

Comparative Review of Adaptation Strategies

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Executive Summary

A comparative analysis of 12 country and regional adaptation strategies was conducted to draw out common themes and lessons that may be relevant for Scotland in developing its Adaptation Programme. The following key points emerged:

- Adaptation strategy development seems strongest where it pulls together both central and devolved organisations' perspectives. Centralised oversight provides an overarching, national framework and strong leadership, and regional/local involvement integrates locally specific issues and increases stakeholder buy-in, which aids implementation.
- It appears that the legacy of learning from the development of the strategy can be important in terms of successful implementation, as well as for the development of subsequent versions.
- A sector-by-sector approach to risk assessment and strategy implementation is pragmatic, as it maps onto existing government structures and stakeholder groups. However, it can also encourage silo working that hinders cross-sectoral learning and the identification of synergies. For this reason, cross-sectoral (horizontal) integration is also important; though more difficult to achieve.
- National level vulnerability/risk assessment is more complex and resource-intensive than sector-by-sector assessment, and depends upon having robust sectoral and possibly regional risk assessments to build upon and a strong stakeholder engagement process.
- Adaptation strategies may benefit from giving more detailed consideration to: linkages between adaptation and mitigation policies; the treatment of international impacts; and, social justice.
- Most strategies reviewed made only cursory mention of the opportunities posed by climate change. Few identified win-win options, but those that did highlighted them as ways to help tackle uncertainty or as a means of addressing several impacts or achieving multiple goals.
- Monitoring and evaluation remains relatively poorly developed in most of the countries and regions reviewed, but the attention being paid to M&E is growing and there is an awareness of the need to draw on lesson sharing, existing scholarship and good practice in other areas.

ClimateXChange is Scotland's Centre of Expertise on Climate Change, supporting the Scottish Government's policy development on climate change mitigation, adaptation and the transition to a low carbon economy. The centre delivers objective, independent, integrated and authoritative evidence in response to clearly specified policy questions.

Table 1 - Areas of particular strength within strategies

Stakeholder engagement	Risk & vulnerability assessment	Sectoral focus	Horizontal integration	Vertical integration	Monitoring & evaluation
California	Germany	California	Atlantic Canada	Atlantic Canada	Finland
Finland	New York City	Denmark	Denmark	Denmark	
New York City	Spain	Finland	Finland	Finland	
Norway		Netherlands	Netherlands	Norway	
Spain		Norway	New York City	Spain	
		Spain			

1. Introduction

This document reports on the findings of a brief review of national and sub-national adaptation strategies. The purpose of the review is to provide insights relevant to the development of the first Scottish Adaptation Programme. It was conducted by ClimateXChange in response to a request from the Scottish Government.

The scope of the work was to consider:

- the range of approaches to strategy development;
- the particular features of strategies;
- whether and how risk assessment has been undertaken to inform the strategy;
- how strategies' effectiveness is being monitored and evaluated;
- the benefits and drawbacks of different approaches.

The following sections of this report explain the methodology used to review the strategies (Section 2) and set out the key themes emerging from the analysis of their development and implementation, use of risk and vulnerability assessments, other important features, and approaches to monitoring and evaluation (Section 3).

2. Methodology used to assess adaptation strategies

Adaptation strategies were reviewed for the following countries and sub-national regions¹ :

Atlantic Canada; Bavaria; California; Denmark; Finland; Germany; The Netherlands; New York City; New Zealand; Norway; Spain; and, Wales.

These were selected because they met one or more of the following criteria:

- *Similarities to Scotland* in terms of geography and/or climate impacts (e.g. Norway, Wales, New Zealand, Atlantic Canada);
- *Relatively well advanced* in the development and implementation of an adaptation strategy (e.g. the Netherlands, Germany, California, Norway, Finland, Spain);
- *Interesting approaches* to particular issues such as stakeholder engagement, financing, communication or devolution of decision making (e.g. Spain, Finland, New York City, Denmark, Germany and Bavaria).

Decisions on these criteria were made based on advice from the Scottish Government, information from experts and a desk review of national and regional adaptation strategies and secondary literature.

A template was developed and used to collect information about the features of each strategy according to the topics of interest to the Scottish Government. A brief review of previous analyses of national adaptation strategies also helped to inform the content of the template. Completed templates were compared and important issues identified under each topic. Telephone interviews with three adaptation experts in Europe and a further literature review were used to test emerging ideas. Further details about the methodology are available in Appendix II.

