsibility. The sectoral agencies and stakeholders were asked to set clear goals for what they wanted to achieve within their area of responsibility. The establishment of the study in that way brought together different sectors in society (and different authorities dealing with those sectors) and created a platform that wouldn't have existed else wise.

The 2009 Inquiry also suggested that the regular follow-up on the state of environment as well as the comprehensive structure of the system itself are other major strengths of the EQO system.

4.2 Barriers to success

Many of success factors also have a darker side as they can be linked to shortcomings in overall results.

For example, the strong policy commitment led to a high level of ambition. The strong policy commitment was integrated into the backcasting technique used in the *Sweden in the Year 2021* study. Recent future studies and analysis show, that Sweden is not likely to meet most of its EQOs, but many of the interim targets can be reached. As noted, one problem is that the ambitious EQO goals did not take into account the time natural systems needed for recovery; another is that some environmental pressures occur outside the country.

Another concern is related to the strong role of agencies in Swedish government. The studies and the EQOs carried out by the independent agencies have identified ambitious environmental objective that require difficult political choices — and it appears that the political level has not taken sufficient steps towards these goals. This may reflect a lack of 'ownership' at the ministerial level and also the political level, as seen by the fact that the EQOs were endorsed by parliament in a resolution that was not legally binding.

The high level of participation across government bodies and with stakeholders has created a complex system.

For example, while Sweden has gone far in integrating sectors into futures-oriented studies, this has proved more difficult than expected. An evaluation of the project noted that preparations for the work could have been stronger. Indeed, the organisation of *Sweden in the Year 2021* had to change during the work of the project. A key problem is that the cross-fertilisation of the different sector projects didn't work as well as planned. The reasons included the new methodological approach that was used as well as the fact that institutional changes (greater environmental responsibilities for sectoral agencies) came at the same time as the futures work and thus were new. While these and other actors wanted to participate in the project, the EPA had faced some internal uncertainties regarding the project and its organisation.

The evaluation concludes that a more stringent organisation structure would have been better. The planning of the working groups and consultative groups worked out well but there were no procedures for the quality assurance of the project process with the Swedish EPA when the study was prepared ([18]).

Several other barriers have been identified: the turnover of people working in the projects, this kind of work needs continuity, it's important to be able to continue when new people constantly enter the system.

Finally, while Sweden has gone far in terms of using futures-oriented studies, one participant has commented that government bodies and agencies can still improve their futures 'thinking': for example, requests for studies could be more incisive, as could be the and its use of study results.

The 2009 Inquiry suggested that there have been a number of other barriers to success, such as that the purpose of the system, in some respects, has been unclear and that the system has been more directed 'to follow-up than implementation'. They also

([18]) Naturvårdsverket, 2005.

suggested that there has been too much focus on the authorities and that 'stakeholders outside central government' ([19]) have had difficulties finding their roles within the system. Lastly, they also point to the fact that the international interdependence has made it more difficult to reach the objectives through national measures only.

4.3 Responding to the identified barriers to success — EQOs with sustained level of ambition

The 2009 Inquiry aimed at responding to the barriers identified. In most cases, the proposals originating from the Inquiry were brought forward in the government bill.

The government bill adopted in June 2010 proposes that the high level of ambition around the EQOs is kept but that the goals should not be formulated so that they become impossible to reach. Instead, the bill proposes that the basis for the assessments be revised such that the goals become more realistic. It is proposed to achieve this partly by giving due consideration to the fact that the nature requires a long time to recover. According to Anita Linell, this was proposed to be reflected in the targets already when the EQO system was first initiated. At that point in time however, the government preferred a more ambitious target as mentioned in Section 3.2 ([20]).

Due consideration shall also be given to Sweden's international dependence and the fact that Sweden does not have control over all the policies and measures that need to be implemented at the international level in order for the EQOs to be reached. The bill further emphasises that the work to solve the major environmental problems within a generation, must not mean that we simply transfer the environmental problem to other countries (i.e. consumption perspective) as a result of our increased consumption and import from other countries.

With the adoption of the government bill, the structure of objectives for the environmental work will be revised as follows ([21]):

- *a generation target* which sets the direction for the societal transformation that needs to be done within a generation in order to reach the objectives;
- *environmental quality objectives* which indicates the state in the Swedish environment the environmental work will lead to (used to say 'will aim to');
- *milestones which outline the step* on the way to reaching the environmental quality objectives and the generation target (it is *suggested* that the so-called interim targets are dropped).

