



# A WHOLE-OF-GOVERNMENT APPROACH TO CLIMATE ADAPTATION

## Mainstreaming adaptation and improving coordination in government decision making

National governments, armed with broad legal authority, robust administrative capacity, and superior economic resources, have an important role to play in leading and facilitating climate adaptation. In federations such as Canada, this leadership requires effective coordination with the regional governments—provinces, states, or territories—that exercise authority within their boundaries and jurisdiction. Many countries, including other federations such as Austria, Belgium, and Germany, have adopted national adaptation strategies and plans that set out priorities and coordinate efforts in this field, so Canada has examples to look to in ensuring effective inter- and intra-governmental coordination and mainstreaming of adaptation.

Despite global progress on the adoption of national adaptation policies over the past decade, there has been a widespread implementation deficit, whereby most countries have had difficulty in translating aspirations into concrete adaptation initiatives (Dupuis and Knoepfel 2013; Mimura et al. 2014). Two common challenges governments have faced at the implementation stage are (1) coordinating adaptation policies horizontally across departments and agencies and (2) integrating adaptation objectives into government functions, which is typically referred to as “mainstreaming” (Bednar et al. 2019; Lee et al. 2022).

This paper identifies promising mechanisms to coordinate adaptation within governments and to embed adaptation objectives into public decisions and policies. The Government of Canada is leading the development of Canada’s first National Adaptation Strategy, which will outline a shared vision for climate resilience, identify priorities for collaboration, and establish a framework for cohesive action to reduce climate change risks (Canada 2021a). The National Adaptation Strategy provides an excellent opportunity to improve horizontal policy coordination and mainstreaming in order to bring a whole-of-government approach to climate adaptation.<sup>1</sup>

<sup>1</sup>Strong coordination among all orders of government will also be crucial for the effective implementation of Canada’s National Adaptation Strategy. This scoping paper, however, addresses strategies for coordinating and mainstreaming adaptation within the federal and provincial governments.

**Dr. Daniel Henstra**

is a professor of political science and co-lead of the Climate Risk Research Group at the University of Waterloo.

This scoping paper is part of a series that explores specific challenges and opportunities in the development and implementation of adaptation policy in Canada.

# ADAPTATION POLICY COORDINATION AND MAINSTREAMING

Climate adaptation is a complex field of activity that cuts across many public policy domains. Horizontal policy coordination is important to ensure that the actions of individual departments and agencies are directed effectively and efficiently towards the goal of climate resilience. Mainstreaming climate adaptation objectives into departmental policies, programs, and operations is important to ensure adaptation is considered systematically in all government planning and decision making.

## Policy coordination puts the big picture in focus

The basic objective of policy coordination is to avoid conflict by ensuring decisions made in one department or agency consider decisions in other units. More broadly, however, it aims to motivate public sector organizations to seek cooperative solutions to complex problems and to provide better services by reducing gaps in coverage and redundancy between programs (Peters 2018).

There are four reasons why policy coordination is critical to the effectiveness of government adaptation efforts:

1. Adaptation requires working horizontally because climate change is a problem that transcends departmental divides. The pursuit of climate resilience is a whole-of-government enterprise, which cannot be achieved without interdepartmental coordination (McKenzie and Kuehl 2021).
2. Horizontal coordination can avoid overlapping or duplicative programs, which are inefficient and cumbersome for stakeholders and the public to navigate. For instance, a recent report asserted that a lack of coordination between federal departments responsible for disaster risk reduction and climate change adaptation had contributed to disjointed policies and inefficient resource allocation, asserting that “integrated approaches to program delivery offer efficiencies while enhancing effectiveness” (Council of Canadian Academies 2022, 15).



Policy coordination aims to motivate public sector organizations to seek cooperative solutions to complex problems.

3. Horizontal coordination can identify contradictory programs and practices. Although they may be adopted by individual departments to achieve legitimate ends, some actions can effectively work at cross-purposes with respect to adaptation. For example, insuring residential mortgages in areas at high risk of flooding could undermine efforts to deter development or relocate people out of hazard zones (Horne 2013).
4. A well-coordinated adaptation effort within governments demonstrates capable and decisive public leadership, which gives non-governmental actors greater confidence to adapt their own assets and operations.

