

Developing a National Climate Change Adaptation Plan (NAP) for New Zealand

Scoping Report

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Prepared by:

Andrew Tait and Juliana Ungaro

For any information regarding this report please contact:

Andrew Tait
Principal Scientist
Climate
+64-4-386 0562
andrew.tait@niwa.co.nz

National Institute of Water & Atmospheric Research Ltd
Private Bag 14901
Kilbirnie
Wellington 6241

Phone +64 4 386 0300

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	Reviewed by:	Dr Rob Bell
	Formatting checked by:	Dr Andrew Tait
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Contents

- 1 Executive Summary..... 5**
- 2 Introduction and purpose 7**
- 3 Background and UNFCCC guidance 8**
- 4 Benefits of a NAP for New Zealand 9**
- 5 New Zealand’s climate change research and information..... 10**
- 6 New Zealand’s legislative and policy context 11**
- 7 New Zealand’s progress towards developing a NAP 13**
- 8 Structure and key elements of selected NAPs 15**
 - 8.1 United States of America 15
 - 8.2 Canada 17
 - 8.3 Australia 19
 - 8.4 United Kingdom 21
 - 8.5 Ireland 23
 - 8.6 Germany 26
 - 8.7 Poland 28
 - 8.8 Denmark 30
 - 8.9 Finland 33
- 9 Commonalities of the selected NAPs 37**
- 10 Summary of key recommendations for a New Zealand NAP 38**
- 11 Questions and discussion topics for a stakeholder workshop 39**
- Appendix 1: Steps for developing National Adaptation Plans..... 40**

Figures

Figure 8-1:	US EPA’s Guiding Principles for Adaptation.	16
Figure 8-2:	US EPA’s Common Areas of Focus for Implementation Plans.	17
Figure 8-3:	Excerpt from the Canadian case study on planned relocation in Le Goulet as an option to address sea-level rise.	19
Figure 8-4:	Australia National Adaptation Strategy Infographic.	21
Figure 8-5:	Risks to the Built Environment sector in the UK.	22
Figure 8-6:	Some of the “Register of actions” for the Built Environment sector in the UK.	23
Figure 8-7:	Summary of Ireland’s Strategic National Adaptation Response.	25
Figure 8-8:	The German Climate Research Landscape.	27
Figure 8-9:	Analysis of the impact of weather phenomena in Poland and of the related losses from 2001-2011.	30
Figure 8-10:	Denmark’s three steps for adaptation to climate change.	33
Figure 8-11:	Conceptual framework of Finland’s National Strategy for Adaptation to Climate Change, 2005.	36
Figure 8-12:	Key actions, objectives and the aim of the National Climate Change Adaptation Plan 2022 (2014).	36

1 Executive Summary

The process of developing a National Adaptation Plan (NAP) for climate change was established under the 2010 Cancun Adaptation Framework. NAPs are forward-looking, holistic plans which are generally country-driven, given the local nature of adapting to climate change.

Until recently, the global focus has mainly been on assisting Least Developed Countries to develop National Adaptation Programmes of Action (NAPAs), given their vulnerability to climate change. However, NAPs have again been prioritized in 2015 through two global initiatives: the UN Sustainable Development Goals and the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement. The Sendai Framework for Disaster Risk Reduction (2015-2030) has also attempted to bridge gap between present-day disaster risk management and climate change impacts, which in the past were often treated separately.

In considering this global context, the purpose of this scoping report is to take the first steps to determine if a NAP would benefit New Zealand. A New Zealand NAP could help inform national and local governments, the private sector, and citizens of the wide-ranging impacts of climate change, and would suggest a vision and actions for building resilience to changes in our climate, so that overall New Zealand is better prepared and less susceptible to future impacts of climate change.

Possible options for the structure and various elements of a New Zealand NAP are considered, based on UNFCCC recommendations for developing a NAP and on the examination of nine existing NAPs globally (USA, Canada, Australia, United Kingdom, Ireland, Germany, Poland, Denmark, and Finland). These NAPs were selected based on their relevance and similarity to the New Zealand context.

Overall, it is recommended by the UNFCCC that countries take an approach of incorporating integrated planning, country-specific solutions, and continuity when developing NAPs. These recommendations are in line with the key finding from the desktop review of the nine national NAPs. Key recommendations for a New Zealand NAP (noting that significant progress has already been made on some of these recommendations) include:

- Ministries and local governments to develop their own separate implementation plans – following a defined framework or template, linked to the same overall goals and principles, but allowing for flexibility as necessary.
- To develop both an Adaptation Strategy (high-level) and an Action Plan (detailed level) either as separate documents or combined into one document.
- To include both urban and rural situations and considerations through climate change case studies and legislation.
- To list both existing and potential adaptation actions by key sectors and policy areas. Regional priorities may also be included in the same document.
- To focus on short-term implementable actions, which are based on longer term climate projections.

- To list key prioritized actions, with responsible parties, timeframes, resources available, and evaluation indicators described in detail.
- To have a mandate to evaluate and update the NAP on a regular basis, thus making it into a flexible, living document.
- To have any adaptation strategy or plan developed be statutory.
- To base a NAP on a comprehensive national risk assessment and prioritisation process.
- To mainstream climate change adaptation into regular activities of government so as to increase efficiency and avoid conflicting goals.
- To develop separate municipal adaptation plans for large cities.
- To develop a national research strategy for climate change adaptation in order to ensure climate change research fills the gaps in knowledge required for adaptation planning.
- To establish a coordinating body to oversee implementation and evaluation of strategies and plans.
- To develop a national web-based information portal for climate change information.
- To establish pathways for integrating climate change data and information from the science sector into a NAP and corresponding policies and actions.
- To consider international responsibilities when developing a NAP.

Based on the key findings and recommendations from this scoping report, questions and discussion topics for a stakeholder workshop are listed in the final section. The aim of this workshop would be to discuss the findings of this report, determine the benefits of developing a NAP for New Zealand, and to discuss its possible structure and fit with the statutory framework.

2 Introduction and purpose

The process of establishing a National Adaptation Plan (NAP) was established under the 2010 Cancun Adaptation Framework. It enables UNFCCC Parties to formulate and implement NAPs as a means of identifying medium- and long-term climate change adaptation needs and developing and implementing strategies and programmes to address those needs. NAPs are forward-looking, holistic plans which are generally country-driven, given the local and jurisdictional nature of adaptation.

1. The objectives of the NAP process, as stated by the UNFCCC, are: *1. To reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience; and 2. To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.*

NAPs differ from National Adaptation Programmes of Action (NAPAs) in that NAPAs use a well-defined eight-step process that results in a list of distinct climate change projects. The UNFCCC established NAPAs in 2001 to help least-developed countries (LDCs) prioritize their adaptation needs, with funding available for implementation.

Until recently, the institutional framework has mainly focused on assisting LDCs to develop NAPAs, given their vulnerability to climate change. However, NAPs have been prioritized in 2015 through two global initiatives: the 2015 UN Sustainable Development Goals (SDGs)¹ and the UNFCCC 2015 Paris Agreement². The first target under the Climate Change Sustainable Development Goal (target 13.1) aims to “strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.” Similarly, the Paris Agreement states that “each Party shall, as appropriate, engage in adaptation planning processes and the implementation of actions, including the development or enhancement of relevant plans, policies and/or contributions....” This implies that all countries that become Party to the Paris Agreement will need to develop and implement a NAP. As of January 2017, one-hundred and twenty-three countries have now ratified the Paris Agreement, including New Zealand, and it entered into force on 4th November 2016³.

The Sendai Framework for Disaster Risk Reduction (2015-2030)⁴ has also attempted to bridge gap between present-day disaster risk management and climate change impacts, which in the past were often treated separately. New Zealand is a signatory to the Framework, and has been a strong advocate for it, particularly through promoting a whole-of-society approach to disaster risk reduction.

The purpose of this document is to take the first steps to determine if a NAP would be beneficial for New Zealand and to consider possible options for its structure and various elements, based on the United Nations Framework Convention on Climate Change (UNFCCC) recommendations and analysis

¹ <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

² <https://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf>

³ <http://climateanalytics.org/hot-topics/ratification-tracker.html>

⁴ http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

of nine NAPs developed globally (USA, Canada, Australia, United Kingdom, Ireland, Germany, Poland, Denmark, and Finland).

This document provides only a brief synopsis on New Zealand climate change information sources and the legislative/policy environment, but delves deeper into examining the structure of existing NAPs from other countries, and how relevant aspects may be applicable in the NZ context.

3 Background and UNFCCC guidance

Numerous developing and developed countries have put forward Climate Change Adaptation Plans and Strategies, with a comprehensive list available at the UNFCCC website⁵. Nine NAPs were selected from this list, based on their relevance and similarity to the New Zealand context. Experiences gained from these countries, as well as from LDCs in the development of NAPAs over the past 15 years, are available to countries currently embarking on the NAP process through recommendations compiled by the LDC Expert Group.

Overall, it is recommended that countries take the following approach when developing NAPs:

- **Integrated planning:** The NAP process aims to integrate climate risk into national development planning, policies, and programs.
- **Country-specific solutions:** Countries each develop a national planning process with outputs tailored to their specific needs (and statutory frameworks).
- **Continuity:** Medium- and long-term adaptation planning is an iterative, ongoing process, not a one-time activity.

The process of developing a NAP consists of a number of steps as described in the UNFCCC's NAP Technical Guidelines; however, the elements are flexible in order to encourage governments to tailor the process as it is relevant to their country, and in the order that is deemed most appropriate. Typically, an early step in a country's NAP process is to draft a "roadmap" that specifies the scope of the NAP, the roles and responsibilities of those involved, and the sequence of planning steps for that country. Additionally, a monitoring and evaluation framework must be established early on.

An overview of the UNFCCC steps recommended for developing and implementing a NAP are described below, and are detailed in Appendix 1 (Least Developed Countries Expert Group, 2012):

1. Laying the groundwork and addressing gaps:

- a. Initiating and launching of the NAP process
- b. Stocktaking of available information
- c. Addressing any capacity gaps
- d. Assessing development needs and climate vulnerabilities

2. Preparatory elements:

- a. Analysing current and future climate change scenarios
- b. Assessing climate vulnerabilities and identifying adaptation options
- c. Reviewing and appraising adaptation options

⁵ <http://www4.unfccc.int/nap/Pages/adaptation-plans-and-strategies.aspx>

- d. Compiling and communicating national adaptation plans
- e. Integrating climate change adaptation into national and subnational development and sectorial planning

3. Implementation strategies:

- a. Prioritizing climate change adaptation in national planning
- b. Developing a long-term national adaptation implementation policy
- c. Enhancing capacity for planning and implementing adaptation policy
- d. Promoting coordination at the regional level

4. Reporting, monitoring and review:

- a. Monitoring the NAP process
- b. Reviewing the NAP process
- c. Updating the national adaptation plans
- d. Outreach on the NAP process and reporting on progress and effectiveness

4 Benefits of a NAP for New Zealand

Although adaptation is primarily a local government issue in terms of preparing for and managing the risks of climate change, central government is responsible for providing a comprehensive national vision, strategy and appropriate policy and standards. National guidance reports such as *Climate Change Projections for New Zealand (2016)*⁶, *New Zealand's Framework for Adapting to Climate Change (2014)*⁷, *Climate Change Effects and Impacts Assessment: A Guidance Manual for Local Government in New Zealand (2008)*⁸ and the forthcoming *2017 Coastal Hazards and Climate Change: A Guide for Local Government* (revision of the 2008 guidance), are all relevant for adaptation planning. However, there may still be a need for an overarching NAP that would drive and better coordinate strategic actions to build national resilience.