As mentioned in Section 1, the EQOs were created with the goal of implementing measures to resolve the country's major environmental problems by 2020, i.e. 'within a generation'. This was perceived as an important goal but the generation goal, in reality, has never had any obvious position in the EQO structure.

The Inquiry suggested that the generation goal has a more prominent position and function in the EQO system and that the target year should be revised to 2025 instead of 2020, as this was suggested to be more in line with what is normally regarded as one generation. The Inquiry also suggested that the generation target be put in second place in the goal structure. As demonstrated above, however, the government bill suggested that the generation goal be put in first place. It was also proposed that since the 2020 goal has developed into some kind of practice, this goal ought to be maintained.

As outlined in Section 2.1.1, the lack of 'ownership' at the ministerial level and also the political level is considered to be addressed through the new institutional structure where the government will get a larger responsibility plus through the establishment of the Parliamentary Commission. The weak quality assurance control is proposed to be addressed through the institution of regulation evaluations.

All together, these changes are thought to lead to substantial improvements to the system and lead to a more realistic level for reaching the EQO as well as assessing whether the EQO will be met or not.

([19]) *Sweden's Environmental Objectives — New perspectives* (2009), Report of the Inquiry on the Environmental Objectives System, Swedish Government Inquiries, SOU 2009:83, p. 9.
([20]) Anita Linell, interview, 29 April 2010.
([21]) Regeringskansliet (2009), Svenska miljömål — för ett effektivare miljöarbete (Swedish Environmental Objectives — for more effective environmental work), Regeringens proposition/Government Bill 2009/10:155, p. 17.

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Appendix 1
Approaches to futures studies

Country: Sweden		
Title of futures programme(s):		Sweden in the Year 2021 project Environmental Quality Objectives programme
1. Overall governance culture of country	***Description***	Sweden is a constitutional monarchy based on a parliamentary democracy and is classified as a unitary state. The legislative powers are held by the Swedish parliament *(Riksdag)*. Proposals for new laws are presented by the government which also implements legislative decisions taken by the Riksdag. The government is assisted in its work by the government offices, comprising a number of ministries, and some 300 central government agencies and public administrations. The government agencies act independently to carry out the policies of the Swedish Government. The government ministries are relatively small and are policymaking organisations; agencies implement their policy decisions but ministries do not make direct orders. Sweden is divided into 21 counties. Political tasks at this level are undertaken, on the one hand, by the county councils, whose decision-makers are directly elected by the people of the county and, on the other, by the county administrative boards which are government bodies in the counties. Some public authorities also operate at regional and local levels, for example through county boards. Sweden has 290 municipalities. Each municipality has an elected assembly, the municipal council, which takes decisions on municipal matters. The municipal council appoints the municipal executive board, which leads and coordinates municipality work. The environmental policy of Sweden is set by the Ministry of Environment with the input from the Swedish EPA and by sectoral authorities (e.g. Swedish Energy Agency). The organisation of public authorities in Sweden is, compared to other countries, relatively non-hierarchical. There is an extensive tradition of cooperation among government agencies in the Nordic region. The style of governance in Sweden reflects the Nordic cultural tradition as described in Perlitz and Seger (2004).
	Nature of futures organisation(s)	The *Sweden in the Year 2021* study was the country's biggest futures-related project. On the initiative of the Swedish EPA, the *Sweden in the Year 2021* programme was launched in January 1993 and finished five years later in 1998. The aim was to accomplish an inter-sectoral and interdisciplinary study for the purpose of identifying environmentally sustainable futures for Sweden. The ensuring project was characterised by the facts that: • a system analytical approach was used in a comprehensive research and investigative task within a public authority: this was an interdisciplinary project with a focus on natural and social-scientific issues; • a large number of actors — researchers, public servants and representatives of various sectors in society — were engaged in the project: all in all, some 300 people took part in the work (Linell, 2004). Set up through the input of *Sweden in the Year 2021*, the most important use of future studies in Sweden today is within the framework of the Environmental Quality Objectives (EQOs).