3. Analysis of adaptation strategies

3.1 Strategy Development and Implementation

3.1.1 Overview

Countries and regions have taken different approaches to strategy development. Approaches range from centralised to relatively devolved, and from sectoral to cross-sectoral. Centralised approaches have tended to involve a small group of Ministries only (e.g. Bavaria) whilst devolved approaches have engaged a wide range of state and non-state stakeholders (e.g. New York) and have also involved local government (e.g. Spain). Some strategies have a strong sector-by-sector focus (e.g. Finland and Spain).

On balance, it seems beneficial that central, devolved and sector stakeholders should be involved in the development of the strategy². This helps capture relevant knowledge from a broad range of groups and secure a sense of ownership of the strategy across the broadest range of stakeholders, helping to ensure the strategy resonates with those who will implement it. It also helps with identification of potential synergies and conflicts.

¹ Throughout this report, regions are sub-national.

² Dumollard & Leseur (2011) identified four benefits of decentralising adaptation policy at both the development and implementation stages: local-level information will be more abundant; many adaptation measures will need to be implemented at a regional or local level; many of the benefits of measures will be felt locally (and so might be financed locally); private actors may proactively adapt and this knowledge should be captured.

Generally, horizontal (cross-departmental) coordination has been more of a focus at the strategy development stage, sometimes tailing off thereafter (e.g. the Netherlands). The strategies reviewed to a greater or lesser extent all highlight the importance of cross-sectoral, cross-cutting themes. In a study of ten OECD countries' strategies, Bauer *et al* (2011) found that horizontal integration was usually strongest during strategy development whilst vertical integration (across different levels of government) tended to be more of a focus at the implementation stage.

For the strategies reviewed here, at the implementation stage, responsibility tends to be devolved to national and sectoral bodies and agencies and to regional and local authorities, and in some countries also to the general public and private sector³. Most of the countries reviewed have some sort of vertical coordination body, as well as tools to support knowledge exchange between different actors.

The benefits of devolving implementation to sectoral bodies and regional/local authorities are that this maps well onto existing departmental structures and policies and facilitates engagement with existing stakeholder groups. It also allows for an iterative process that can run at different speeds for different sectors/regions. However, a strong sectoral focus can encourage silo working that hinders cross-sectoral learning and the identification of synergies and interdependencies. It may also lead to duplication of effort between sectors or even to conflicts remaining unresolved. Most of the countries reviewed do seek to promote horizontal coordination, usually through a cross-sectoral stakeholder group.

Although it is too early to draw firm conclusions, it seems that the legacy of learning from the development of the strategy can be important in terms of successful implementation, as well as for the development of subsequent versions. This applies also to associated processes such as risk assessments and action plan development. Capturing that legacy, despite personnel changes and Departmental restructuring, therefore deserves concerted attention⁴.

3.1.2 Discussion

Strategy development

New York City's adaptation Task Force is an example of a group which has taken a broad approach to stakeholder engagement. The Task Force consists of 40 city, state and federal agencies, regional public authorities and private companies that operate, maintain or regulate critical infrastructure in the region. The New York City Panel on Climate Change (NPCC), which consists of scientists, legal, risk and insurance experts, provides a strong knowledge base that supports the Task Force in identifying climate change risks and opportunities for the City's critical infrastructure and developing coordinated adaptation strategies.

In a further example of broad vertical and horizontal stakeholder engagement, Norway used an independent expert commission to make recommendations for a refreshed national strategy. The commission worked over two years and involved a wide range of state and non-state stakeholders. This approach appears to have paid dividends in producing consensus about the framework for revising the strategy. Spain too adopted an inclusive approach to strategy development that involved national, local and non-state stakeholders and also addressed sectoral integration.

³ Denmark's strategy suggests vulnerable actors have a direct incentive to adapt and that adaptation could therefore be left to the private sector and market mechanisms (Biesbroek *et al* 2010).

⁴ Preston *et al* (2011), in a wide-ranging review of adaptation plans, also found that much adaptation planning was ad hoc and that there was often no consistent or systematic approach to lesson learning and sharing.

In the Netherlands and Germany, the approach to strategy development was more centralised. Both countries used an inter-ministerial working group that was led by a key Ministry. In the Netherlands, the ARK Programme (National Programme for Spatial Adaptation to Climate Change) was led by the Department of Housing, Spatial Planning and the Environment (VROM). As well as four central Ministries, ARK also involves the Water Boards and the local authorities association. However, after VROM was split up and reorganised as part of a wider Government restructuring, some of the centrally-driven momentum on the national strategy and action plan seems to have been lost (personal commentary from an expert). Leadership and political will appear to be important in terms of driving strategies forward, something backed up by Biesbroek *et al* (2010).