In spite of its importance, horizontal policy coordination to address cross-cutting issues such as climate change has been an eternal challenge for public sector organizations (Peters 2018). Effective policy coordination is stymied by differences in professional understandings of policy issues, information asymmetries between departments, competition for scarce resources, and policy turf battles. Moreover, working horizontally has significant costs, such as the need for compromise, more time spent in meetings, increased paperwork, blurred accountability, and more complex reporting (Bakvis and Juillet 2004). Finding ways to surmount these obstacles will be crucial for the effective implementation of Canada's forthcoming National Adaptation Strategy and the policies and actions that stem from it.

## Mainstreaming confers multiple benefits

Mainstreaming refers broadly to a process through which specific ideas or objectives, such as environmental protection or gender equality, are incorporated systematically into all stages of policy and decision making (Halpern et al. 2008). In the context of climate adaptation, mainstreaming means the integration of adaptation objectives into an organization's ongoing planning and decision making, in order to "climate-proof" its own activities and strengthen its contribution to societal climate resilience (Bouwer and Aerts 2006). Adaptation mainstreaming can be broad in scope, targeting governance instruments such as legislation and sectoral strategies, but can also focus more precisely on embedding adaptation objectives into new and existing policies, programs, and operations.

Adaptation mainstreaming offers several potential benefits (Runhaar et al. 2018; Rauken et al. 2014). First, it promotes *policy coherence*—synergistic alignment of policies towards the achievement of common objectives—because it enables officials to better recognize co-benefits between adaptation actions and other public priorities. For instance, policies to preserve wetlands strengthen natural flood and storm protection, but also support biodiversity, improved water quality, and climate change mitigation (because wetlands are an effective carbon sink).

Second, mainstreaming is efficient because it positions government departments to implement adaptation objectives when windows of opportunity arise in their daily work. Replacing a major infrastructure asset, for example, offers a chance to build in climate resilience, but only if adaptation objectives are already embedded in the department's design guidelines.

Finally, mainstreaming can reduce the risk of *maladaptation*, meaning actions taken to reduce vulnerability in one system, sector, or group that inadvertently increase the vulnerability of others (Barnett and O'Neill 2010). By mainstreaming adaptation objectives, departments and agencies are

better positioned to consider how actions within their own portfolio might affect climate resilience in other policy domains and segments of society.

There are many organizational barriers to effective adaptation mainstreaming, including the absence of a clear, central mandate, conflicting departmental interests, and entrenched structures, routines, and practices that are difficult to adjust to integrate climate resilience (Cuevas et al. 2016). Overcoming these barriers requires strong executive leadership, adjustments to organizational structures and practices that promote mainstreaming as a priority, and clear accountability for results (Runhaar et al. 2018).