Country: Sweden		
		There are 16 EQOs adopted by the parliament. They define the state of environment that environmental policy aims to achieve before the target date 2020 (2050 for climate change) and provide a coherent framework for environmental programmes and initiatives at national, regional and local level. The Environmental Quality Objectives are: 1. Reduced climate impact 2. Clean air 3. Natural acidification only 4. A non-toxic environment 5. A protective ozone layer 6. A safe radiation environment 7. Zero eutrophication 8. Flourishing lakes and streams 9. Good quality groundwater 10. A balanced marine environment, flourishing coastal areas and archipelagos 11. Thriving wetlands 12. Sustainable forests 13. A varied agricultural landscape 14. A MAGNIFICENT MOUNTAIN Landscape 15. A well-built environment 16. A rich diversity of plant and animal life. The instruments used to achieve the EQOs are a broad raft of policy instruments, not least economic ones, e.g. the energy and carbon dioxide tax. The Environmental Code is the principal legal instrument for attaining the objectives, and the objectives themselves provide guidance when it comes to applying the Code. Other important instruments include information and voluntary agreements and dialogue between government and trade and industry. Progress towards the environmental objectives is being monitored and evaluated on an ongoing basis. Scenarios are created to calculate whether it's possible to meet the objectives. The Swedish Parliament has set a number of interim targets. These indicate the direction and timescale of the action to be taken. In January 2002, the Swedish Government established the Environmental Objectives Council (Miljömålsrådet) to promote consultation and cooperation in implementing the environmental quality objectives adopted by parliament. The Council consists of representatives of central government agencies, county administrative boards, local authorities, non-governmental organisations and the business sector. The agencies represented on the Council are: • EPA • Swedish Radiation Safety Authority • Swedish Chemicals Agency (KemI) • Geological Survey of Sweden (SGU) • Swedish Forest Agency • Swedish Board of Agriculture • Swedish National Institute of Public Health • National Board of Housing, Building and Planning • Swedish National Heritage Board • National Board of Health and Welfare. The Council is served by a Secretariat based at the Swedish Environmental Protection Agency. The principal functions of the Council are: • to monitor and evaluate progress towards the environmental objectives; • to report to the government on how efforts to achieve the objectives are advancing and what further action is required; • to coordinate the information efforts of responsible authorities; • to ensure coordination of the regional application of the objectives; • to allocate funding for monitoring of progress towards the objectives, environmental monitoring, and reporting at international level.

Country: Sweden		
		Every fourth year, the Council provides the Swedish Government with a report in which it (using the expertise of its representatives) forecasts the likelihood of reaching the EQOs including in-depth evaluation on progress being made and the necessary action to be taken.
	Date programme(s) introduced	The *Sweden in the Year 2021* project ran for five years, 1993–1998. The Environmental Quality Objectives were set up in 1999 and under the original plans were intended to finish in 2020 (2050 for climate change).
	Responsibility	*Sweden in the Year 2021* was initiated by the Swedish EPA and carried out with the involvement of numerous authorities and stakeholders. The Environmental Quality Objectives were established by the government and approved by the parliament. The Environmental Objectives Council coordinated the tasks within the programme, with the main work conducted by the specific authorities responsible for the EQOs. Every year, a prognosis of the likelihood of reaching the objectives to 2020 is made. Scenario work has been undertaken once for each EQO and for the programme as a whole within the in-depth evaluations that are produced by the Environmental Objectives Council. The most recent in-depth evaluation was prepared in 2008.
	Resources	*Sweden in the Year 2021* A large number of actors — researchers, public servants and representatives of various sectors in society — were engaged in the project. All in all, some 300 people took part in the work. The budget for the project was SEK 1–2 million (about EUR 95–180 000). *The Environmental Quality Objectives* 20–50 persons work on each EQO, of which there are 16. The Environmental Objectives Council has a budget of SEK 27 million (about EUR 2.5 million) though much of the work is carried out by other government bodies. One of the Council's major tasks is to produce an in-depth evaluation every four years, which is budgeted at about SEK 6 million per year (about EUR 570 000), mainly for administration.
	Tradition	*Sweden in the Year 2021* was a one-off project, though it is directly linked to the development of the EQOs. The Environmental Quality Objectives should be reached by the year 2020. However, the system works as a 'follow-up mill': evaluate — follow up — take new measures every fourth year. Discussions suggest that after 2020, this work should continue. Pirjo Körsén notes that, 'We don't know what the coming governments will do — but the aim of the EQO projects is that they are long term. Right now, the EQOs are set to last/be achieved until/by 2020 and 2050 for the climate change objective. However, it is likely that several other objectives will be extended to 2050 as well since ecosystems take a longer time to recover than 2020. Right now, it is only discussed in terms of whether an EQO is seen as achieved or not. So far it hasn't really been clarified.' Pirjo Körsén adds, 'I think everyone agrees that more work is needed to be done after 2020. The environmental problems we have today might look completely different in 10–15 years.'
	Parliament	There is no specific body for futures studies in the Swedish parliament, the Sveriges riksdag.
	Advisory councils	The Environmental Objectives Council brings together stakeholders: its membership includes representatives of different government bodies at national and local levels as well as non-governmental organisations and the business sector.
	Legal framework	The Environmental Quality Objectives and their interim targets and indicators are adopted by the government and parliament. While there is no requirement specifically regarding long-term analysis, effectively it is in place as the EQO Council should regularly evaluate progress towards these long-term goals.
	Political framework	The Environmental Quality Objectives is a political framework which forms a central part of the government's environmental policy.