In January 2012, the Netherlands Delta Act on flood safety and freshwater supply entered into force. This establishes a Delta Programme, a national programme of actions on flooding and water management that is submitted annually for government approval. The Delta Programme seems to have superseded the national adaptation strategy, and indeed is given prominence on the Dutch page of the European Climate Adaptation Platform CLIMATE-ADAPT, which refers to the Delta Act as the legal framework for the implementation of the national adaptation strategy. The Delta Programme involves national government, provinces, municipalities and regional water boards, and receives input from the third sector and business.

In the case of Germany, strong central government leadership, with the Federal Environment Ministry providing continuity in the role, was complemented by full involvement of the Länder in the development process (two Länder share the chair of the Action Plan committee with the Ministry).

Of the countries and regions reviewed, all but one appear to have created or adapted an institutionalised coordination body to develop the strategy. New Zealand seems not to have used such a coordination body or to have prioritised stakeholder engagement. Its strategy, which takes the form of a Guidance Manual for local authorities only, was developed by the Ministry of the Environment based on a report commissioned from a consortium of consultancies and research bodies. New Zealand aside, this review supports the findings of other research, that institutionalised coordination bodies are an important feature of strategy development (Bauer *et al* 2011). But such mechanisms are different in different countries or regions, and their format and breadth of participation depend upon wider governance structures and the extent of centralisation or devolution of powers (Dumollard & Leseur 2011).

Strategy Implementation

Norway typifies the 'mainstreaming' approach to implementation across the countries and regions reviewed. Its strategy notes that action on adaptation falls to individual departments, agencies and authorities in line with their current responsibilities. The Netherlands strategy also states that responsibility for adaptation actions lies with the relevant sectoral and regional/local bodies, and sets adaptation mainstreaming as a requirement on those bodies from 2015 onwards.

However, whilst final responsibility for taking action is devolved, most of the countries and regions reviewed do seek to coordinate efforts through multi-stakeholder mechanisms. In the Netherlands, ad hoc multi-stakeholder groups are working on individual actions focused around spatial planning, water management and flooding and the Delta Programme brings together stakeholders from different governance levels. The Dutch Knowledge for Climate programme is linking researchers with practitioners in eight hotspot areas to inform implementation more widely across the Netherlands.

Atlantic Canada has a vertical (central government down to local bodies) and horizontal (cross-sectoral) coordinating group that includes non-state stakeholders, and New York has strong public and private stakeholder engagement mechanisms. Denmark's coordination forum includes municipalities and research institutions.

Spain's Coordination Commission on Climate Change Policies is a coordination and cooperation body with representation from national, regional and local level administration, which approves and adopts work programmes under the national strategy. California has a Climate Action Team and is establishing a broadly constituted Climate Adaptation Advisory Panel.

Norway established an interdepartmental coordination team headed by the Ministry of the Environment, with a secretariat at the Norwegian Directorate for Civil Protection and Emergency Planning, which disseminates information, promotes knowledge exchange, maintains a web portal and provides training targeted at local authorities. Similar tools exist elsewhere – for example, Denmark is establishing an Information Centre, which will communicate research findings and act as a one-stop-shop for information on adaptation and California and Germany have well-developed web portals for information sharing. Integral to the New York City strategy are 3 'workbooks' drawn up by the NPCC to guide stakeholders through the process of identifying climate risks, creating adaptation plans, and considering the regulatory environment as it pertains to climate adaptation.

Biesbroek *et al* (2010) found four key components of successful integration of adaptation strategies across policy: strong leadership from a central department; adaptation units in sector departments; cross-departmental units; and, 'bottom-up' input from other levels of governance. They consider policy integration and coordination to be a key outstanding challenge across the countries they assessed⁵.

3.2 Risk and Vulnerability Assessments and Prioritisation of Risks and Actions

3.2.1 Overview

Most countries whose strategies were reviewed have identified a need for improved national-level risk/vulnerability assessment. The approach seems to be pragmatic; to use what already exists and to plan to do more (e.g. Germany and California). Countries often explicitly recognise the need to learn whilst doing, and that adaptation strategy development is an iterative process founded on regular improvements in the risk or vulnerability evidence base.

The terms 'risk assessment' and 'vulnerability assessment' are often used interchangeably in strategies and supporting documentation, so it can be difficult to determine what exactly is meant by a 'vulnerability assessment' and if and how it differs from a 'risk assessment'. This notwithstanding, 'vulnerability assessments' seem more popular than 'risk assessments', perhaps because of problems in terms of capability, data availability and capacity.