A national adaptation plan (or strategy) would help inform local governments and citizens of the wide-ranging impacts of climate change, and would suggest a vision and actions for building resilience, so that overall New Zealand is better prepared and less susceptible to the projected impacts of climate change. This could lead to better coordination and strategic linkages to informing and implementing Long Term Plans (LTPs) and 30-year Asset Management Plans by local government, as well as the National Infrastructure Plan.

Likely impacts of climate change include increases in extreme weather events, sea-level rise, ocean acidification, shifts in rainfall patterns (and associated hazards—flooding or droughts) and more extreme temperatures. Climatic extremes can cause national or regional damaging or disruptive events, which often cost millions of dollars from both direct and indirect impacts.

The economy of New Zealand is highly reliant on its temperate climate, and marine and terrestrial ecosystems, particularly for the tourism, agriculture, and fisheries/aquaculture sectors, all of which

⁶ <http://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/nz-climate-change-projections-final.pdf>

⁷ <http://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/nz-framework-for-adapting-to-climate-change-pdf.pdf>

⁸ <http://www.mfe.govt.nz/sites/default/files/climate-change-effect-impacts-assessment-may08.pdf>

are particularly vulnerable to climate change impacts. Approximately 30% of New Zealand's land is designated for conservation and protection under Crown Law, for the purposes of recreation, conservation, and ecological, scenic, scientific, historic or cultural reasons, all of which may be impacted by climate change.

Additionally, New Zealand has long coastlines, with many urban and economic centres, with associated infrastructure located in close proximity to the sea. This proximity means that they are increasingly vulnerable to coastal hazards such as coastal erosion, storm inundation, and rising groundwater levels, on top of rising seas (e.g., 2015 Parliamentary Commissioner for the Environment report).⁹

There are many other regional, sectoral, and cross-cutting impacts of climate change on New Zealand, which are not described in detail in this report. While there is some uncertainty in future projections and the magnitude of climate impacts, many of the costs can be avoided, reduced or even converted into opportunities with effective forward planning.

5 New Zealand's climate change research and information

The Ministry for the Environment (MfE) Climate Change website¹⁰ has a wealth of information on climate change information, for example: a) downscaled climate change projections for New Zealand, b) likely impacts across multiple sectors, c) an adaptation framework for New Zealand, and d) several case study examples of the use of climate change information to inform decision-making¹¹. The website also includes excellent summary material, guidance for local government, technical reports, and links to other New Zealand-based webpages and portals (for example, the Climate Cloud¹²) as well as links to international sites (for example, the IPCC¹³).

Furthermore, new climate change information for New Zealand, generated through such programmes as the Ministry for Primary Industry (MPI)'s Sustainable Land Management and Climate Change Research Programme (SLMACC¹⁴) and the Ministry for Business, Innovation and Employment (MBIE)'s Environmental Research Fund¹⁵, is being produced on a regular basis (see in particular, the MBIE-funded Climate Changes, Impacts and Implications¹⁶ project and the Deep South National Science Challenge¹⁷ and Resilience to Nature's Challenges¹⁸). The MfE Climate Change website is frequently updated so that it is based on the most recent national and international studies.

⁹ <http://www.pce.parliament.nz/publications/preparing-new-zealand-for-rising-seas-certainty-and-uncertainty>

¹⁰ <http://www.mfe.govt.nz/climate-change>

¹¹ The MfE webpage also has significant content on greenhouse gas monitoring and mitigation.

¹² <http://www.climatecloud.co.nz/>

¹³ <https://www.ipcc.ch/>

¹⁴ <https://www.mpi.govt.nz/funding-and-programmes/forestry/sustainable-land-management-and-climate-change-research-programme/>

¹⁵ <http://www.mbie.govt.nz/info-services/science-innovation/investment-funding/current-funding>

¹⁶ <http://ccii.org.nz/>

¹⁷ <http://www.deepsouthchallenge.co.nz/>

¹⁸ <https://resiliencechallenge.nz/Resilience-Home/Science-Programmes/Edge>

A review article on the development of coastal adaptation in New Zealand was recently published (Rouse et al., 2016¹⁹), which highlights the enablers and considerable barriers and challenges that have been encountered in the NZ context. Also, the Royal Society of New Zealand has recently produced two summary reports on climate change implications and mitigation options for New Zealand²⁰²¹.

Tools for climate change impact and adaptation assessments are available globally and for New Zealand. Many of these tools have been developed for Environmental Hazards research, but can be easily adapted to include climate change information. For example, the Climate Change and Urban Impacts Toolbox²² describes many of these tools and how they can be used in New Zealand urban environments. Other resources are readily available, for example via the U.S. Climate Resilience Toolkit²³, the new CoastAdapt tool produced by the National Climate Change Adaptation Research facility (NCCARF) in Australia²⁴, and the Dynamic Adaptive Policy Pathways approach developed by Deltares²⁵ that has been used more generically for adaptation in the water resources sector (and here in NZ for adaptation planning for flood protection for the Lower Hutt (Lawrence & Haasnoot, 2017²⁶)).

6 New Zealand’s legislative and policy context

The final element in the ‘preparatory’ steps of the UNFCCC guidance on NAP Implementation is ‘Integrating climate change adaptation into national and subnational development and sectorial planning’ (Step 2e). Progress has been made on this front already, for New Zealand – see Chapter 9 from the New Zealand Climate Change Centre (NZCCC²⁷)’s publication “Climate Change Adaptation in New Zealand”²⁸ and the information on MfE’s Climate Change website under “Roles and Responsibilities for Adapting to Climate Change”²⁹.

Lawrence et al. (2013)³⁰ reviewed the institutional practice barriers and enablers. They found a predominant use of static mechanisms that create inflexible responses to changing risks and the need for greater integration between different levels of government including better use of national policy

¹⁹ Rouse HL, Bell RG, Lundquist CJ, Blackett PE, Hicks DM, King DN. 2016. Coastal adaptation to climate change in Aotearoa-New Zealand. *New Zealand Journal of Marine and Freshwater Research* 1–40. Retrieved from <http://dx.doi.org/10.1080/00288330.2016.1185736>.

²⁰ <http://royalsociety.org.nz/expert-advice/papers/yr2016/climate-change-implications-for-new-zealand/>

²¹ <http://royalsociety.org.nz/expert-advice/papers/yr2016/mitigation-options-for-new-zealand/>

²² <https://www.niwa.co.nz/climate/urban-impacts-toolbox>

²³ <https://toolkit.climate.gov/>

²⁴ <https://www.nccarf.edu.au/content/coastal-tool-overview>

²⁵ <https://www.deltares.nl/en/adaptive-pathways/>

²⁶ Lawrence J, Haasnoot M. 2017. What it took to catalyse uptake of dynamic adaptive pathways planning to address climate change uncertainty. *Environmental Science and Policy* 68: 47-57 (Published online 13-December 2016). Retrieved from <http://dx.doi.org/10.1016/j.envsci.2016.12.003>

²⁷ Note, the NZCCC was discontinued in 2016.

²⁸

[http://www.climatecloud.co.nz/CloudLibrary/Climate%20change%20adaptation%20in%20New%20Zealand%20\(NZCCC\)%20\(A4%20low\).pdf](http://www.climatecloud.co.nz/CloudLibrary/Climate%20change%20adaptation%20in%20New%20Zealand%20(NZCCC)%20(A4%20low).pdf)

²⁹ <http://www.mfe.govt.nz/climate-change/adapting-climate-change/roles-and-responsibilities>

³⁰ Lawrence, J.; Sullivan, F.; Lash, A.; Ide, G.; Cameron, C.; McGlinchey, L. (2015). Adapting to changing climate risk by local government in New Zealand: institutional practice barriers and enablers. *Local Environment, The International Journal of Justice and Sustainability* 20(3): 298-320. <http://dx.doi.org/10.1080/13549839.2013.839643>

instruments. Models for funding transitions to more transformational change were also seen as necessary.

Key legislation and policies that prescribe the need for consideration of climate change are:

- The Resource Management Act 1991 (RMA);
- Local Government Act 2002 (LGA);
- Building Act 2004 (and associated Building Regulations and Building Code);
- Civil Defence Emergency Management Act 2002 (CDEMA) and the associated National Civil Defence Emergency Management Plan Order 2015 s. 10(12), with the next review due in 2020;
- Health Act 1956;
- National Policy Statement for Freshwater Management 2014;
- New Zealand Coastal Policy Statement 2010, and associated implementation guidance
- 30-year New Zealand Infrastructure Plan 2015;³¹

There is also abundant guidance material available from MfE and MPI, particularly on climate change projections, sea level rise and coastal impacts, flood management and climate change impacts on agriculture. Guidance materials are also available on the RMA Quality Planning Resource for Climate Change 2013.³² MfE are currently working towards a National Policy Statement (NPS) for managing natural hazards by 2018³³, which will also need to consider climate-change effects.

However, based on experience to date in New Zealand (particularly around sea-level rise and the development and implementation of coastal hazard setback zones), 'integrating climate change adaptation into national and subnational development and sectorial planning' is an extremely challenging process, particularly around community engagement. To date, many of these actions are left up to local governments to determine without an overarching national adaptation strategy. If a New Zealand NAP is developed, this implementation step will need to be a key focus to ensure effective integration (e.g. between statutory instruments, sectors, discipline practice and public & private interests) and coordination is achieved.

³¹ <http://www.infrastructure.govt.nz/plan/2015/nip-aug15.pdf>

³² <http://www.qualityplanning.org.nz/index.php/planning-tools/climate-change>

³³ http://www.mfe.govt.nz/sites/default/files/media/RMA/MFE_RMA%20Nat%20Direction_Lo-Res.pdf

7 New Zealand’s progress towards developing a NAP

It is clear from key research programmes, information, and the legislative framework that many of the elements of the UNFCCC guidance on NAP Implementation described in the previous section have already been achieved for New Zealand, or are currently being progressed. Specifically, significant progress has been made on many of the ‘preparatory’ components listed under steps 1 and 2, as described in Table 7-1.

Scientific research based on accurate data monitoring and trends, improved modelling, and better understanding of physical processes will continue globally and in New Zealand (particularly in association with the Deep South National Science Challenge³⁴, NIWA’s Strategic Investment Fund Programme on climate modelling, hazards and adaptation³⁵ and university research programmes. However, the benefits of this research will not be fully realised unless there are proven and clear pathways for effectively using this knowledge for climate change adaptation and policy development. These mechanisms for applying the research results could be described and formalised in a NAP (i.e. step 2d). In particular, a NAP could serve to clarify roles and expectations so stakeholders and citizens are clear about where responsibilities lie for coordinating and/or implementing adaptation and outlining the role of non-statutory processes and MOUs between cross-sectorial and cross-council partners in implementing both local and regional adaptation plans and strategies.

Table 7-1: Description of New Zealand’s progress towards meeting the first two preparatory steps of the UNFCCC guidance for development of a NAP.

UNFCCC Steps recommended for implementing a NAP	Already achieved in New Zealand?	Notes and examples (not exclusive)
1. Laying the groundwork and addressing gaps:		
a. Initiating and launching of the NAP process	Partially	This scoping report and associated consultation workshop; MfE’s adaptation framework
b. Stocktaking of available information	Yes	MfE website; NIWA website; MPI Climate Cloud; Climate Change and Urban Impacts Toolbox; Climate Change Impacts and Implications website
c. Addressing any capacity gaps	Yes	Climate science capability well established; high capacity to adapt to climate variability; need to establish funding/insurance models,

³⁴ <http://www.deepsouthchallenge.co.nz/>

³⁵ <https://www.niwa.co.nz/climate/research-projects/regional-modelling-of-new-zealand-climate>

		particularly for primary production that may be impacted.
d. Assessing development needs and climate vulnerabilities	Partially	Good understanding of likely impacts and vulnerabilities (e.g. PCE report on sea level rise), but gaps in knowledge, CCII reports
2. Preparatory elements:		
a. Analysing current and future climate change scenarios	Yes	Deep South National Science Challenge; NIWA Regional Climate Modelling Research Programme; Climate Change Projections for New Zealand (2016)
b. Assessing climate vulnerabilities and identifying adaptation options	Yes	New Zealand's Framework for Adapting to Climate Change (2014); Climate Change Impacts and Implications; MPI SLMACC projects; PCE report
c. Reviewing and appraising adaptation options	Partially	More assessment is required. Implementation of the forthcoming MfE coastal guidance for local government using adaptive pathways approaches.
d. Compiling and communicating national adaptation plans	No	--
e. Integrating climate change adaptation into national and subnational development and sectorial planning	Yes	The RMA Quality Planning Resource for Climate Change (2013); New Zealand Coastal Policy Statement (2010); 30-year New Zealand infrastructure plan (2015); National Policy Statement for Freshwater Management (2014); Civil Defence and Emergency Management Act (2002); MfE guidance (floods, rainfall/temperature, coastal).