Country: Sweden		
	Role of environmental research/ foresight programmes in providing futures thinking	The scenario making within the Environmental Quality Objectives-framework is the most important use of futures thinking in the environmental field in Sweden. The *Sweden in the Year 2021* project showed that it was possible to close in on/approach sustainable sectors of society within a generation and from these results interim targets could be formulated.
	Actors	The EQOs involves 10 government agencies (seven with direct responsibility over one or more EQOs) but there is also other futures-related work in fields other than the environment conducted by the Swedish Government. The Ministry of Defence and its research organisation have long used scenarios and prognosis to decide on how to approach the surrounding world. Main environmental actors for both initiatives are as follows: The government ministries of Sweden are relatively small and merely policymaking organisations, allocated controlling agencies by policy decisions but not by direct orders. In Sweden, the government agencies act independently to carry out the policies of the Swedish Government. **The Ministry of the Environment** The Ministry of the Environment has several divisions, which take care of ongoing work, including preparation of government decisions. The implementation of decisions is generally entrusted to the agencies reporting to the ministry. *Division for Environmental Quality* This division coordinates the ministry's work on Sweden's environmental quality objectives and the integrated statement of environmental policy. This work includes issues relating to environmental monitoring and the setting of environmental quality standards ([22]). **The Swedish Environmental Protection Agency (SEPA)** SEPA Coordinates and promotes environmental work at national level, in the EU and at international level. The agency produces and communicates knowledge in the field of the environment, drafts proposals for objectives, action strategies and policy instruments in environmental policy and implements environmental policy decisions. *Environmental Assessment Department* The Environmental Assessment Department (EAD) is responsible for the EPA's work collecting and building knowledge on the state of the environment, on the impacts to which it is exposed and on the possible consequences of these impacts. It also coordinates international reporting. The **Environmental Quality Objectives Council secretariat** within the department is in charge of overall coordination of follow-up, evaluation and information provision in relation to the national environmental quality objectives. Unit for Environmental Impacts The Environmental Impacts Unit under the EAD is responsible for analyses, evaluations and forecasts regarding the impacts on and the state of human health and the environment. Its work includes the development of materials enabling a more detailed evaluation of four of the Environmental Quality Objectives: 'Clean air', 'Natural acidification only', 'Zero eutrophication', and 'A protective ozone layer'.

([22]) Another part of the division's role is responsibility for Sweden's participation in the global climate negotiations and for work in the EU to meet its commitments under the Kyoto Protocol. The division is also responsible for emissions trading, flexible mechanisms and other climate policy instruments, and the impact of energy production, industry and traffic on the climate and air quality. Environment-oriented education and strategic research issues also belong to the division, as do matters concerning research on sustainable development. Nuclear safety, radiation protection and management of radioactive waste are further responsibilities.

Country: Sweden		
		Climate Change Department The Climate Change Department (CCD) has overall responsibility for the Swedish EPA's work relating to the climate objective, for the development of policy instruments and tools to achieve an ecologically sustainable development and for evaluations of environmental activities. This work includes the promotion of development towards more sustainable patterns of production and consumption and more efficient energy use and transport. Climate Unit The Climate Unit under the CCD coordinates the Swedish EPA's work in the climate field and is responsible for the environmental quality objective of Reduced climate impact, as well as for the follow-up of the Swedish climate strategy. It is responsible for the Swedish EPA's work on emissions trading and prepares matters ahead of decisions by the Council for Emissions Trading Allocations. The unit is also responsible for the involvement of the Swedish EPA in international climate negotiations. It evaluates and develops policy instruments in the climate field and coordinates the Swedish EPA's work as regards adaptation measures. **The Environmental Objectives Council** In January 2002, the Swedish Government established the Environmental Objectives Council (Miljömålsrådet) to promote consultation and cooperation in implementing the environmental quality objectives adopted by Parliament. The Council consists of representatives of central government agencies, county administrative boards, local authorities, non-governmental organisations and the business sector. The Council is served by a secretariat based at the Swedish Environmental Protection Agency. The agencies represented on the Council are: • EPA • Swedish Radiation Safety Authority • Swedish Chemicals Agency (KemI) • Geological Survey of Sweden (SGU) • Swedish Forest Agency • Swedish Board of Agriculture • National Board of Housing, Building and Planning • Swedish National Institute of Public Health • Swedish National Heritage Board • National Board of Health and Welfare. The principal functions of the Council are: • to monitor and evaluate progress towards the environmental objectives; • to report to the government on how efforts to achieve the objectives are advancing and what further action is required; • to coordinate the information efforts of responsible authorities; • to ensure coordination of the regional application of the objectives; • to allocate funding for monitoring of progress towards the objectives, environmental monitoring, and reporting at international level. Each year, the Environmental Objectives Council submits a report to the Swedish Government on how efforts to achieve the country's 16 environmental quality objectives and the 72 interim targets associated with them are progressing. The Council's forecasts for these different goals, i.e. of the prospects of reaching them within the defined time frames. Every fourth year, the Council provides the Swedish Government with a more comprehensive in-depth report evaluating the prospects of achieving the environmental goals on time. In the reports, the Council proposes a wide range of instruments and measures, affecting all policy areas and new and revised interim targets are put forward, also the costs and benefits to society of meeting the objectives are described.