To date, few countries have completed national risk/vulnerability assessments⁶, though many have begun the process and most have conducted sectoral assessments for key sectors. All the countries reviewed have compiled climate change impact information at the national level. Certain countries (e.g. New Zealand) take an explicitly devolved approach to risk assessment, promoting local and regional level assessments through national level guidance. As with strategy development there are benefits and disadvantages associated with both a national level assessment and sector-by-sector or regional-level assessments. A national level assessment allows the prioritisation of action at a national level, and appropriate allocation of resources. However, it is more complex and resource-intensive and depends upon having robust sectoral and possibly regional risk assessments

⁵ In another study, Pfenniger *et al* (2010) identify nine categories of policy needs on adaptation: inter-agency coordination; multi-level governance; mainstreaming; awareness-raising; coping with uncertainty; research needs; tools and information access; financial and human resources; and, political commitment.

⁶ Though the USA and Canada, not assessed at national level in this review, have been conducting national assessments for a number of years, and Australia, Spain and Portugal have also completed national-level assessments.

to build upon, as well as on a strong stakeholder engagement process. A wholly sectoral approach to risk assessment may miss the interactions of risks and vulnerabilities across sectors, including any possible multiplier effects or cross-sectoral risk mitigation options.

There was surprisingly little identification and prioritisation of win-win and no/low-regrets options in the strategies reviewed. This is perhaps a reflection of the fact that most of the adaptation strategies reviewed are high-level statements of principle. One might expect to see more prioritisation of such options in future iterations of strategies and in action plans, whether sectoral or national.

3.2.2 Discussion

Risk and Vulnerability Assessments

Finland recognises the need for a coordinated assessment of risk that takes an integrated look at climate, economic, environmental, health and insurance related risks and how they relate to one another. Finland also acknowledges that current understanding of how to apply risk assessments in the context of climate change in Finland is limited. The UK Climate Change Risk Assessment is cited as an example of an applied approach. The Finnish strategy has a large section detailing climate change scenarios and socio-economic scenarios, which includes economic modelling to assess the expected development of the Finnish national economy under different scenarios.

New Zealand appears to have devolved risk assessment. Risk assessments will be carried out only at local government level and potentially only on a project by project basis (i.e. to assist with decision-making about particular investments, programmes and plans). However, the process for risk assessment is set out at the national level, with best practice clearly established.

Norway conducted a sector-by-sector vulnerability assessment from 2005-2007 (through a national-level inter-departmental conference in 2005 and follow-up report in 2007). Norway's adaptation strategy focuses on reducing vulnerability and strengthening adaptive capacity. The strategy clearly states that it is the responsibility of each sector to conduct their own risk and vulnerability assessments and these were made a statutory obligation on local authorities under the national planning law (Bauer *et al* 2011).

Spain conducted a review of impacts and vulnerabilities from 2003-2005 which covered key sectors and natural systems. Subsequently, the work programme under Spain's national strategy has concluded vulnerability assessments for the water sector, coastal areas, biodiversity and forestry, with further sectoral assessments planned. A cross-sectoral indicators framework for impacts, vulnerability and adaptation is under development.

New York City is undertaking a thorough assessment of both 'vulnerability' and 'risk'. As a result of the work of the NPCC, they have adopted a strategy of "Flexible Adaptation Pathways", an iterative risk-based approach⁷. By identifying tipping points, triggers, and decision pathways the process helps determine when and how to adopt different types of adaptation measures. The process is also intended to identify interdependencies among and within infrastructure sectors and systems.

Prioritisation of risks and actions

For most of the strategies reviewed, it is not clear how risks/vulnerabilities were prioritised. The German Action Plan identifies as a central aim the need to prioritise climate risks and impacts via a cross-sectoral, consistent assessment of risks using integrated vulnerability analysis (on a cost-benefit basis) and an estimation of sectoral and regional differences in adaptive capacity. It also identifies that priority should be given to actions that can be

⁷ This was copied from the model adopted by The Greater London Authority for managing flood risk from the Thames.

monitored and that promote synergies with existing policy objectives. Bavaria also conducted a cost-benefit analysis, with reference to national measures already in place.

Norway seemed to prioritise issues where there was a consensus about vulnerability, and the independent Commission was tasked with identifying the costs to society of taking no action and the residual costs after 'optimal' adaptation. In New York City, multi-criteria and cost benefit studies are being used to analyse the economics and financing of adaptation actions.

The Netherlands attempted prioritisation at the national level in 2007. The analysis was based on stakeholder and expert input and presented a qualitative assessment focused on ranking and prioritising adaptation options along sectoral lines, and a preliminary quantitative assessment, which identified incremental costs and benefits of options. The conclusion was that integrated nature and water management and risk-based policies ranked highly, followed by policies aiming to 'climate proof' housing and infrastructure (de Bruin *et al* 2009).

Dumollard & Leseur (2011) identify five criteria by which adaptation actions are prioritised: features of the impact (magnitude, frequency etc.); level of certainty; time horizon; cost of the action; and, complementarity with other policies. The first three appear to address prioritisation of risk/vulnerability and the last two, prioritisation of actions.