In short, New Zealand has significant climate change information and assessment tools and guidance already (or soon to be) available, and these are constantly being improved. As such, New Zealand is well prepared for the development of a NAP, if such a plan is deemed relevant and useful.

In the next section, the structure and commonalities of existing NAPs from nine other countries are examined (although interestingly, only one is actually referred to as a NAP), and the elements that might be of greatest relevance for New Zealand are considered. Based on this assessment, the commonalities that could be considered for a NZ NAP structure are identified.

8 Structure and key elements of selected NAPs

8.1 United States of America

U.S. Environmental Protection Agency (EPA) Climate Change Adaptation Plan 2014³⁶

8.1.1 Overall Purpose

To ensure that the US EPA can continue to fulfil its mission of protecting human health and the environment even as the climate changes.

8.1.2 Approach

The Plan identifies vulnerabilities to EPA's mission and strategic goals from climate change (e.g., taking action on climate change and improving air quality, protecting America's waters, cleaning up communities and advancing sustainable development, ensuring the safety of chemicals and preventing pollution, and enforcing environmental laws).

It also defines guiding principles for adaptation (Figure 8-1), and details 10 agency-wide priorities for adaptation (this takes up the majority of the document; two key priorities are strengthening adaptive capacity of EPA staff and partners through training, and develop Program and Regional Office Implementation Plans).

Lastly, it sets near-term Key Performance Indicators (KPIs) for monitoring and evaluation purposes (e.g. the 2011-2015 Strategic Plan includes integrating considerations about climate change science and adaptation into five rule-making processes, five major grant, loan, contract or technical assistance programs, and five major scientific models or decision support tools, all by 2015).

8.1.3 Outline of responsibilities

The tenth priority for adaptation is developing Implementation Plans (IPs). These provide more detail on how each EPA National Environmental Program Office, all 10 Regional Offices, and several National Support Offices will carry out the work called for in the agency-wide plan. Each IP will be unique to the particular EPA Office, but will have a consistent framework (Figure 8-2) and integrate climate change adaptation into its planning and work in a manner consistent and compatible with the goals and objectives of EPA's overall plan.

8.1.4 Review of plans and reporting

There is a detailed section on Monitoring and Evaluation (M&E), with near-term (2011-2015) KPIs already in place in the EPA Strategic Plan. Each Program Office is also to put in place evaluation measures, with regular review periods.

8.1.5 Usefulness for the development of a New Zealand NAP

The way the EPA Adaptation Plan is combined with multiple interconnected program and regional office Implementation Plans, is a useful structure for New Zealand to consider. In the NZ case, every

³⁶ <https://www3.epa.gov/climatechange/Downloads/EPA-climate-change-adaptation-plan.pdf>

Ministry and Regional and City Council could potentially develop an IP – all following a defined structure, linked to the same overall goals and principles, but allowing for flexibility as necessary.

Guiding Principles for Adaptation

- **Adopt integrated approaches:** Adaptation should be incorporated into core policies, planning, practices and programs whenever possible.
- **Prioritize the most vulnerable:** Adaptation plans should prioritize helping people, places and infrastructure that are most vulnerable to climate impacts and be designed and implemented with meaningful involvement from all parts of society.
- **Use best-available science:** Adaptation should be grounded in the best-available scientific understanding of climate change risks, impacts and vulnerabilities.
- **Build strong partnerships:** Adaptation requires coordination across multiple sectors and scales and should build on the existing efforts and knowledge of a wide range of public and private stakeholders.
- **Apply risk-management methods and tools:** Adaptation planning should incorporate risk-management methods and tools to help identify, assess and prioritize options to reduce vulnerability to potential environmental, social and economic implications of climate change.
- **Apply ecosystem-based approaches:** Adaptation should, where relevant, take into account strategies to increase ecosystem resilience and protect critical ecosystem services on which humans depend to reduce vulnerability of human and natural systems to climate change.
- **Maximize mutual benefits:** Adaptation should, where possible, use strategies that complement or directly support other related climate or environmental initiatives, such as efforts to improve disaster preparedness, promote sustainable resource management, and reduce greenhouse gas emissions including the development of cost-effective technologies.
- **Continuously evaluate performance:** Adaptation plans should include measureable goals and performance metrics to continuously assess whether adaptive actions are achieving desired outcomes.

(Source: The White House Council on Environmental Quality, “Progress Report of the Interagency Climate Change Adaptation Task Force: Recommended Actions in Support of a National Climate Change Adaptation Strategy,” October 5, 2010, <http://www.whitehouse.gov/sites/default/files/microsites/ceq/Interagency-Climate-Change-Adaptation-Progress-Report.pdf>.)

Figure 8-1: US EPA’s Guiding Principles for Adaptation.

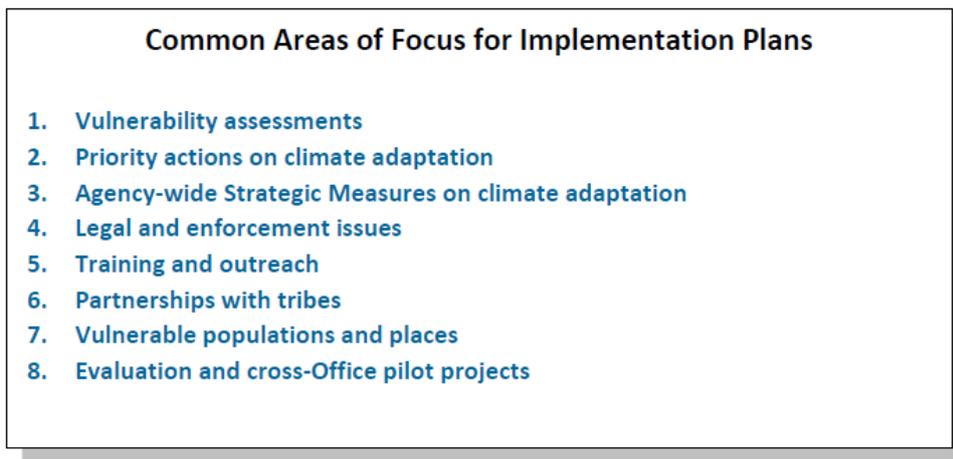


Figure 8-2: US EPA’s Common Areas of Focus for Implementation Plans.

8.2 Canada

Adapting to Climate Change: An Introduction for Canadian Municipalities

*Natural Resources Canada, 2010.*³⁷

8.2.1 Overall Purpose

National guidance to provide municipal decision-makers and staff with information to aid in understanding the need for climate change adaptation and how to put adaptation measures in place.

8.2.2 Approach

This document is an update and expansion of the 2006 version *Adapting to Climate Change*. In the first section, it describes the importance of adaptation and lists reference guides that can help municipalities identify and address risks and opportunities. It then provides 11 case studies from across Canada of how climate change considerations can be integrated into municipal decision making (see example in Figure 8-3).

8.2.3 Outline of responsibilities

The responsibility is left to individual municipalities to incorporate climate change adaptation into their own decision making processes.

8.2.4 Review of plans and reporting

There is no mention of when the document will be reviewed, however this is the second version that was updated after a 4 year period (2006-2010).

³⁷ https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/environment/pdf/mun/pdf/mun_e.pdf

8.2.5 Usefulness for the development of a New Zealand NAP

The case studies described in the Canada NAP range from urban to rural, and so provide a good range of existing examples of how adaptation can be put into practice. For example, a few relevant case studies include: 1. Provide better communication equipment to combat higher risks caused by melting ice; 2. Reduce flood risk by incorporating climate change predictions into urban storm water planning and by creating an adjacent wetland for drainage, and 3. Improve air quality and provide carbon sinks by planting urban forests.

MfE and MPI have already begun the process of compiling sets of climate change adaptation case studies for New Zealand, and the Climate Change Impacts and Implications project includes five case studies ranging from the alpine to the marine environment. The forthcoming MfE coastal guidance for NZ also contains case studies and examples (but not for managed retreat of communities). Further case studies could be performed based on the Canadian examples.



INNOVATIVE ZONING BYLAW

Rather than prohibiting all development projects in flood-prone areas of Le Goulet, the local planning commission took a more targeted approach. Using results from the discussion groups, the commission identified a zone where climate change impacts are considered a major risk that developers must consider in their plans. The zoning bylaw provides an opportunity to educate developers about the climate change related risks to people and infrastructure, and ensures that appropriate, but not prescriptive, measures are taken to accommodate those risks. The commission is working with the New Brunswick Department of Environment to develop criteria for adaptation that developers should consider when presenting a development proposal.

Figure 8-3: Excerpt from the Canadian case study on planned relocation in Le Goulet as an option to address sea-level rise.

8.3 Australia

National Climate Resilience and Adaptation Strategy 2015³⁸

8.3.1 Overall Purpose

The Strategy sets out how Australia is managing climate risks for the benefit of the community, economy and environment. It identifies a set of principles to guide effective adaptation practice and resilience building, and outlines the Government’s vision for the future.

8.3.2 Approach

The Strategy defines a set of six “Guiding principles” (shared responsibility, evidence-based risk management approach, factor climate risk into decisions, collaborative values-based choices, assist the vulnerable, and revisit decisions and outcomes over time).

It also sets four “Priorities for national engagement” (understand and communicate, plan and act, check and reassess, and collaborate and learn).

The Strategy builds on the 2007 National Climate Change Adaptation Framework, which includes an Action Plan under two Priority Areas: 1. Building understanding and adaptive capacity, and 2. Reducing vulnerability in key sectors and regions.

Lastly, it outlines potential national actions in key sectors and policy areas (coasts, cities and the built environment, agriculture fisheries and forestry, water resources, natural ecosystems, health and wellbeing, disaster risk management, and a secure and resilient region). Under each section, three questions are asked: 1. What are the risks from a changing climate? 2. What are we doing to improve resilience?, and 3. What do we need to do in the future?

8.3.3 Outline of responsibilities

The first guiding principle (shared responsibility) states “Governments at all levels, businesses, communities and individuals each have different but complementary and important roles to play in managing climate risks”.

To this end, the strategy highlights existing and potential adaptation actions by both public and private individuals and organisations, and advocates the use of evidence-based risk management (second guiding principle) to factor climate risk into the decision making process (third guiding principle).

³⁸ <https://www.environment.gov.au/system/files/resources/3b44e21e-2a78-4809-87c7-a1386e350c29/files/national-climate-resilience-and-adaptation-strategy.pdf>

8.3.4 Review of plans and reporting

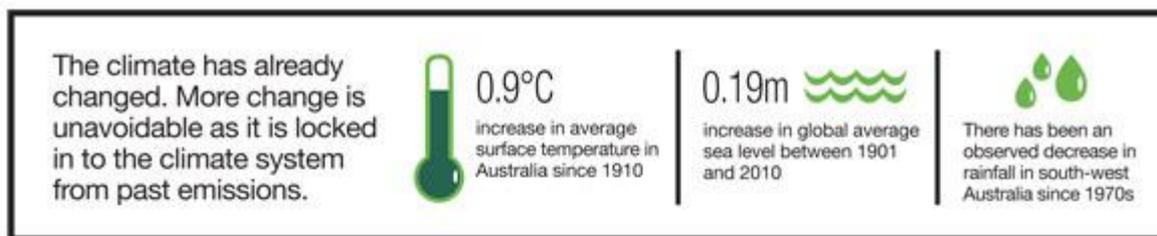
There is no specific mention of a schedule for reviewing the Strategy, however the sixth guiding principle (revisiting decisions and outcomes over time) builds on the concept of adaptive management, which does suggest that review and re-evaluation are critical.