Country: Sweden		
	Perceived institutional need	The EQO Council helps to coordinate work on the objectives among different government bodies as well as with outside stakeholders; moreover, it provides broad representation for the regular evaluations of progress towards the objectives.
2. Institutional structure for environmental policymaking	***Relevant government departments, ministers, agencies, etc.***	The study Sweden in the Year 2021 played a major role in shaping Sweden's EQOs and especially the interim targets, which are a central element of the country's environmental policy. The study thus had a major impact on government as a whole, as well as on parliamentary discussions. The futures work undertaken for the EQO Council is linked to the regular evaluations of the objectives and, thus, in turn, to policy for the environment as well as many other sectors (e.g. agriculture, energy).
3. Foresight/ scenario culture traditions	***Approach to futures thinking***	*Sweden in the Year 2021: backcasting* The methodology used in the study was 'backcasting', meaning that a desired future scenario is created first. Based on that scenario, an analysis was made of how to get from today's situation to the desired future (and, of course, whether this is possible). The stages of the study were as follows. 1. Long-term environmental goals were developed by the EPA in collaboration with scientific expertise. One needed to know for example, how much the deposition of acidic substances must diminish for the nature to begin to recover in the long term. In that way, the acceptable impact can be calculated. 2. With the long-term environmental goals in mind, consultative groups outlined scenarios of how they pictured the future for each specific sector in the year 2021. 3. The many smaller scenarios were merged into two broader visions. These visions in many ways were opposites in terms of infrastructure choices, technical solutions and use of energy and materials. 4. A consequence analysis was made in which the two visions were assessed against four different global environmental scenarios. Economical and social factors were also included: 'Is it possible for a farmer to survive in this future scenario?' 5. The creation of a new, robust future scenario for each sector was proposed (the target picture). 6. Avenues of action to obtain the desired target were described, including economical measures, legislation and information needed, barriers and possibilities. The study used the backcasting methodology rather than conventional methods describing the most probable future as a way to remove constraints on participants. Environmental Quality Objectives: several techniques Futures studies have primarily been used at several stages of the programme, 1. Setting up the EQOs: The *Sweden in the Year 2021* study fed into the development of the country's environmental quality objectives, by providing a sense of what could be achieved, even if the EQO was deliberately optimistic. 2. Setting up interim targets: While futures thinking had a role in developing the long-term (2020) objectives, it played an even greater role in shaping the interim (mainly 2010) targets. 3. Input on measures to reach the targets: The *Sweden in the Year 2021* study in particular provided ideas on possible national and global events in the upcoming 20 years and their effects in terms of reaching the objectives. This analysis in turn helped to identify the measures needed to reach targets and to face upcoming challenges. 4. Monitoring the progress towards achieving the EQO and Evaluating whether the EQOs can be achieved at all (with possible measures): For some EQOs, these assessments are harder than for others, this also reflects the methodologies used.