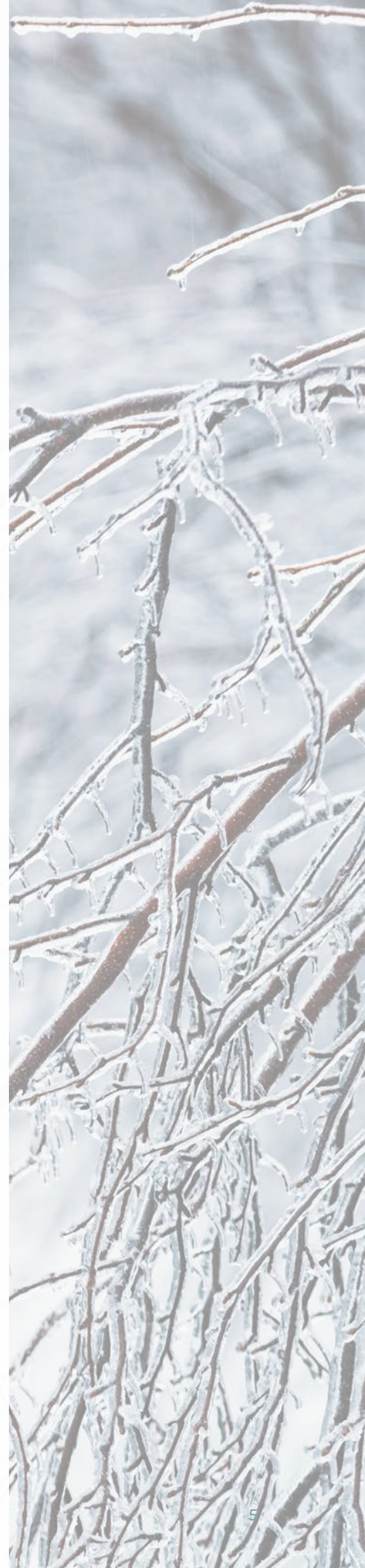


# STATE OF PRACTICE IN CANADA

Canadian researchers and governments have long recognized the importance of coordinating adaptation efforts and mainstreaming adaptation objectives into policies and plans. As early as the late 1990s, it was argued that adaptation must be “pervasive”—it must be guided by a strategy and diffused widely across regions, sectors, and scales (Burton 1998). A 2004 report on climate change impacts and adaptation identified several knowledge gaps, including how to incorporate climate adaptation into public sector risk management and planning frameworks and how to allocate responsibility for adaptation actions among departments (Lemmen and Warren 2004, xxiv). Mainstreaming was one of three central priorities outlined in the 2011 Federal Adaptation Policy Framework, which committed the Government of Canada to “ensuring that climate change considerations are integrated into federal activities, such as policy and planning processes” (Canada 2011, 3).

Implementation of these objectives over the past decade has been a challenge, however. A 2013 academic paper observed that “the integration of climate change into long-term planning has been haphazard, as various federal, provincial, and municipal civil services try to muddle through on their own in an uncoordinated way” (Williams and McNutt 2013, 92). In a 2014 survey of federal and provincial public servants, less than 12 per cent of respondents reported that climate change was affecting policy decisions in their organization (Wellstead and Stedman 2014). In 2017, the Commissioner of the Environment and Sustainable Development noted that the 19 federal departments and agencies with programs relevant to adaptation lacked direction on how to coordinate their efforts (Auditor General of Canada 2017). Furthermore, it found only weak evidence that these departments and agencies had integrated adaptation considerations into their activities and corporate risk management processes.

Similarly, a 2018 joint investigation of the federal and provincial auditors general found limited evidence that adaptation efforts were coordinated within governments (Auditor General of Canada 2018). It pointed out that lead departments had generally not provided adequate leadership, information, guidance, or training to support other departments and agencies in achieving adaptation objectives. A 2021 audit again



highlighted cross-departmental coordination as a weakness, noting the risk of “an uncoordinated policy approach among government entities, which can hamper progress on climate action” (Auditor General of Canada 2021, 11).

Provincial governments have also struggled to coordinate adaptation efforts and mainstream adaptation into their policies, programs, and operations. For instance, a 2016 audit of Ontario’s response to climate change found that the Ministry of the Environment and Climate Change, which leads provincial adaptation activities, lacked the authority to coordinate ministries and agencies and did not track their activities. It also found that the government’s commitment to “require consideration of climate change in existing and new policies and programs” had not been fully implemented (Auditor General of Ontario 2016, 161).

Similarly, in 2018 the Auditor General of British Columbia identified six ministries with roles and responsibilities related to adaptation but concluded “clearer oversight and sustained leadership” were required to coordinate departmental efforts (Auditor General of British Columbia 2018, 43). It also found that mainstreaming in most ministries was in its infancy, asserting that “more [work] is needed to integrate climate change impacts into policies, legislation, regulation and approvals” (Auditor General of British Columbia 2018, 48).

In summary, the story of adaptation in Canada over the past decade is consistent with observations in other countries: high-level commitments have been made to achieve climate resilience, but implementation lags behind. Whereas some departments and agencies have actively pursued adaptation initiatives, others have scarcely considered what climate change means for their policies, programs, and operations. Although progress has been made in coordinating and mainstreaming adaptation over time, more work is clearly needed to embed adaptation in government decision making across Canada.



# TOWARDS BETTER POLICY COORDINATION AND MAINSTREAMING

There is widespread acknowledgment that effective implementation of adaptation requires strong horizontal policy coordination and mainstreaming by governments. However, these goals have been difficult to achieve in practice, both in Canada and other countries. Many academic researchers have documented the limitations of informal, voluntary approaches to coordination and mainstreaming that exhort departments to work together but impose minimal oversight and offer no resources (e.g., Braunschweiger and Pütz 2021; Rauken et al. 2014; Widmer 2018). A frequent conclusion in these studies is that a strong, overarching governance structure, as well as robust monitoring and reporting, are required to impel departments to coordinate their activities and integrate climate change adaptation considerations into their work.