The 2007 Framework includes a statement that “Biennial reports on implementation will be produced and the Framework reviewed in year four” (which would be 2011/12).

8.3.5 Usefulness for the development of a New Zealand NAP

The combination of a Framework for Action and a Strategy is excellent, and could form the basis for a New Zealand NAP. It is interesting that the Framework was developed eight years before the Strategy (noting that New Zealand has already developed a Framework, but it is less specific in terms of actions).

The guiding principles and priorities for national engagement are directly applicable to New Zealand, and outlining existing and potential adaptation action by key sectors and policy areas fits in with the New Zealand context as well.



MANAGING A CHANGING CLIMATE REQUIRES A DUAL APPROACH

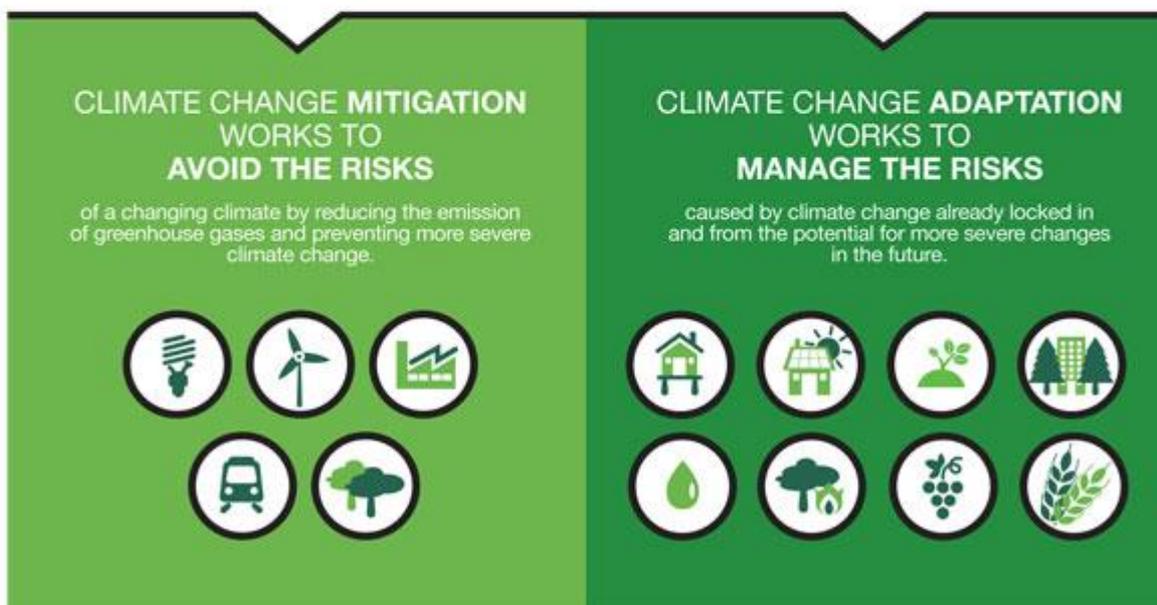


Figure 8-4: Australia National Adaptation Strategy Infographic.

8.4 United Kingdom

The National Adaptation Programme: Making the country resilient to a changing climate (July 2013).³⁹

8.4.1 Overall Purpose

The National Adaptation Programme is linked to the U.K. Climate Change Risk Assessment (CCRA 2012; recently updated in 2017) and is designed to ensure that key sectors across England (other UK countries are developing their own NAPs) are adequately prepared for the consequences of climate change.

8.4.2 Approach

The risks (defined as the potential for consequences when something of value is at stake) and opportunities of climate change to several UK sectors (built environment (see Figure 8-5), infrastructure, communities, agriculture and forestry, natural environment, business and local government) have been identified in the CCRA (with updates every five years).

The NAP (to be updated by 2018) considers these risks (for England) and identifies existing and required objectives, policies and proposals to address the risks and benefit from the opportunities. Objectives cover four main areas: increasing awareness, increasing resilience to current extremes, taking timely action for long-lead time measures, and addressing major evidence gaps.

Each chapter (one for each sector) identifies key focus areas of greatest vulnerability/risk (e.g. for the built environment these are flooding and coastal erosion, spatial planning, increasing adaptive capacity, and making homes and communities more resilient) and includes a table of actions (and actors) to address priority risks (e.g. develop local flood risk management strategies that consider the effect of future climate change and the increasing severity of weather events: Lead local flood authorities and the Environment Agency); see Figures 8-5 and 8-6.

8.4.3 Outline of responsibilities

The principal user of the Adaptation Programme is the government's Environmental Agency (EA) and the Department of Energy and Climate Change (DECC), however partnerships with industry, local government and civil society are stated as being very important. Various governmental and non-governmental actors are listed in the tables of actions (which are quite detailed in the annex) and it is implied (but not explicitly stated) that these actors will each develop specific implementation plans.

³⁹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/209866/pb13942-nap-20130701.pdf

8.4.4 Review of plans and reporting

The first CCRA was published in 2012, and this has recently been updated in 2017 according to a decree in the Climate Change Act 2008 for 5-year reviews and updates. Likewise, the NAP will be reviewed and updated in 2018. This update will have a section on progress toward the adaptation goals.

In terms of monitoring and evaluation, both the CCRA and NAP include an M&E plan. The CCRA focuses on risk magnitude and adaptive capacity, while the NAP focuses on process-based markers (e.g. whether planned policies have been implemented) and quantitative data on factors that influence risks (e.g. number of people living in flood-prone areas).

8.4.5 Usefulness for the development of a New Zealand NAP

The most useful element is that the NAP is based firmly on the UK Climate Change Risk Assessment (CCRA), and that there is a mandate to update both the NAP and CCRA every five years. In New Zealand, significant work has been done to assess climate change risks, but a comprehensive national risk assessment and prioritisation process would be extremely valuable.

The “register of actions” is particularly relevant, although this needs to be followed up with actual government departmental and other stakeholder implementation plans.

CCRA Risk	Description
FL7a/6a	Non-residential and residential properties at significant risk of flooding
FL6b/7b	Expected Annual Damage (EAD) to residential and non-residential property due to flooding
FL12a/b	Hospitals and schools at significant risk of flooding
FL13	Ability to obtain flood insurance for residential properties
BE1	Urban Heat Island
BE3	Overheating of buildings
EN2	Energy demand for cooling
WA3	Reduction in water available for public supply
WA5	Public water supply-demand deficits
FL2	Vulnerable people at risk

Figure 8-5: Risks to the Built Environment sector in the UK.

Climate Change Risk Assessment (CCRA) risks addressed by objective (highest order CCRA risks in bold)	Actions	CCRA risks tackled by action	Owner(s)	Timing
Objective 1: To work with individuals, communities and organisations to reduce the threat of flooding and coastal erosion, including that resulting from climate change, by understanding the risks of flooding and coastal erosion, working together to put in place long-term plans to manage these risks and making sure that other plans take account of them.				
FL6b Expected Annual Damage (EAD) to residential property due to flooding	Defra Flood Management to evaluate the partnership funding approach for flood management.	FL6b, FL7b, FL13, FL6a, FL2	Defra Flood Management	By April 2015
FL7b Expected Annual Damage (EAD) to non-residential property due to flooding	Defra Flood Management and the Environment Agency to fully embed property level protection within the partnership funding approach.	FL6b, FL13, FL6a	Defra Flood Management and Environment Agency	By April 2015
FL13 Ability to obtain flood insurance for residential properties	Defra Flood Management to evaluate risk management authority delivery of their roles and responsibilities established under the Flood and Water Management Act 2010.	FL6b, FL7b	Defra Flood Management	By April 2015
FL6a Residential properties at significant risk of flooding	Defra Flood Management and the Environment Agency to work towards meeting the requirements of the European Floods Directive and embed evolving understanding of surface water flooding in policy and delivery approaches.	FL6b, FL7b, FL13	Defra Flood Management and Environment Agency	From December 2013 for surface water mapping; December 2015 for local strategies and flood risk management plans
FL2 Vulnerable people at significant risk of flooding				2013/2014
	Defra Flood Management to take forward potential action on new arrangements for flood insurance, subject to the outcome of negotiations.	FL6b, FL13	Defra Flood Management	2013/2014
	Defra Water, Sustainable Drainage Systems team to take forward implementation of Flood and Water Management Act 2010 in April 2014, subject to Parliament approval, setting out national standards for sustainable drainage systems in new developments and redevelopments.	FL6b, FL7b, FL13, FL6a	Defra Water, Sustainable Drainage Systems team	By end of 2014
	Defra and the Environment Agency to implement the Flood and Coastal Erosion Risk Management Strategy for England: <ul style="list-style-type: none"> Government expects to spend £2.3bn on flooding and coastal erosion risk management over the 4 years to March 2015; Strategy will enable 165,000 households to benefit from new and improved defences, flood forecasting and early warning systems; Targeted to those most at risk and living in deprived areas; and £148M expected from private funding and local government. 	FL6b, FL7b, FL13, FL6a	Defra Flood Management and Environment Agency	Ongoing

Figure 8-6: Some of the “Register of actions” for the Built Environment sector in the UK.

8.5 Ireland

National Climate Change Adaptation Framework – Building Resilience to Climate Change

*Department of the Environment, Community and Local Government (2012).*⁴⁰

8.5.1 Overall Purpose

Provides a clear mandate for the relevant government departments, agencies and local authorities to commence the preparation of sectoral and local plans, and to publish drafts of these by mid-2014.

8.5.2 Approach

The approach taken was two phased, following an EU approach (see Figure 8-7):

Phase 1 – information gathering/research, capacity building, risk assessments, tools for mainstreaming adaptation, with the acknowledgement that much of this work is already underway or exists; and

⁴⁰ <http://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/Environment/ClimateChange/FileDownLoad%2C32076%2Cen.pdf>

Phase 2 – Drafting of sectoral and local adaptation plans, review and reporting (to begin in parallel with Phase 1).

The National Climate Change Adaptation Framework is non-statutory and thus Ireland found it necessary to draft a Bill which made mitigation and adaptation plans a legal requirement. Thus, in 2015 Ireland adopted its Climate Action and Low Carbon Development Bill, which makes it a requirement to produce both a National Mitigation Plan and a National Adaptation Framework (NAF). The NAF must be produced by December 2017 and will update the National Climate Change Adaptation Framework (2012). Following from the publication of the NAF, local and sectoral plans must be in place within 12 months.

It is likely that plans will first be developed on a regional basis and then will be used by individual local authorities to guide the development of their plans. This approach will allow for integration across local authorities facing similar impacts.

8.5.3 Overview of responsibilities

Each relevant government department is mandated to prepare adaptation plans for their sectors.

As local authorities review their city and county development plans they should integrate climate change adaptation (as well as mitigation) considerations into their statutory plans.

8.5.4 Revision schedule

- Revisions of the NAF every 5 years, with a review of the mitigation and adaptation plans in tandem
- With the review, indicator criteria will be developed upon which the plans will be evaluated

8.5.5 Usefulness for the development of a New Zealand NAP

The current focus is on developing the Climate Information Platform website⁴¹ (this is well progressed) as an information portal and then putting the onus on Government Departments and local authorities to integrate climate change adaptation into their own planning process. This seems directly applicable to New Zealand.