Country: Sweden		
		Pirjo Körsén underlines that for some EQOs backcasting is needed because the objective seems so hard to achieve. For other EQOs, such as 'A varied agricultural landscape', maybe just a few alternative scenarios are needed […] if that happens, this could be done. And if something else happens we can do this … In that way, the scenario work with each 16 EQOs is differently challenging and has different points of departure. To construct a common scenario is, therefore, really difficult.'
	Thematic or issue	The whole *Sweden in the Year 2021* to EQO process had a sectoral focus (environment); nonetheless, linkages to other sectors (e.g. energy, agriculture, etc.) have been emphasised throughout.
4. Summary of programme(s) as a whole, including within agencies	The above sections have summarised the two main programmes. This section reviews other futures work carried on in Sweden. The following institutions have carried out futures-related research: • Institute for Futures Studies • The Swedish Environmental Research Institute, IVL • The Stockholm Environment Institute, SEI • The Royal Swedish Academy of Sciences (IVA) • The Foresight Laboratory at Örebro University. Mistra and Swedish Foundation for Strategic Research, SFF are foundations created by the government that have sponsored research in several fields, including future related research on the environment. Of futures studies carried out in Sweden, the following are representative. **The Environmental Foresight — a Swedish Challenge**, was carried out between spring 2006 and summer 2007. The project was financed by Mistra and the Swedish EPA. The Environmental Foresight was set up to examine and find answers to the question of what can be done to promote sustainable development while exploiting comparative advantages to develop the Swedish economy. The project highlights resource and environmental issues and places them in a broad, futures-oriented perspective covering both global and Swedish environmental challenges. This was done by describing the global resource flows of today and tomorrow and analysing how these affect Sweden, both environmentally and economically. By documenting Sweden's comparative advantages within innovation systems and R&D, the project tried to answer the question of where and how environmental enterprise can be developed. Another purpose of the project was to provide more opportunities for interaction between researchers, industry and government agencies, not least to initiate a dialogue on who has influence and responsibility for development within the environmental field (http://www.iva.se/upload/Verksamhet/Projekt/Miljöarbetets%20nya%20arena/miljofolder_eng.pdf). **Energy Foresight — Sweden in Europe** was completed by the Royal Swedish Academy of Engineering Sciences (IVA) in early 2003 (The Swedish Energy Agency, STEM, played an important role in its funding). The purpose was to create a foundation for a broad discussion around the possibilities and problems regarding sustainable development of energy in Sweden. The time perspective of the project is 20 years, with glimpses to 50 years ahead (http://www.iva.se/upload/Verksamhet/Projekt/Energiframsyn/upl1255-energy_foresight.pdf). **The Nordic Hydrogen Energy Foresight**, 2003–2005, was carried out as a pilot project in the area of Nordic foresight cooperation (http://www.h2foresight.info). Foresight in Nordic Innovation Systems (http://www.nordicinnovation.net/_img/nordic_foresight_forum_final_report.pdf). **Modelling the Economic Costs of Climate Policy** — Lulea University of Technology with support of Swedish EPA (http://www.naturvardsverket.se/upload/05_klimat_i_forandring/pdf/kontrollstation_2008/LTU-FR-0714-SE.pdf). **The Swedish Technology Foresight** 2003–2004 (http://www.nistep.go.jp/IC/ic030227/pdf/s3-6.pdf).	

Appendix 2
Examples of futures studies

Country: Sweden		
Futures programme(s): Sweden in the Year 2021		
1. Description/ characteristics of future study	***Examples of specific studies***	Sector-specific studies in the transport, housing and premises, water and sewage, agriculture, forestry and forest industry, basic and goods producing industry and goods/consumption
	Exploratory/ normative?	Backcasting, alternative strategic future scenarios of Sweden
	Qualitative/ quantitative?	Mostly quantitative (but with some qualitative elements)
	Thematic focus?	Broad focus on several sectors under an 'environmental' umbrella
	Specific issue focus?	Sustainable development with focus on the environmental dimension but social and economic aspects were analysed in the impact assessment of the sector scenarios
	Spatial/ temporal scale	Sweden, 1996 to 2021
	Ad hoc/ongoing established futures process?	Ad hoc, one-off study
	Sector/cross-sector-based?	Cross-sector (within the environmental sphere)
	Science-based/ multiple stakeholders?	Science-based, in combination with consultation of multiple stakeholders
2. Original purpose and application	***For what purpose?***	'[To] accomplish an intersectional and interdisciplinary study for the purpose of identifying environmentally sustainable futures for Sweden' (Linell in Olsson and Sjöstedt (eds), 2004).
	Requested by a specific entity?	The Swedish EPA
	How used?	Following its publication, the study was used to support the establishment of Sweden's Environmental Quality Objectives.
	By whom?	The Swedish government and parliament
3. Outcomes (immediate and long term)	***Where and how used in policy (if at all)***	As above