Win-win and no/low regrets actions

Win-win and no regret actions are identified as priorities in the New York City strategy, which seeks to identify win-wins with near-term benefits or which meet multiple goals. This approach draws explicitly on that used in climate change mitigation, where it is used to promote strategies that simultaneously reduce emissions and costs. No-regrets options are a focus for Germany, which also promotes iterative, flexible measures and actions that allow adaptation to several impacts at the same time (Dumollard & Leseur 2011). 'Doubling up' – actions that meet multiple goals – are promoted in the Netherlands' strategy. New Zealand and New York City mention low-regrets actions as ways to help tackle uncertainty. The strategies reviewed do not tend to provide examples of win-win or low-regrets options; rather they establish the principle, to guide future decisions on measures.

California's strategy identifies 'near-term actions' and 'long-term actions'. Near-term actions are those which can be implemented with existing funding and within a very short timescale (within about a year of publication of the strategy) and long-term actions are those which will need additional state cooperation and cross-agency support.

Opportunities

Most strategies make only cursory mention of opportunities posed by climate change. However, Finland in particular appears to have a balanced coverage of opportunities and threats. Norway also has a relatively integrated approach, with particular opportunities identified and opportunities explicitly included in the remit of the independent Commission's work. Germany highlights opportunities but the relative importance of these is downplayed. Analysis by Preston *et al* (2011) supports the conclusion that opportunities are poorly covered in strategies.

3.3 Key Features of the Adaptation Strategies

3.3.1 Overview

Cross-cutting themes are identified as important in all the strategies reviewed. However, in general, it is cross-cutting **principles** – such as mainstreaming adaptation into policy planning, or integrating research into policy making – that are the focus. These principles can in fact be applied on a sector by sector basis⁸. Countries have made less progress on the actual development and implementation of cross-sector themes or actions and genuinely cross-sectoral approaches remain largely aspirational.

This review found a diversity of approaches to action planning, with no clear examples of a national, structured approach to setting actions per sector or to identifying cross-sectoral actions. There have been some attempts to do this in the countries under review, but to date they have not done this comprehensively as most are still building the evidence base of the impacts within sectors.

3.3.2 Discussion

Treatment of cross-cutting themes

Denmark, California and Germany recognise and go some way to addressing the challenge of cross-sectoral working, with Germany for example identifying certain geographical areas where cross-sectoral work is a priority.

California explicitly states that one of the aims of the strategy is to identify cross-sectoral adaptation actions. The cross-sectoral actions identified are quite broad (e.g. integrate land use planning and climate adaptation planning and improve emergency preparedness and response capacity for climate change impacts). Finland takes a similar approach.

Action Plans

The German strategy is supported by one action plan. It covers four main areas: communication/research, incentives for adaptation, Federal actions regarding land, infrastructure and buildings, and international responsibilities. The German Länder⁹ produce sectoral action plans. Finland too has sectoral action plans, though not all sectors are covered. Atlantic Canada has regional action plans. In common with its overall approach, New Zealand devolves action planning to municipalities. The Dutch action plan seems to be a 'living' document, which is being developed and up-dated by the agencies responsible. The Norwegian Commission's report and California's strategy have actions within them.

Linkages between Mitigation and Adaptation policies

Of the strategies reviewed, only Bavaria and Wales deal with both adaptation and mitigation in a single strategy. However, this does not necessarily mean that the proposals and policies set out on adaptation and on mitigation are well linked or that co-benefits and win-wins are identified.

Germany makes explicit linkages; e.g. by highlighting where conflicts/trade-offs might arise and how these might be dealt with. California's strategy notes that some mitigation is adaptive and California's Climate Action Team is looking at ways of coordinating adaptation and mitigation to ensure that synergies are exploited. Spain's overarching coordination bodies cover mitigation and adaptation. New York City's risk-based approach is

⁸ Indeed Dumollard & Leseur (2011) suggest that mainstreaming is facilitated by a sector-by-sector approach, as this ensures that within each sector, adaptation policies are integrated with existing policies. We would agree that this is indeed the case, but that, taken in isolation, such an approach is likely to miss cross-sector synergies and potential conflicts.

⁹ The Länder are the constituent states that make up the German Federation.

intended to ensure adaptation and mitigation fit into a common framework, with the relative efficacy of the ‘flexible adaptation pathways’ being influenced by investment in mitigation also.

In their study, Bauer *et al* (2011) found that the policy officials they interviewed did not prioritise the integration of adaptation and mitigation. Their interviewees tended to see adaptation and mitigation as different types of problems that called for different policy approaches.