It is a useful lesson for NZ that any strategy or plan developed should have some form of statutory backing, to avoid delays like Ireland faced.

Also the model of first developing a National Adaptation Framework, and then having a one year period for regional and local governments to develop corresponding plans, in order to encourage alignment, may be a model that could work well in New Zealand.

⁴¹ <http://www.climateireland.ie/>

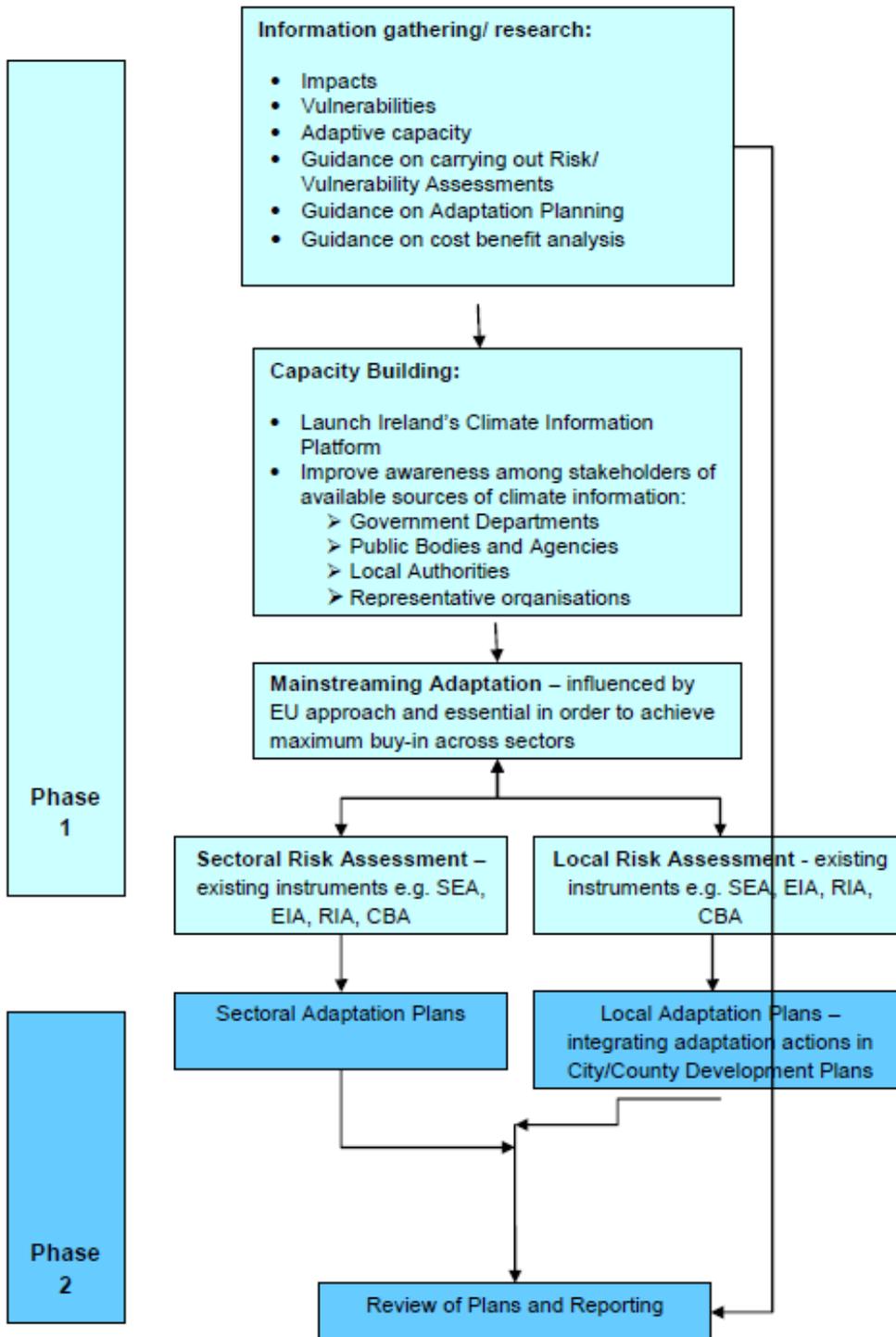


Figure 8-7: Summary of Ireland's Strategic National Adaptation Response.

8.6 Germany

*German Strategy for Adaptation to Climate Change (2008)*⁴²

8.6.1 Overall Purpose

The German Adaptation Strategy creates a framework, primarily for the federal government, for adapting to climate change in Germany, while reflecting their international responsibility. The aim is to ‘reduce the vulnerability of the natural, social and economic systems and to maintain and improve their capacity to adapt to the inevitable impacts of global climate change.’

8.6.2 Approach

The strategy takes the approach of:

- Identifying long-term impacts of climate change for Germany;
- Identifying the consequences for each sector in Germany (health, building, water, soil, biological diversity, agriculture, forestry, fisheries, energy, financial services, transport, trade, tourism, and cross-sectional topics) and possible corresponding actions for each sector; and
- Defining the German contribution to global adaptation needs.

The Strategy paved the way for a *German Adaptation Action Plan (AAP)*⁴³, which was drawn up and adopted by cabinet in August 2011. Germany also developed a Climate Action Plan 2050 in 2016, focuses on mitigation, but which links with the Adaptation Action Plan.

8.6.3 Outline of responsibilities

The federal government is leading the process through each sector of government. Each sector is responsible for implementing the relevant portion of the action plan.

8.6.4 Review of plans and reporting

The development of the indicator system and preparation for a monitoring report for the Strategy for Adaptation to Climate Change was established in 2015⁴⁴. It reviewed and updated the 102 indicators which were initially established, and set up a monitoring programme for the future.

This report on indicators was complemented by a Progress Report on the Implementation of the Strategy in 2015, which is not available online. It serves to update the Adaptation Action Plan for Phase II and to evaluate the first phase of implementation.

⁴² http://www.bmub.bund.de/fileadmin/bmu-import/files/english/pdf/application/pdf/das_gesamt_en_bf.pdf

⁴³ http://www.bmub.bund.de/fileadmin/bmu-import/files/pdfs/allgemein/application/pdf/aktionsplan_anpassung_klimawandel_en_bf.pdf

⁴⁴ http://www.umweltbundesamt.de/sites/default/files/medien/376/publikationen/climate_change_16_2015_evaluation_of_the_german_strategy_for_adaption_to_climate_change_das.pdf

8.6.5 Usefulness for the development of a New Zealand NAP

The German structure of first developing a strategy, then an action plan, and then reviewing the action plan and further developing indicators demonstrates one way which a NAP can become a living document, being updated and refined over time.

Another unique aspect of the German NAP is to define their international responsibility in terms of meeting EU and international targets and in providing assistance for developing countries to be able to meet their targets. It may be useful for New Zealand to include such a section in their NAP, particularly with respect to the Pacific island region.

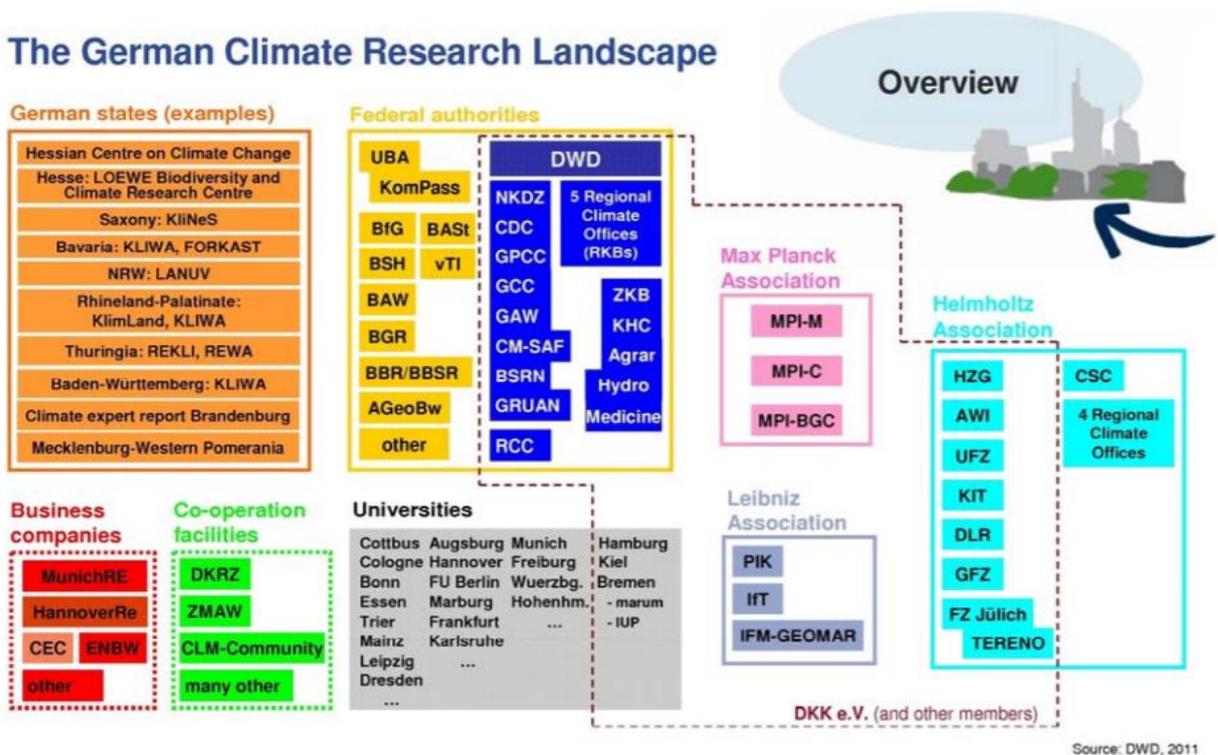


Figure 8-8: The German Climate Research Landscape.

8.7 Poland

Polish National Strategy for Adaptation to Climate Change by 2020 with the perspective by 2030 (2013)⁴⁵

8.7.1 Overall Purpose

The Polish Strategy was prepared to 'ensure the conditions of stable socio-economic development in the face of risks posed by climate change but also with a view to use the positive impact which adaptation actions may have not only on the state of the Polish environment but also on the economic growth.'

The major objective is to 'ensure sustainable development and efficient functioning of the economy and society in the conditions of climate change'.

8.7.2 Approach

The strategy identifies likely climate change trends in Poland by 2030. It then provides an analysis of the impact of climate change on vulnerable sectors by 2030, with a focus on the resulting hazards and benefits.

The second section lists 6 objectives and corresponding actions by 2020. These objectives and action lines are as follows:

Objective 1. Ensuring the energy security and good environmental status

Action line 1.1 – adaptation of the water management sector to climate change

Action line 1.2 – adaptation of the coastal zone to climate change

Action line 1.3 – adaptation of the energy sector to climate change

Action line 1.4 – protection of biodiversity and forest management in the context of climate change

Action line 1.5 – adaptation to climate changes in spatial development and construction

Action line 1.6 – ensuring the functioning of the effective health protection system in the conditions of climate change

Objective 2. Efficient adaptation to climate change in rural areas

Action line 2.1 – creation of local systems for monitoring and warning against hazards

Action line 2.2 – organizational and technical adaptation of the agricultural and fishery activity to climate change

Objective 3. Development of transport in the conditions of climate change

Action line 3.1 – developing design standards taking account of climate change

Action line 3.2 – management of transport routes in the conditions of climate change

Objective 4. Ensuring the sustainable regional and local development with consideration to climate change

Action line 4.1 – monitoring of the state of the environment and early warning and response systems in the context of climate change (cities and rural areas) Action line 4.2 – urban spatial policy taking climate change into account

Objective 5. Stimulating innovations conducive to adaptation to climate change

⁴⁵

[http://www4.unfccc.int/nap/Documents/Polish%20National%20Strategy%20for%20Adaptation%20to%20Climate%20Change%20\(NAS%202000\).pdf](http://www4.unfccc.int/nap/Documents/Polish%20National%20Strategy%20for%20Adaptation%20to%20Climate%20Change%20(NAS%202000).pdf)

Action line 5.1 – promoting innovation at the level of organizational and managerial actions conducive to adaptation to climate change

Action line 5.2 – building the system of support for Polish innovative technologies conducive to adaptation to climate change

Objective 6. Development of social behaviour conducive to adaptation to climate change

Action line 6.1 – increasing awareness of risks related to extreme phenomena and methods of limiting their impact

Action line 6.2 – protection of particularly exposed groups against the effects of adverse climate phenomena

8.7.3 Outline of responsibilities

The implementation of actions is cross-sectoral and thus it is not planned for new appointments to be made to coordinate the implementation. Key bodies to be involved in implementation include: 1. National government i.e. relevant ministries; 2. Regional governments; 3. Local governments; and 4. Business operators.