Country: Sweden		
4. Evaluation	***Any formal evaluation of effectiveness or updates***	One evaluation was made. and presented in the report 'Miljöprojektet 'Sverige år 2021' — Metoder och projekterfarenheter'. The report describes the methodology used and evaluates the project process. The evaluation discusses the purpose and goal of the project, the role of the project in and outside the organisation, the management of the project and the quality assurance.
	Success factors/drivers	Cross-sectoral approach, broad participation from government departments, major stakeholder involvement
	Barriers to success	The organisation structure was not strong enough and this showed in the need to reorganise midway through the project. More external actors wanted to participate
5. References	Naturvårdsverket: 1998, Sverige år 2021 — vägen till ett hållbart samhälle, rapport 4858. Linell, A. and Eriksson, K., 2003, Miljöprojektet 'Sverige år 2021', metod och projekterfarenheter, Naturvårdsverket, rapport 5276. Linell, 'Sweden in the year 2021 — A Systems Study of Sweden's Future Environment', Olsson and Sjöstedt (eds), 2004, *Systems approaches and their application — Examples from Sweden*, Springer Netherlands.	

Country: Sweden		
Futures programme(s): Sweden's Environmental Quality Objectives		
1. Description/ haracteristics of future study	***Examples of specific studies***	Ongoing studies within the programme *(e.g. Engström, Höjer and Dreborg, 2006, Omvärldsscenarier i miljömålsarbetet. Miljöstrategisk analys — KTH, June 2006)* Some are incorporated in the yearly reports called De facto; most futures analysis is incorporated in the in-depth evaluation published every fourth year: this review has focused on the 2008 in-depth evaluation.
	Exploratory/ normative?	A variety of techniques are used. The EQOs themselves reflect a backcasting approach. Forecasts as well as alternative future scenarios have been used in their evaluation.
	Qualitative/ quantitative?	The objectives are desired targets to achieve and the task is to assess whether these are achievable or not. In this assessment, a qualitative methodology is used for some EQO (in particular for the qualitative objectives) and a quantitative approach for others.
	Thematic focus?	Broad focus on the environment, with strong links to related sectors (agriculture, energy, industry and others): thus, the approach could be called 'sustainable development'.
	Specific issue focus?	Focus on 16 environmental themes covering the major problems.
	Spatial/ temporal scale	1999–2020 (2050 for climate change)
	Ad hoc/ongoing established futures process?	Ongoing and established process
	Sector/cross-sector-based?	Cross-sector (within the Environment scope)
	Science-based/ multiple stakeholders?	Both: multiple stakeholders on the board who decide on the proceedings of the work (EOC)
2. Original purpose and application	The overall programme objectives are as follows: 'The environmental quality objectives are designed to: • promote human health; • safeguard biodiversity and the natural environment; • preserve the cultural environment and cultural heritage; • maintain long-term ecosystem productivity; • ensure wise management of natural resources. The overall goal is that, within one generation, the major environmental problems currently facing us will have been solved. This means that all the key measures required to achieve the objectives in Sweden need to be implemented by the year 2020 (2050 in the case of the climate objective). However, it takes time for nature to recover and, in some cases, the desired quality of the environment will not be brought about on the timescale envisaged, even if vigorous action is taken.' Source: http://www.miljomal.nu/Environmental-Objectives-Portal/About-the-Environmental-Objectives/ Futures studies are used on a periodic basis to assess progress towards these goals.	
	Requested by a specific entity? The government and parliament	
	How used? Futures studies are directly linked to the evaluation of these policy objectives (and were also used in formulating the objectives).	
	By whom? The EQO Council, with representatives from across government bodies as well as NGOs and business; its secretariat is located within the Swedish EPA.	
3. Outcomes (immediate and long term)	***Where and how used in policy (if at all)***	As noted above, futures studies have a direct link to environmental policy — first in terms of setting objectives and now for the evaluation of progress.

Country: Sweden		
4. Evaluation	***Any formal evaluation of effectiveness or updates***	While futures studies are part of a policy evaluation exercise, no information was found on the evaluation of the studies themselves.
	Success factors/drivers	Futures analysis is directly linked to policy goals and their evaluation.
	Barriers to success	The turnover of people working in the projects. One expert, Pirjo Körsén, commented that, 'This kind of work needs, it's important to be able to continue when new people constantly enter the system.' Government orders regarding the preparation and use of future studies are not always clear.
5. References	http://www.miljomal.nu/Environmental-Objectives-Portal/	