International impacts of climate change

Of the strategies reviewed, only Finland’s addresses the indirect impacts from international climate change impacts in a comprehensive manner. Some others make brief mention of international impacts (e.g. Denmark mentions the international insurance market and Germany refers to migration) and several other strategies simply note the obligation to assist developing countries’ adaptation efforts.

Issues such as conflict, migration, food security, supply chains and human and ecosystem health, as well as opportunities such as new markets, have not been covered in any depth in the majority of strategies reviewed. Biesbroek *et al.*’s analysis (2010), bears this out. It is the opinion of the authors that international impacts is an area that would merit greater attention in strategies.

Social justice

Equity considerations are important in Scottish Government policy making. We found that equity is not generally a feature of the strategies reviewed. The association between vulnerability and social justice is raised in the Californian strategy, which identifies poor and ethnic minority communities as most vulnerable to climate impacts.

Funding of adaptation actions

Few of the strategies discuss funding sources for adaptation. Germany is perhaps the exception. The German Action Plan details the funding source and amount for most of the approximately 150 actions and projects it contains. In total, the plan identifies funding of around 2.5 billion Euro (half of which is Germany’s international adaptation commitment). The strategy also commits 75 million Euro for regional action and coordination between 2008 and 2013. Bavaria identified spending plans for two particular actions (related to forestry and flooding), and additional money for general adaptation activities. Neither the German nor Bavarian plans indicate explicitly whether funding is additional or from existing funds.

The Dutch Delta Programme is being funded by central government, through the Delta Fund which is overseen by the Ministry of Infrastructure and the Environment. The Delta Fund covers the implementation of measures and research and from 2020 is intended to disburse over 1 billion Euro a year.

Of the other strategies that mention funding, Atlantic Canada seems to aspire to develop public-private funding mechanisms. California suggests that ‘the state should eventually provide support and funding for comprehensive adaptation planning by all state agencies where significant vulnerabilities and hazards are identified’. For New York City, whilst the NPCC was initially set up by a \$350,000 grant from The Rockefeller Foundation, it is not clear how the implementation of the strategy will be funded. However, this is clearly seen as the responsibility of both public and private concerns. The Wales and New Zealand strategies make clear that new funding streams will not be available. Most of the strategies reviewed mention the need to fund research or/and highlight research that is being funded.

3.4 Monitoring and Evaluation of adaptation strategies

3.4.1 Overview

Approaches to monitoring and evaluation (M&E) of adaptation strategies do not appear well advanced, although some countries are devoting more attention to M&E now their strategies are being implemented. There are very few countries with an established (still less statutory) M&E process or formal audit exercise, and from the evidence available on what is being done to date, there appears to be a diversity of approaches to M&E.

3.4.2 Discussion

Biesbroek *et al* (2010) found that for most of the countries they assessed, approaches for evaluating strategies had yet to be defined, and that only the UK, Germany and Finland have explicitly set out timetables for revising their strategies. Preston *et al* (2011) also note that a systematic approach to M&E has yet to emerge for adaptation. These conclusions support our assessment.

Germany is reporting to parliament with its first interim report due in April 2013. It has issued a comprehensive report on adaptation indicators setting out an adaptation indicator framework based on the Driving Forces – Pressure – State – Impact-Response (DPSIR) model of indicator development. Germany plans to issue an up-date of the strategy and action plan at the end of 2014.

Finland has evaluated its first strategy and issued an evaluation report¹⁰. As part of this process it has developed and used a single indicator of adaptation¹¹ with data gathered via survey interviews by sector. The indicator assesses sectors against a five step process with each step reflecting, amongst other things, the degree of recognition of the need for adaptation, adaptation research and adaptation measures implemented. This is an interim indicator and further work will be done to develop a set of adaptation indicators to assess the next (revised) adaptation strategy. The analysis of the implementation of the strategy using the indicator revealed that most sectors were on 'step 2' of the indicator process, with climate change impacts known, sector needs well recognised and implementation of adaptation in process.

Spain has conducted two evaluations, with monitoring reports issued in 2008 and 2011 and adopted by the Coordination Commission of Climate Change Policies and (wider-membership) National Climate Council. Spain is currently developing a multi-sectoral indicator framework for assessing impacts, vulnerability and adaptation.

Atlantic Canada's strategy requires reporting to the Council of Atlantic Ministers on an annual basis. Performance measures are to be developed for each key result area identified in the strategy. Some quantitative metrics have been proposed, e.g. the number of communities that have adopted planning processes to address climate change risks, but the focus seems to be on process indicators (as opposed to outcome indicators).

For New York City, the standing expert panel (the NPCC) has advised the City on creating a multistep planning process that includes evaluation of plans and strategies and monitoring of results, however a timeline for implementation was not apparent during this review.