8.7.4 Review of plans and reporting

Monitoring of the implementation will be carried out by the Ministry of the Environment in 2020 based on the stated indicators developed at the level of objectives. Also, in 2015, it was planned to carry out a mid-term assessment of the implementation of the 2020 objectives, with the assessment covering actions carried out at the national and regional level. It is not clear if this review has been carried out.

8.7.5 Usefulness for the development of a New Zealand NAP

Poland's NAP is unique in that it addresses both high level concerns and also provides detailed actions with indicators over the 7 year period of this NAP. Other countries have often separated the high level strategy from the action plan.

Also, the objectives and corresponding actions integrate both sectoral and regional considerations. Thus, Poland shows that a regional and sectoral approach, with high level strategy as well as specific actions can all be incorporated together in one NAP. This may be a good approach for New Zealand.

The NAP period is relatively short (2020, with a 2030 perspective). This has the benefit that the timeframe is within most policy and planning horizons, however there is the risk that longer-term impacts requiring major adaptation strategies (e.g. relocation of infrastructure from coastal hazard zones) may not receive sufficient consideration, or worse, investment that locks in path dependency or maladaptation.

It would be useful to see if the 2015 review was carried out, and if so how the implementation of the NAP has been progressing.

Table 1. Weather phenomena causing damage to the economy.

Sector	agriculture, biodiversity, water resources	forestry	health, local communities	infrastructure
Phenomena resulting in damages	<ul style="list-style-type: none"> • flood • hurricane • lightning • drought • adverse effects of overwintering • spring frosts • rainstorm • hail 	<ul style="list-style-type: none"> • flood • strong winds • drought • flooding and landslides • cap of snow, intense snowfall • lightning • hail • heat waves 	<ul style="list-style-type: none"> • heat waves • cold waves • extreme events resulting in psychosocial damages, health damage and loss of life • landslides • drought 	<ul style="list-style-type: none"> • flood • flooding • hurricane • lightning • hailstorm • landslides • rime and snowfall • ice build-up

Source: Study by E. Siwiec (IOŚ- PIB)

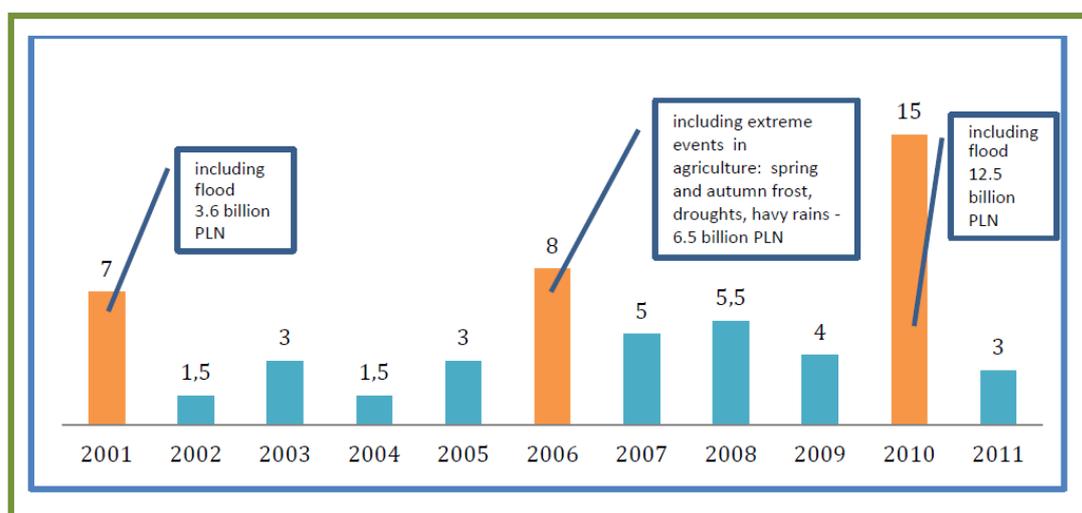


Figure 6. Estimation of losses caused by adverse weather phenomena in Poland (deflated by the investment price index 2010) in billion PLN

Source: Study by E. Siwiec (IOŚ- PIB) and J. Gąska (IBS)

Figure 8-9: Analysis of the impact of weather phenomena in Poland and of the related losses from 2001-2011.

8.8 Denmark

*Danish Strategy for Adaptation to a Changing Climate (2008)*⁴⁶

8.8.1 Overall Purpose

The Danish strategy is based on the notion that adaptation to climate change is a long-term process, and that it is still uncertain what the consequences of climate change will be and how soon they will take effect.

⁴⁶ http://en.klimatilpasning.dk/media/5322/klimatilpasningsstrategi_uk_web.pdf

8.8.2 Approach

The strategy proposes the following measures:

- identifying sectors in which climatic changes may be significant, and corresponding actions that may be attainable within 10 years (2009-2018);
- a targeted information campaign, which includes the creation of a Climate Change Adaptation web portal⁴⁷ operated by an information centre;
 - the portal contains technologies, case studies, sector information, tools, research, and publications
 - it is still active to date, with regular updates and newsletters being produced
- a research strategy, which included the establishment of a coordinating body to ensure that Danish climate research focuses on adaptation, in particular scenario modelling.

Since the strategy, an *Action Plan for a Climate-proof Denmark*⁴⁸ was drafted in 2012.

- This provided an overview of the ongoing and planned initiatives for climate change in Denmark.
- It listed specific initiatives in each sector, some with dates and targets.
- It also required municipalities to create individual action plans by the end of 2013.

A *Copenhagen Climate Action Plan: Copenhagen Climate Neutral by 2025*⁴⁹ was also developed in 2011 and paved the way for green growth and adaptation actions.

8.8.3 Outline of responsibilities

Responsibility for sector-specific adaptation to climate change is held by the sector ministries, and overseen by the *Coordination Forum* for Climate Change Adaptation, which was set up by the strategy. The Coordination Forum's purpose is to ensure a coordinated effort among public authorities.

An *Information Centre* was also set up under the Ministry of Climate and Energy in order to supply information and to create and maintain the web portal. The Information Centre serves as the Secretariat for the Coordination Forum, and ensures initiatives are implemented.

A separate *Research Unit on Adaptation* was also set up to coordinate scientific research initiatives across Denmark.

⁴⁷ <http://en.klimatilpasning.dk/>

⁴⁸ file:///C:/Users/ungarobj/Desktop/H%20drive%20backup/New%20Zealand%20NAP%20project/Output%206-NAPs/Danish_action_plan.pdf

⁴⁹ http://en.klimatilpasning.dk/media/568851/copenhagen_adaption_plan.pdf

8.8.4 Review of plans and reporting

The Coordination Forum is the main body that is responsible for monitoring the designated priorities and actions in the sectors. The Forum is expected to hold a minimum of two meetings annually.

Also, municipal action plans were to be evaluated by government by the end of 2015.

8.8.5 Usefulness for the development of a New Zealand NAP

Denmark took the approach of first focusing on short-term and pragmatic actions for each sector. Perhaps because of this, many of the actions were in the process of being implemented by 2012, when the Action Plan was developed. This lesson of ensuring actions are focused and implementable can be applied to the New Zealand context. However, some caution is required with this short-term approach to ensure the longer-term view of changing risk is properly considered – otherwise adaptation responses could lock in future unsustainable investment or create dependency on a pre-determined pathway.

After sector actions were ongoing for 5 years, the government then required municipal action plans to be developed. This approach of first focusing at the national level and then developing more regional and local plans may be appropriate for New Zealand.

The Danish approach is unique in that 3 years after their Climate Strategy was developed, they developed a separate climate action plan for their capital city of Copenhagen, which merged both climate change mitigation and adaptation actions.

It is also notable that the Danish strategy set up coordinating bodies for the main priorities outlined in the 2008 strategy. This seems to have worked well, as the web portal is still ongoing after 9 years and the sector actions are progressing. Therefore, it may be important to include the establishment of coordinating and implementing bodies in NZ’s NAP.

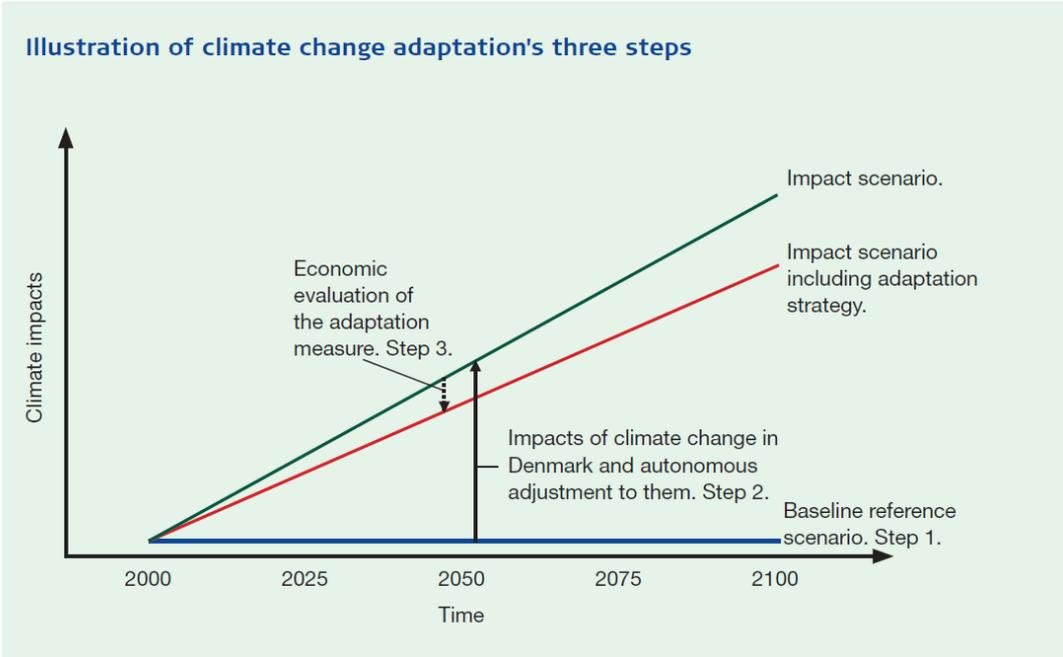


Figure 8-10: Denmark's three steps for adaptation to climate change.

8.9 Finland

Finland's National Strategy for Adaptation to Climate Change,

Ministry of Agriculture and Forestry (2005)⁵⁰

8.9.1 Overall Purpose

Finland was one of the first countries to publish a NAP in 2005. The Finnish National Strategy for Adaptation to Climate Change (2005) aims to reduce the negative consequences and take advantage of the opportunities associated with climate change. It provides an overview of the impacts of climate change in Finland, and assesses the need for adaptation measures in key sectors (see Figure 8-11).