## Strategies to improve policy coordination through the National Adaptation Strategy

Although horizontal policy coordination can be achieved through informal networks of public servants, it typically requires hierarchical steering by the centre of government (Peters 2013). Research on past horizontal management initiatives within the Government of Canada offers several lessons that are instructive for the effective implementation of Canada's forthcoming National Adaptation Strategy (Bakvis and Juillet 2004):

1. To overcome interdepartmental differences, central agencies such as the federal Privy Council Office and Treasury Board Secretariat (and their provincial counterparts) must play a leadership role in directing horizontal coordination. Specifically, these central agencies should support ministers and cabinet committees in aligning departmental adaptation objectives, issue a clear mandate that specifies both the procedures and outcomes expected of public sector organizations, and clarify any new authority that these units will be empowered to exercise.



A strong, overarching governance structure is required to impel departments to coordinate their activities and integrate climate change adaptation considerations.

2. Horizontal coordination could be strengthened by embedding adaptation policy expertise in central agencies and using targeted funding to support departments in fulfilling horizontal objectives (e.g., hiring adaptation specialists).
3. Horizontal policy coordination on adaptation could be reflected in performance reviews and agreements, so public servants understand that they are accountable not only for their own department's actions, but also for contributions to the government-wide adaptation effort.
4. Horizontal coordination could be strengthened at the departmental level by creating an internal unit tasked with providing training and advice about adaptation to internal staff, and by recruiting staff who have negotiation, communication, and mediation skills to navigate horizontal coordination.

## Strategies for mainstreaming climate adaptation

There is no single, best way to approach mainstreaming, and there are at least five different strategies for integrating climate considerations into departmental planning and practice (Table 1). A comprehensive review of published literature about adaptation mainstreaming in different countries concluded that these efforts were most effective when multiple strategies were employed simultaneously (Runhaar et al. 2018).

Table 1

### Mainstreaming strategies

Strategy	Description
<b>Programmatic mainstreaming</b>	Changes to an agency's sector-based work to integrate aspects of adaptation into its policies, programs, and operations
<b>Intra- and inter-organizational mainstreaming</b>	Efforts to promote collaboration between departments and other governmental and non-governmental stakeholders to develop shared knowledge and a collective approach to adaptation
<b>Managerial mainstreaming</b>	Reconfiguration of departments, creation of new management structures, reallocation of human and financial resources, and other structural and operational alterations to institutionalize aspects of adaptation
<b>Regulatory mainstreaming</b>	Adoption of planning frameworks, regulations, legislation, and other instruments to mandate the integration of adaptation priorities into sectoral practices
<b>Directed mainstreaming</b>	Creation of centralized supports, such as specific funding, staff education, and formal directives to encourage or command the integration of adaptation priorities

Source: Wamsler and Pauleit 2016.

Canadian governments appear to have relied most heavily on the programmatic approach, which exhorts departments and agencies to review their policy portfolios to assess potential climate change impacts. An example is the statement in the Federal Adaptation Policy Framework that asserts "it is the responsibility of each federal organization to apply its experience in risk management to the climate change issues that could affect its continued ability to deliver on its mandate" (Canada 2011, 3).

Mainstreaming in Canada has also reflected the inter-organizational strategy, which promotes collaboration between departments and stakeholders to support adaptation. An example is Canada's



Climate Change Adaptation Platform, a network launched by Natural Resources Canada in 2012 to promote collaboration among governments, industry organizations, and professionals (Natural Resources Canada 2013). The network is used to determine shared priorities, address issues that cross jurisdictions and sectors, and share data, expertise, and experience.

Based on their international study, Runhaar et al. (2018, 1209) concluded that “more strict requirements for mainstreaming” must be set by governments to ensure adaptation objectives are implemented effectively. Indeed, given the limited success of programmatic and inter-organizational strategies to date, there is room in Canada for enhanced efforts that employ the managerial, regulatory, and directed approaches to mainstreaming. The following section offers some ideas about how governments can harness these strategies to coordinate adaptation efforts across government departments and to integrate climate adaptation objectives into policies, programs, and operations.



# POLICY OPTIONS FOR EMBEDDING ADAPTATION IN GOVERNMENT DECISION MAKING

Governments have access to many internal tools to shape the work of public servants to achieve government-wide objectives, and these tools could be used in different ways to achieve both horizontal coordination and mainstreaming.

## Enshrine adaptation in law

Statute law is a potentially powerful tool to coordinate and mainstream adaptation, because it clarifies powers, imposes obligations, and “provides the architecture for regulating behaviour and activities, including the performance of government functions” (McDonald 2011, 284). Moreover, enshrining adaptation objectives in law contributes to accountability by “limit[ing] actors’ discretion to do nothing or to deviate materially from general regulatory and management precepts and goals,” like those outlined in national adaptation strategies (Craig 2010, 17). Beyond regulation of standards and practices, statute law can be used to allocate policy responsibilities, redefine agency mandates, clarify legal liabilities, and create new mechanisms for review and challenge (Dovers and Hezri 2010).