Norway's statutory obligation on local authorities to conduct risk and vulnerability assessments to ensure that they include adaptation in their spatial planning effectively requires LAs to report on these issues (Bauer *et al* 2011).

¹⁰ In their review of adaptation strategies, Biesbroek *et al* (2010) found that only the UK and Finland had acknowledged the need to develop quantitative indicators.

¹¹ This seems similar to the UKCIP ladder of preparedness.

The Welsh Assembly Government is required under the Climate Change Act (2008) to report to the National Assembly for Wales annually on progress against objectives, delivery of policies and programmes and future priorities.

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Appendix I - Summary of Key Features of Main Strategies Reviewed

<p>Denmark</p>	<p>Establishment of a Coordination Forum on Adaptation - to promote cross-sectoral integration.</p> <p>Establishment of an Information Centre for adaptation – to develop a Communications Strategy for the adaptation strategy.</p> <p>Establishment of a Coordination Unit for Research.</p>
<p>California</p>	<p>Coordination of adaptation and mitigation policies to ensure synergy and remove conflict - responsibility of the Climate Action Team.</p> <p>Establishment of a Climate Adaptation Advisory Committee - to identify opportunities for collaboration across government.</p> <p>Good use of a climate change web portal and strong public engagement throughout development and implementation of the strategy.</p>
<p>Atlantic Canada</p>	<p>Regional Adaptation Collaborative - to bring together sectors, public and private sector players and different professions.</p> <p>Establishment of Actual Performance Measures and suggested metrics for Key Result Areas of the strategy.</p>
<p>Finland</p>	<p>Monitoring and evaluation, including an interim indicator to measure progress in adaptation. Completed review of the first strategy and identified key challenges in the implementation of the strategy.</p> <p>Use of socio-economic scenarios and thorough analysis of sensitivities, risks, opportunities and adaptive capacities for sectors.</p> <p>Good coverage of international dimensions of climate change adaptation.</p> <p>Coordination group for climate change established.</p>
<p>Germany</p>	<p>Detailed Action Plan - which identifies clear objectives/projects, along with details of those responsible for delivery, timeline and funding arrangements (source and amount)</p> <p>Clear direction for how to prioritise actions - via a cross-sectoral, consistent assessment of risks using integrated vulnerability analysis (on a cost-benefit basis) and an estimation of sectoral and regional differences in adaptive capacity.</p> <p>Clear leadership - Federal Environment Ministry, but developed in close cooperation with the Länder by a working group comprised of representatives from most of the federal ministries.</p>

<p>New York City</p>	<p>'Win-win' opportunities - Identifies potential for actions with near-term benefits or which meet multiple goals</p> <p>Leadership and engagement- Combination of a strong leadership with, from inception, involvement of multiple layers of government and a wide range of public and private sector stakeholders and experts</p> <p>'Flexible Adaptation Pathways'- iterative climate adaptation process. Seen as an essential approach given the levels of uncertainty.</p>
<p>Norway</p>	<p>Strong engagement process - independent Commission established, involving wide range of stakeholders, to draw up green paper.</p> <p>Accessible, comprehensive web portal – principal target is LAs, but widely applicable information, maps, tools, advice, reports, training, links etc.</p>
<p>Netherlands</p>	<p>Limited focus – spatial planning and flooding/water, building on a long tradition of planning for resilience.</p> <p>Inter-ministerial process, but leadership and coordination seems to have become less strong over time. There does not appear to be a 'one stop-shop' where all adaptation activities/plans/programmes are recorded.</p> <p>Risk management (preventing and minimising damage) and restoring natural processes are two key cross-cutting principles ['Avoiding or reducing the risks', in UKCIP's terminology]</p>
<p>New Zealand</p>	<p>Very devolved approach – strategy is guidance only, advising LAs on how they can continue to meet their statutory obligations under climate change. All responsibility for decision making and action is devolved.</p>
<p>Spain</p>	<p>Strong coordination – regions have their own strategies but efforts are coordinated nationally through a well-established Commission with decision-making powers (e.g. re Work Programmes under the national and regional strategies).</p> <p>Broad stakeholder participation – through the Coordination Commission of Climate Change Policies and National Climate Council.</p>

Appendix II - Methodology

As described in Section 3, country and regional strategies were chosen for review if they had similarities to Scotland, were relatively well advanced in adaptation strategy development and/or implementation, or had taken an interesting approach to addressing adaptation.