8.9.2 Approach

The strategy provides a basis for addressing adaptation at the national ministry level. Sectors evaluated by the strategy include the following: Agriculture and food production, Forestry, Fisheries, Reindeer husbandry, Game management, Water resources, Biodiversity, Industry, Energy, Traffic, Land use and communities, Building, Health, Tourism and recreation, Insurance, and Cross-sectoral issues.

Both the likely impacts of climate change and planned sector-specific adaptation measures, with estimated timeframes, are described in detail for each sector.

To supplement the Adaptation Strategy, an Environmental Action Plan was prepared by the Ministry of the Environment in cooperation with the Ministry of Agriculture and Forestry in 2008, and was updated in 2011. The concrete measures of the Action Plan relate to biodiversity, land use and construction, environmental protection and the use and management of water resources.

A *National Climate Change Adaptation Plan 2022⁵¹* was adopted in 2014 and updated the National Adaptation Strategy 2005. The Adaptation Plan was based on lessons learned from the evaluation of the 2005 strategy and new information from adaptation research. The aim of the 2014 plan is that 'the Finnish society has the capacity to manage the risks associated with climate change and adapt to changes in the climate' (see Figure 8-12). To reach this aim, it specifies the key measures in support of adaptation to be implemented from 2014-2022 (based on long-term climate projections and likely impacts). The adaptation plan also serves to implement the *EU Strategy on Adaptation to Climate Change⁵²* within Finland.

Additionally, a *Helsinki Metropolitan Area Climate Change Adaptation Strategy⁵³* was adopted in 2012 and was jointly developed by the region's cities, municipal federations and other organisations. It focuses on the urban and built environment.

⁵⁰ http://mmm.fi/documents/1410837/1721050/MMMjulkaisu2005_1a.pdf/63f5d78d-8492-4621-b019-fe38d7aeb709

⁵¹ file:///C:/Users/ungarobj/Downloads/MMM-%23193086-v1-Finland_s_National_climate_Change_Adaptation_Plan_2022.pdf

⁵² <http://climate-adapt.eea.europa.eu/eu-adaptation-policy/strategy>

⁵³ http://ilmastotyokalut.fi/files/2014/10/11_2012_Helsinki_Metropolitan_Area_Climate_Change_Adaptation_Strategy.pdf

8.9.3 Outline of responsibilities

The National Strategy for Adaptation to Climate Change was implemented between 2005 and 2015 primarily through actions in different sectors, such as sector-specific strategies and programmes. Each sector was responsible for implementing the designated actions. The Ministry of Agriculture and Forestry developed the Strategy and was responsible for its overall implementation and evaluation, in cooperation with the Ministry of the Environment.

Finland's National Climate Change Adaptation Plan 2022 was prepared in a coordination group appointed by the Ministry of Agriculture and Forestry, with representatives from ministries, research institutes and regional actors. This coordination group is responsible for the overall implementation and evaluation of the Adaptation Plan. In addition, Annex 1 of the Plan details the actors responsible, the timeframe, and the available resources for implementing the adaptation measures listed in the plan.

8.9.4 Review of plans and reporting

A mid-term evaluation of the 2005 Strategy was carried out in 2009 and a broader assessment in 2013, with the reports only available in Finnish. Adaptation classification (adaptation levels) were used to assess the progress in adaptation of the sectors by using adaptation steps 1 to 5- Step 1: Some adaptation measures identified but not yet implemented to Step 5: Adaptation measures (e.g. strategy) implemented within the sector. Each adaptation is measured against 1) recognition of adaptation needs, 2) level of adaptation research, 3) launch of adaptation measures, and 4) co-operation with other sectors. A summary of the evaluation is described in Annex II of the National Climate Change Adaptation Plan 2022.

For the National Climate Change Adaptation Plan 2022, information is collected on the progress, impacts, costs and benefits of the adaptation measures on an annual basis. The implementation of the measures will be reviewed in 2018 and additional measures added as necessary.

A *National Climate Act* was approved in March 2015 and included a section on adaptation. According to this act, the national government must adopt a national adaptation plan at least once in every ten years and the state and local authorities must, to the extent possible, promote the implementation of the adaptation plan in their actions. Therefore it is mandated that the National Climate Change Adaptation Plan 2022 (2014) will be replaced by 2024.

8.9.5 Usefulness for the development of a New Zealand NAP

Finland has one of the most developed climate change adaptation legislation globally. They started off with a National Adaptation Strategy in 2005, which was evaluated twice, and also have developed a Climate Change Strategy for Helsinki (2012), a National Climate Change Adaptation Plan 2022 (2014), and a National Climate Act (2015), among other legislation. In the progression from 2005 to 2014, it is clear that a plan with specific short-term actions, including noting responsible parties, timeframes and available resources became a priority. Also, the need to back the action plan with a national law became evident, which also occurred in Ireland.

The 2014 adaptation plan has built on lessons from the 2005 strategy. Key messages as described in Annex II of the plan are as follows:

“The evaluation reports fully support the approach in the adaptation strategy 2005 according to which adaptation actions should be introduced through the regular planning and practical guidance of sectors. Developing adaptation actions as part of regular activities makes it possible to achieve cost-efficient solutions and reinforce the other activities of the sector or company. The most important actions to promote adaptation are to develop the key steering instruments of the sector to include the anticipation of the impacts of climate change and to review the synergies and conflicts between adaptation and other policies. For climate change adaptation support is needed from flexible steering instruments and practices that promote step-by-step progress and function in different kinds of circumstances and that can be adapted to various kinds of situations.

Many of the adaptation actions touch upon several sectors. This is why cooperation between the authorities and other actors in different sectors and administrative levels should be improved. Regional and local adaptation work needs to be further promoted. Division of labour and responsibilities between the state, municipalities and private sector should be clarified.”

In summary, the need to mainstream climate change adaptation into regular activities of government so as to increase efficiency and avoid conflicting goals is evident. Also, it is important to take a step-by-step approach with clear and practical goals, which are regularly evaluated and revised.

One item that Finland did not significantly focus on initially was the role of the local government and private sector. This has been more clearly defined in the 2014 National Adaptation Plan, and through the National Climate Act (2015). Also, until now, land uplift around the coasts of Finland has been greater than the rise in the sea level, with new land appearing, so there hasn't been the same impetus in Finland for adaptation of coastal communities.

New Zealand should consider incorporating the experiences and lessons learnt from the process Finland has undergone into the development of a NAP.

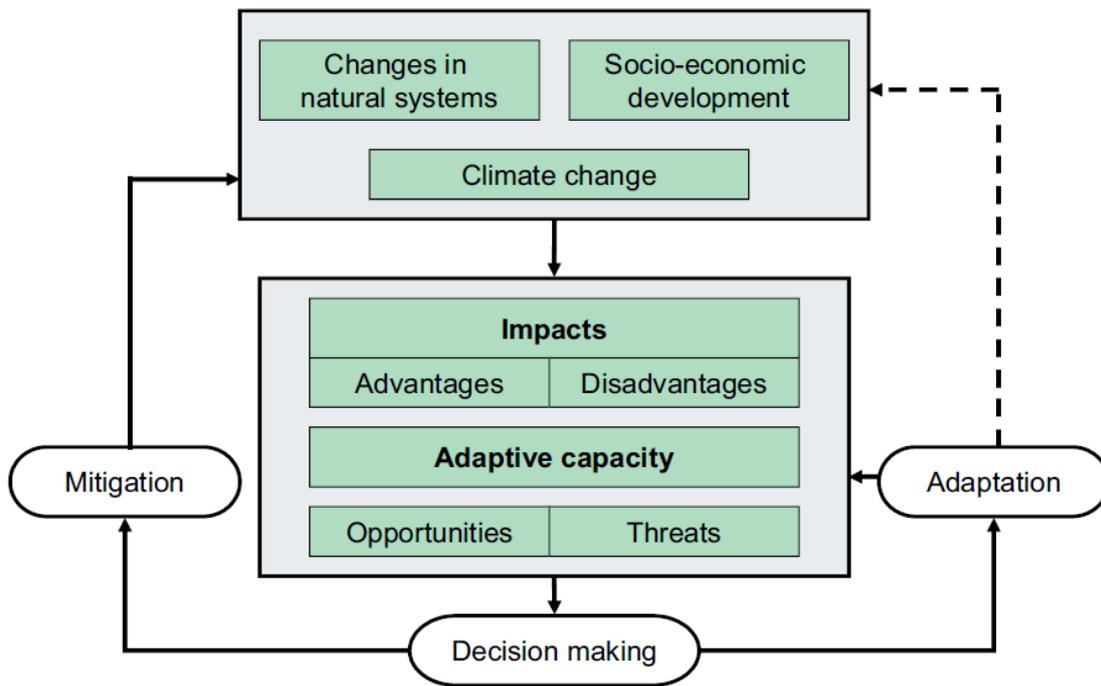


Figure 8-11: Conceptual framework of Finland's National Strategy for Adaptation to Climate Change, 2005.

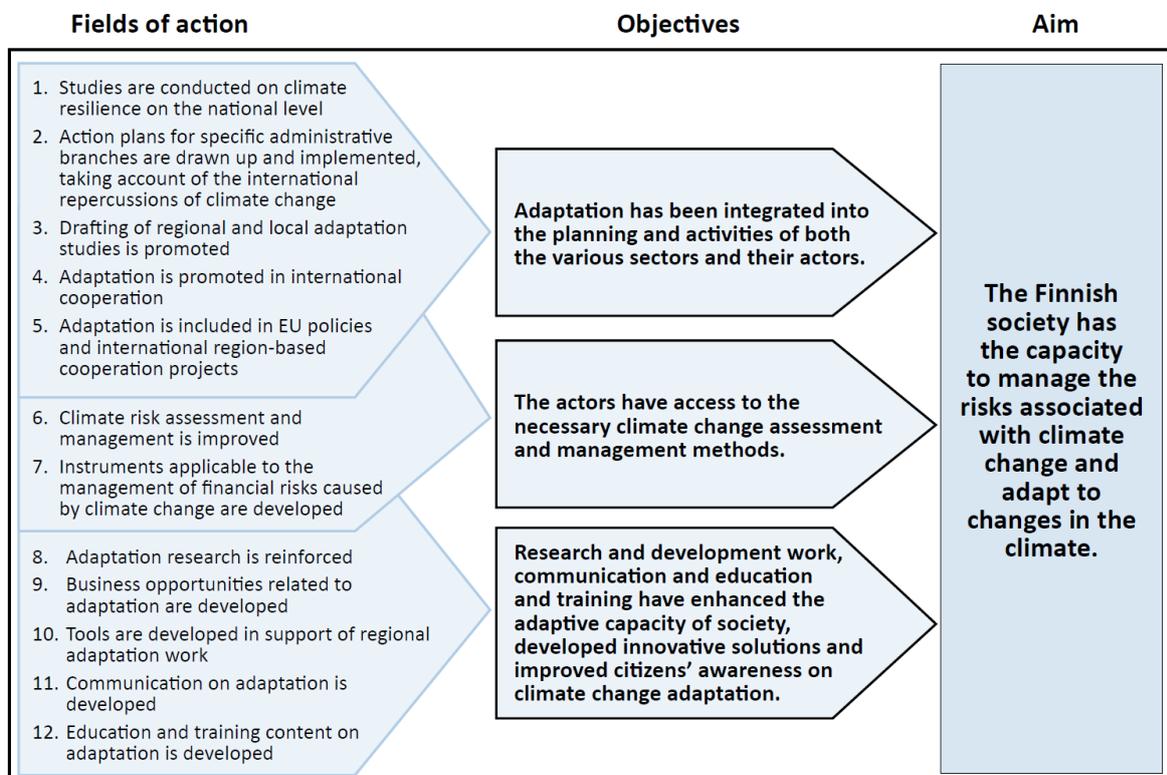


Figure 8-12: Key actions, objectives and the aim of the National Climate Change Adaptation Plan 2022 (2014).