Country: Sweden		
Futures programme(s): Sweden's Environmental Quality Objectives — proposed new structure from 2010 onwards		
1. Description/ characteristics of future study	***Examples of specific studies***	Annual reviews will be published and in-depth evaluations will be published every fourth year starting 2014.
	Exploratory/ normative?	A variety of techniques are expected to be used. The EQOs themselves reflect a backcasting approach. Forecasts as well as alternative future scenarios have been used in their evaluation. The parliamentary commission will regularly develop a set of alternative strategies and options for reaching the EQO by using backcasting and scenario methodologies.
	Qualitative/ quantitative?	The EQO are targets which indicate the state of the Swedish environment and what the environmental work will lead to. In assessing the targets, qualitative methodology is expected to be used for some EQOs (in particular for the qualitative objectives) and a quantitative approach for others.
	Thematic focus?	Broad focus on the environment, with strong links to related sectors (agriculture, energy, industry and others): thus, the approach could be called 'sustainable development'. Strong focus on the international dependence as well as global consumption.
	Specific issue focus?	Focus on 16 environmental themes covering the major problems.
	Spatial/ temporal scale	1999–2020 (2050 for climate change with 40 % reduction of CO^2 emissions by 2020 compared to 1990 as the milestone target)
	Ad hoc/ongoing established futures process?	Ongoing and established process
	Sector/cross-sector-based?	Cross-sector (within the Environment scope)
	Science-based/ multiple stakeholders?	Both: multiple stakeholders invited to take part in the work on the EQO
2. Original purpose and application	***For what purpose?***	The overall goal within the environmental policy is: 'To hand over a society to the next generation where the major environmental problems within Sweden have been solved, without having increased the environment and health problems outside Sweden at the same time' (the 'Generation goal'). The environmental policies should aim to ensure that: • the ecosystems have recovered, or are on the way to recovery and their capacity to maintain long-term ecosystem productivity has been ensured; • biodiversity as well as the natural environment and cultural heritage is preserved, promoted and used sustainably; • human health is exposed to minimal adverse environmental impacts while, at the same time, the positive influence of the environment on human health is promoted; • the environmental systems are resource-effective and, as far as possible, free from hazardous substances; • the management of natural resources is conscientious; • the portion renewable energy is growing and that energy usage is effective with minimal negative effects on the environment; • long-term ecosystem productivity is maintained; • the consumption patterns of goods and services has limited negative environmental and health consequences (in Sweden as well as abroad). Due recognition should be given to the fact that it takes time for nature to recover as well as to the fact that achieving many of the EQOs will be dependent on international measures. Futures studies will be used on a periodic basis to assess progress towards these goals.
	Requested by a specific entity?	The government and parliament

Country: Sweden		
	How used?	
	Future studies are directly linked to the evaluation of these policy objectives (and were also used in formulating the objectives)	
	By whom?	
	• A Parliamentary Commission with 5–8 representatives from across the political parties is commissioned by the government to be responsible for developing strategies for how the EQOs will be met; organises ad hoc working groups to develop proposals for strategies, policies and measures; gives advice to the government. • The government is responsible for taking decisions on the different milestones to the EQOs; provides regular reports to the parliament. • An advisory group consisting of the Directors-General of a number of governmental authorities is established to function as a sounding board for the Environment Minister. • The parliament is responsible for deciding on the EQOs as well as the 'Generation target'. • The Swedish EPA is responsible for coordinating the follow-up on the EQOs and for regular reporting to the government; responsible for developing and maintaining an authority-wide platform for developing impact assessments. • A broad spectrum of associated experts from national and regional authorities, municipalities, business, researchers, NGO are used associated experts. • Regular independent and targeted evaluations of the policies and measures developed, as well as the authorities' performance, will be undertaken.	
3. Outcomes (immediate and long term)	***Where and how used in policy (if at all)***	As noted above, futures studies have a direct link to environmental policy: for setting objectives; for the evaluation of progress as well as for the evaluation of alternative strategies to be followed in order to reach the EQOs.
4. Evaluation	***Any formal evaluation of effectiveness or updates***	The September 2009 Inquiry was an evaluation of the current system surrounding the EQOs and how effective this system has been in its work towards fulfilling the EQOs. While the Inquiry was part of a policy evaluation exercise, no information has been found on the evaluation of the studies themselves.
	Success factors/drivers	
	Barriers to success	The September 2009 Inquiry and the subsequent governmental bill presented in March 2010 (and adopted in June 2010) has been put forward in response to a number of barriers to success as identified within the previous system. Hence, it is too early to assess any success factors or barriers to success with the new system proposed.
5. References	*Sweden's Environmental Objectives — New perspectives* (SOU 2009:83). Svenska miljömål — för ett effektivare miljöarbete (Swedish Environmental Objectives — for more effective environmental work), Regeringens proposition 2009/10:155. Interview, Pirjo Körsen, 25 May 2010.	

European Environment Agency

Annex 11 — Sweden country case study
BLOSSOM: Support to analysis for long-term governance and institutional arrangements

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