Once the countries and regions were chosen, a template was developed and used to collect information about the features of each strategy. The template was developed to cover the key issues highlighted by the Scottish Government as being of interest to them. A brief review of literature from previous analyses of national adaptation strategies helped to inform the content of the template. The PEER Review (Swart *et al* 2009) and Biesbroek *et al* (2010) in particular were used to help refine the template. Comments on the draft template were invited from other experts and with the Scottish Government before it was finalised (see below for template structure).

Three ClimateXChange members conducted a desk review of the selected strategies using the template, with one template completed for each country or region. Completed templates were then compared in a synthesis exercise and important issues and common themes were identified under each topic.

Telephone interviews were conducted with three adaptation experts in Europe, including Roger Street of UKCIP and Stéphane Isoard at the European Climate Adaptation Platform CLIMATE-ADAPT. These interviews sought to elicit expert opinion and pointers for issues that merited further consideration.

A further literature review was used to test emerging ideas and further explore areas of interest to the Scottish Government.

The Review Template

The template comprised the following questions:

Name of strategy document
Year of publication
Source and hyperlink to document
Other useful sources of information
Why was this country/region chosen?

1. Development of the Adaptation Strategy

- 1.1 Which Ministry led the process? If it was not a Ministry, which body?
- 1.2 Was a new, separate body established to develop, or advise on the development of, the Strategy? Provide as much detail as possible about the rationale for establishing that body.
- 1.3 Is the strategy required by legislation or was its development driven by something else (e.g. manifesto/government commitment or public pressure)
- 1.4 Did existing sectoral or other plans and programmes form the basis of the Strategy, or was it drawn up 'from scratch'?

1.5 What sort of climate impacts research was used? Was new research commissioned, or was good research already available - or was it lacking but not commissioned?

1.6 Was a risk assessment done and if so was this national or regional, sectoral or economy-wide? What approach was taken (e.g. vulnerability perspective)? Has any analysis on the potential impacts (e.g. economic impacts) of the risks/opportunities has been done.

1.7 How were priorities defined? Was a scoring system used to assess magnitude of risks and if so how did this work?

1.8 Was there a stakeholder engagement and/or public consultation process? How was it managed?

1.9 How long did the planning/development phase last?

2. **Particular features of the Adaptation Strategy**

2.1 Which sectors are covered? Is there a prioritisation?

2.2 Are cross-cutting (cross-sectoral) themes explored and if so how is this done?

2.3 How is the Strategy integrated with other policy areas?

2.4 Is there an associated Action Plan? How is this organised (e.g. by sector, by Govt. Ministry)? Is there a prioritisation?

2.5 Are opportunities covered as well as threats – and if so are these tackled separately or integrated?

2.6 What legal status does the Strategy have? (What weight: statutory, policy, guidance?)

2.7 What is the Strategy's timescale (e.g. a 5-year cycle)?

2.8 Is there any regional focus (breaking the Strategy and actions down to a sub-national level)?

2.9 Is the Strategy explicitly intended to raise awareness?

2.10 Is there any cross-referencing to mitigation policy?

2.11 Does the strategy identify and prioritise 'low-regret', 'no-regret' or 'win-win' actions?

2.12 Are international impacts (i.e. indirect impacts on the country/region) taken into account?

3. **Implementation**

3.1 What implementation arrangements are established? Is responsibility devolved to local bodies (and beyond)?

3.2 What mechanisms exist for integrated working across sectors and across different levels of policy making (e.g. national, regional, local; private-public)

3.3 Are particular policy instruments identified as means of building adaptive capacity and promoting adaptive actions?

3.4 What funding mechanisms are in place? To what extent are adaptation measures directly funded (is there 'new money')?

3.5 Does the Strategy establish any methods or mechanisms for communication and information sharing with stakeholders?

3.6 Are there complementary (web) tools and services available for government (including local), the public, businesses etc.?

4. **Monitoring and Reporting**

4.1 Is there a formal evaluation process established? How regularly does monitoring occur?

4.2 Which Ministry/body has responsibility for monitoring and evaluation? Who conducts the evaluation (is it an internal governmental exercise or does an independent entity get involved)?

4.3 Is there a formal (e.g. financial or parliamentary) audit process?

4.4 What methods of evaluation are used? Which metrics – e.g. are indicators used? How far are the data used quantitative? How far can comparisons be made between sectors and between actions under Action Plans? Are there priority areas identified for evaluation? Is there a report card approach?

4.5 How is reporting done (to parliament, to the media, via websites, not at all)?

4.6 Is there a stakeholder engagement and/or public consultation process? How is it managed?

4.7 What system if any is there for making adjustments to the Strategy or Action Plans in light of evaluation reports?

5. **Overall impressions**

5.1 What are the key benefits/advantages of the Strategy and approach taken in developing it?

5.2 What are the key drawbacks of the Strategy and approach taken in developing it?