9 Commonalities of the selected NAPs

In reviewing the selected NAPs, it became evident that there are general components of the high level strategies and of the detailed level action plans, as listed below:

9.1.1 High level (e.g. A National Adaptation *Plan (or Strategy)*, supported by a Bill), comprising:

- Adaptation goals/mission
- Guiding principles (e.g. capacity development, mainstreaming, risk management)
- Global context
- Key climate change vulnerabilities
- Priority regions/sectors/topics
- Opportunities for adaptation
- Gaps and needs
- Responsibilities for action (preferably including statutory requirements)
- Monitoring and evaluation (M&E) plan
- Funding plan

9.1.2 Detailed level (e.g. Regional/Local/Sectoral *Action (or Implementation) Plans*; to be consistent with and draw from the National Strategy), comprising:

- Specific vulnerability assessments (including cost/benefit analysis)
- Detailed priority setting
- Tool development and training (local capacity development)
- 5-year action/implementation plans for key sectors/policy areas/regions/vulnerable communities (including responsible parties, activities and timelines)
- Sources of financing for adaptation initiatives
- Integration of adaptation activities into existing plans/policies
- Sharing of good practice examples
- Detailed M&E based on success indicators
- Regular reviews (every 4-5 years) of actions/priorities

10 Summary of key recommendations for a New Zealand NAP

In summary, based on the review of the nine international NAPs in section 8, and taking into consideration the UNFCCC guidance, the key recommendations for a possible New Zealand NAP are:

- Ministries and local governments to develop their own separate implementation plans – following a defined framework or template, linked to the same overall goals and principles, but allowing for flexibility as necessary (e.g., USA, Ireland, Poland, UNFCCC).
- To develop both an Adaptation Strategy (high-level) and an Action Plan (detailed level) either as separate documents (Australia, Germany, Finland) or combined into one document (Poland).
- To include both urban and rural situations and considerations through climate change case studies and legislation (Canada).
- To list both existing and potential adaptation actions by key sectors and policy areas (Australia, UK, Germany, Denmark). Regional priorities may also be included in the same document (Poland).
- To focus on short-term implementable actions, which are based on longer term climate projections (UK, Poland, Denmark, Finland).
- To list key prioritized actions, with responsible parties, timeframes, resources available, and evaluation indicators described in detail (UK, Poland, Finland).
- To have a mandate to evaluate and update the NAP on a regular basis, thus making it into a flexible, living document (UK, Germany, Finland, UNFCCC).
- To have any adaptation strategy or plan developed be statutory (Ireland, Finland).
- To base a NAP on a comprehensive national climate change risk assessment and prioritisation process (UK, UNFCCC).
- To mainstream climate change adaptation into regular activities of government so as to increase efficiency and avoid conflicting goals (Finland).
- To develop separate municipal adaptation plans for large cities (Denmark, Finland).
- To develop a national research strategy for climate change adaptation in order to ensure climate change research fills in gaps in knowledge required for adaptation planning (Denmark).
- To establish a coordinating body to oversee implementation and evaluation of strategies and plans (Denmark, Finland).
- To develop a national web-based information portal for climate change information (Ireland, Denmark).

- To establish pathways for integrating climate change data and information from the science sector into a NAP and corresponding policies and actions (USA, Denmark).
- To consider international responsibilities when developing a NAP (Germany, Finland).

11 Questions and discussion topics for a stakeholder workshop

We suggest that the next step in determining whether a NAP will be beneficial for New Zealand is to hold a stakeholder workshop. The following topics and questions could be the basis for the workshop discussion:

- Is the current NZ statutory framework sufficient to plan for and implement climate change adaptation?
- What are the current gaps and needs in terms of adaptation planning in NZ?
- Would a NZ NAP be useful for adaptation planning? If so, how?
- What level of NAP would be most useful (high level, detailed, or both)? How detailed will the NAP be?
- Would a sector or regional focused approach be more appropriate for NZ, or some combination of them both?
- Are there certain NAPs (or sections of NAPs) that NZ could model theirs after?
- Who would be responsible for contributing to a NAP for each region/sector?
- How would district, regional and national adaptation work streams and responses be prioritised under a NAP framework?
- Who would be responsible for the overall development and implementation of the NAP?
- How would the NAP be monitored and evaluated?
- Are revised or new financing and insurance models needed to support implementation of adaptation to climate change (e.g. to deal with inequities or uneven distribution of impacts)

Appendix 1: Steps for developing National Adaptation Plans

<h2 style="text-align: center;">NATIONAL ADAPTATION PLANS</h2> <p style="text-align: center;">TABLE OF STEPS, BUILDING BLOCKS AND SAMPLE OUTPUTS UNDER EACH OF THE FOUR ELEMENTS OF THE NAP PROCESS</p>		
Steps	Checklist of building blocks	Sample NAP outputs
Element A. Lay the groundwork and address Gaps		
1. Initiating and launching of the NAP process	<ul style="list-style-type: none"> <input type="checkbox"/> Briefing on NAP process - adaptation challenges & opportunities <input type="checkbox"/> Coordinating mechanism <input type="checkbox"/> National vision and mandate for NAPs <input type="checkbox"/> Access to technical and financial support <input type="checkbox"/> NAP framework/strategy and road map 	<ul style="list-style-type: none"> ▸ Mandate for the NAP process ▸ Framework and strategy for climate change adaptation ▸ Funded project to support operations of the NAP process ▸ Road map for the NAP process
2. Stocktaking: identifying available information on climate change impacts, vulnerability and adaptation and assessing gaps and needs of the enabling environment for the NAP process	<ul style="list-style-type: none"> <input type="checkbox"/> Stocktaking of adaptation activities <input type="checkbox"/> Synthesis of available knowledge on impacts, vulnerability and adaptation <input type="checkbox"/> Capacity gap analysis <input type="checkbox"/> Barriers analysis 	<ul style="list-style-type: none"> ▸ Report on synthesis of available information ▸ Geospatial database in support of the NAP process ▸ Knowledge-base of observed climate impacts, vulnerabilities and potential interventions ▸ Gap and needs analysis report ▸ Barrier analysis report
3. Addressing capacity gaps and weaknesses in undertaking the NAP process	<ul style="list-style-type: none"> <input type="checkbox"/> Building institutional and technical capacity <input type="checkbox"/> Opportunities for integrating adaptation into development <input type="checkbox"/> Programmes on climate change communication, public awareness-raising and education 	<ul style="list-style-type: none"> ▸ Strategy document(s) for capacity-building, awareness-raising, communication and education ▸ NAP website
4. Comprehensively and iteratively assessing development needs and climate vulnerabilities	<ul style="list-style-type: none"> <input type="checkbox"/> Compile development objectives, policies, plans and programmes <input type="checkbox"/> Synergy between development and adaptation objectives, policies, plans and programmes 	<ul style="list-style-type: none"> ▸ Report on stocktaking of development/adaptation activities ▸ Report on approaches for ensuring synergy between development and adaptation
Element B. Preparatory elements		
1. Analysing current climate and future climate change scenarios	<ul style="list-style-type: none"> <input type="checkbox"/> Analysis of current climate <input type="checkbox"/> Future climate risks and uncertainty/Scenario analysis <input type="checkbox"/> Communicating projected climate change information 	<ul style="list-style-type: none"> ▸ Report on climate analysis ▸ Report on climate risks/Projected climate changes ▸ Strategy for climate information services
2. Assessing climate vulnerabilities and identifying adaptation options at sector, subnational, national and other appropriate levels	<ul style="list-style-type: none"> <input type="checkbox"/> Climate vulnerability assessment at multiple levels <input type="checkbox"/> Ranking climate change risks and vulnerabilities <input type="checkbox"/> Scoping adaptation options 	<ul style="list-style-type: none"> ▸ Vulnerability and adaptation assessment report
3. Reviewing and appraising adaptation options	<ul style="list-style-type: none"> <input type="checkbox"/> Appraisal of adaptation options 	<ul style="list-style-type: none"> ▸ Report on appraisal of adaptation options ▸ Sectoral and subnational plans or strategies
4. Compiling and communicating national adaptation plans	<ul style="list-style-type: none"> <input type="checkbox"/> Draft national adaptation plans <input type="checkbox"/> Finalize NAPs and process endorsement <input type="checkbox"/> Communicate NAPs at national level 	<ul style="list-style-type: none"> ▸ Draft NAPs for review ▸ Endorsed NAPs
5. Integrating climate change adaptation into national and subnational development and sectoral planning	<ul style="list-style-type: none"> <input type="checkbox"/> Opportunities and constraints for integrating climate change into planning <input type="checkbox"/> Building capacity for integration <input type="checkbox"/> Integration of adaptation into existing planning processes 	<ul style="list-style-type: none"> ▸ Report on integration of adaptation into development
Element C. Implementation strategies		
1. Prioritizing climate change adaptation in national planning	<ul style="list-style-type: none"> <input type="checkbox"/> National criteria for prioritizing implementation <input type="checkbox"/> Identify opportunities for building on existing adaptation activities 	<ul style="list-style-type: none"> ▸ Report on prioritization of adaptation in national development
2. Developing a (long-term) national adaptation implementation strategy	<ul style="list-style-type: none"> <input type="checkbox"/> Strategy for adaptation implementation <input type="checkbox"/> Implementation of NAPs through policies, projects and programmes 	<ul style="list-style-type: none"> ▸ Implementation strategy for the NAPs
3. Enhancing capacity for planning and implementing adaptation	<ul style="list-style-type: none"> <input type="checkbox"/> Strengthening long-term institutional and regulatory frameworks <input type="checkbox"/> Training at sectoral and subnational levels <input type="checkbox"/> Outreach on outputs nationally & promotion of international cooperation 	<ul style="list-style-type: none"> ▸ National training and outreach programme(s)
4. Promoting coordination and synergy at the regional level and with other multilateral environmental agreements	<ul style="list-style-type: none"> <input type="checkbox"/> Coordination of adaptation planning across sectors <input type="checkbox"/> Synergy at the regional level <input type="checkbox"/> Synergy with multilateral environmental agreements (MEAs) 	<ul style="list-style-type: none"> ▸ Report on regional synergy ▸ Report on synergy with MEAs
Element D. Reporting, monitoring and review		
1. Monitoring the NAP process	<ul style="list-style-type: none"> <input type="checkbox"/> Identify (few) areas of the NAP process to monitor progress, effectiveness and gaps (PEG) <input type="checkbox"/> Define metrics for documenting PEG <input type="checkbox"/> Collect information throughout the NAP process to apply the metrics developed 	<ul style="list-style-type: none"> ▸ Metrics report/Monitoring Plan ▸ Database of metrics
2. Reviewing the NAP process to assess progress, effectiveness and gaps	<ul style="list-style-type: none"> <input type="checkbox"/> Synthesis of new assessments & emerging science and the results and outcomes from implemented adaptation activities <input type="checkbox"/> Evaluate metrics collected to assess progress, effectiveness and gaps of the NAP process 	<ul style="list-style-type: none"> ▸ Evaluation report
3. Iteratively updating the national adaptation plans	<ul style="list-style-type: none"> <input type="checkbox"/> Repeat some steps and update NAPs and related documentation <input type="checkbox"/> Production of updates to the NAP outputs aligned with relevant national development plans 	<ul style="list-style-type: none"> ▸ Updated NAPs
4. Outreach on the NAP process and reporting on progress and effectiveness	<ul style="list-style-type: none"> <input type="checkbox"/> Disseminate the NAPs and related outputs to the UNFCCC secretariat and others <input type="checkbox"/> Provide information in national communications on progress in and effectiveness of the NAP process 	<ul style="list-style-type: none"> ▸ Progress report and information in national communications
<small>Source: Least Developed Countries Expert Group (2012). National Adaptation Plans. Technical guidelines for the national adaptation plan process. Bonn, Germany December 2012. Available at unfccc.int/NAP.</small>		
		 United Nations Framework Convention on Climate Change