Some jurisdictions have adopted laws that assign legal responsibilities for adaptation. The United Kingdom’s *Climate Change Act of 2008*, for instance, is regarded as an ambitious and robust legal framework for climate policy (OECD 2022; United Kingdom 2020c). In addition to setting legally binding emissions reduction targets, the Act required the U.K. Government to adopt clear objectives for adaptation and develop programs to address climate change risks. Furthermore, the Act established an independent Climate Change Committee, which monitors progress on reducing greenhouse gas emissions, and an Adaptation Committee, which advises the government on periodic climate change risk assessments, monitors progress on adaptation, and reports publicly every two years. The first U.K. Climate Change Risk Assessment was

“There is some evidence that Canadian governments are embracing statute law to entrench adaptation objectives.”

published in 2012 (United Kingdom 2012), followed by a second in 2017 (United Kingdom 2016), and the third is expected in 2022. The U.K. Government published a National Adaptation Programme in 2013 (United Kingdom 2013) and adopted a second National Adaptation Programme in 2018 (United Kingdom 2018).

The 2008 *Climate Change Act* empowered the Secretary of State to compel public organizations and private critical infrastructure operators to report on current and anticipated climate change impacts on their organization as well as proposed adaptation actions to address these impacts. In the first round of reporting (2010-2011), nearly 100 organizations across nine sectors submitted reports about their climate change risks and adaptation plans. An independent analysis identified several benefits of this “Adaptation Reporting Power,” asserting that the mandatory reporting had:

- ▶ served as a catalyst for many organizations to formally consider adaptation for the first time;
- ▶ raised the visibility of adaptation at executive levels;
- ▶ embedded climate change risks in corporate risk management practices;
- ▶ raised awareness of cross-sectoral interdependencies;
- ▶ generated extensive evidence to gauge progress on adaptation in vulnerable sectors; and,
- ▶ promoted actions to climate-proof assets and operations, such as new approaches and design standards (Centre for Environmental Risks and Futures 2012).

The U.K. Government has since expanded on the 2008 *Climate Change Act* by attaching adaptation objectives to the Green Book, a central framework issued by HM Treasury<sup>2</sup> to guide policy and program appraisal, which aims to optimize public value by considering costs, benefits, and trade-offs associated with alternative implementation options (United Kingdom 2020b). The change obligates policymakers to identify climate change risks to proposed policies, programs, and projects and to build in adaptation measures where cost-effective (United Kingdom 2020a).

A recent evaluation of the U.K. *Climate Change Act* and its subsequent implementation tools concluded that the law has enhanced the long-term certainty and predictability of climate policy, because it has entrenched new institutions and routines and has engendered a broad-based political commitment to climate action (Averchenkova et al. 2021). However, it also noted that the Act itself has spurred little concrete adaptation action because it is heavily focused on procedures and reporting and contains no legal requirement for organizations to materially reduce climate risks.

There is some evidence that Canadian governments are embracing statute law to entrench adaptation objectives in their planning and decision making. For instance, British Columbia’s *Climate Accountability Act* mandates the Minister of Environment and Climate Change Strategy to report annually on plans to manage climate change risks (British Columbia 2019). Similarly, one of the explicit purposes of Nova Scotia’s *Environmental Goals and Climate Change Reduction Act*, passed in November 2021, is “to build climate

---

<sup>2</sup> HM Treasury is the UK Government’s ministry of economics and finance, which controls public spending and sets the direction of economic policy.

change adaptive capacity and resilience by requiring climate adaptation planning across every Government department” (Nova Scotia 2021). The legislation commits the provincial government to formulating a strategic plan to address climate change objectives, which include “adapting to the impacts of climate change and building a climate resilient Province.” In support of these objectives, the province has created a Climate Adaptation Leadership Program that provides hands-on learning for departmental staff to assess climate change impacts and design adaptation actions to address them.

In 2021, the Government of Canada passed the *Canadian Net-Zero Emissions Accountability Act*, which mandates greenhouse gas emissions reductions. Similar laws specifying accountability for climate change mitigation have been passed in several provinces, including British Columbia and Manitoba. As governments and stakeholders formulate Canada’s forthcoming National Adaptation Strategy, they should consider a national climate change adaptation law as a chief instrument to facilitate its implementation. The adaptation elements of such a climate accountability act have been examined in detail (Beugin et al. 2020; Croome et al. 2020) and much of the institutional infrastructure required to administer the law is already in place.

Statute law has strengths as a potential tool to coordinate adaptation policies and embed adaptation into decision making. Legislation is a comprehensive instrument that can be used to codify the actions and behaviours expected of all relevant departments and agencies, simultaneously conferring new authorities and imposing new obligations (Page 1985). It also offers a legal foundation to adopt subsequent instruments, such as standards or regulations that specify in detail what is expected of government units, ways in which compliance will be monitored, and how results will be evaluated.

However, whereas the ultimate goal is to influence the norms and values of public officials so that they think reflexively about climate resilience when designing policies and programs, legal tools are typically better suited for prohibiting behaviours rather than encouraging them (Pal 2000). At a minimum, an adaptation law must be complemented by support resources such as information and training.

### Issue an adaptation policy directive

A clear, consistent political commitment is required to effectively embed climate adaptation objectives into all relevant government activities. One mechanism to entrench this political commitment is a central policy directive that mandates departments and agencies to coordinate adaptation efforts and to undertake mainstreaming as a specific activity.

ff  
As governments and stakeholders formulate Canada’s forthcoming National Adaptation Strategy, they should consider a national climate change adaptation law as a chief instrument to facilitate its implementation.

Such a government-wide policy would instruct responsible public service officials to engage in “portfolio screening” to (1) assess the climate resilience of their strategies, policies, programs, projects, and budget allocations, (2) investigate whether these instruments exacerbate climate change risks, and (3) consider how these tools could be harnessed to further adaptation objectives (Klein et al. 2007; Schaar 2008).

Governments already have the administrative apparatus to implement this approach. At the federal level, for instance, the Treasury Board has the authority to adopt government-wide policies “to ensure that government resources are effectively managed ... and to manage significant risks to the operations of government” (Canada 2022). Departmental compliance with Treasury Board policies is monitored and enforced through the Management Accountability Framework, which is used to assess the practices and performance of federal departments and agencies on an annual basis, highlighting strengths and opportunities for improvement.

The Government of Canada has taken some initial steps in this direction. First, the *Greening Government Strategy*, a plan developed to support the implementation of Canada’s sustainability goals, includes a section on “climate-resilient services and operations” (Canada 2020b). Overseen by the Treasury Board Secretariat, the Strategy requires departments to “take action to reduce climate change risks to assets, services and operations” by incorporating climate change into business continuity planning, risk management processes, and program design and delivery. Second, the Prime Minister has instructed the Minister of Environment and Climate Change to “work with the President of the Treasury Board on the application of a climate lens to ensure climate adaptation and mitigation considerations are integrated throughout federal government decision making” (Canada 2021b).

Centralized policy directives at the provincial level offer similar entry points for coordinating and mainstreaming adaptation objectives. British Columbia’s Core Policy and Procedures Manual, for example, outlines government-wide objectives and standards for sound management (British Columbia 2021). Its sections on risk management and business continuity management could fairly readily incorporate climate change risks and a requirement to adopt adaptation responses. Similarly, the Government of Ontario’s Enterprise Risk Management Directive mandates all ministries and agencies to identify, assess, and mitigate risks to their programs and activities (Ontario 2020). This instrument could be adjusted to set out principles and objectives for incorporating adaptation into risk management and to provide detailed guidance to support ministry compliance with the directive’s requirements.

Adopting an adaptation policy directive would send a clear signal to departments and agencies that embedding adaptation in decision making is a political priority that deserves attention from the centre of government. Entrenching adaptation through a government-wide policy directive would reinforce its significance as a whole-of-government effort and would strengthen accountability for results. Finally, an adaptation directive could spur the development of adaptation policy expertise within central agencies, which would further embed climate resilience as a screening lens for new policies, programs, and budget allocations.

One challenge with designing a central adaptation policy directive is to determine the scope and substance of the policy. A persistent barrier to coordinating and mainstreaming adaptation is the emphasis on process over outcomes (Russel et al. 2020). To be effective, a central adaptation policy

directive would need to go beyond imposing obligatory processes, targeting instead the implementation of concrete adaptation actions. A second challenge is that policy coordination and integration are difficult to sustain over time. Although an adaptation policy directive would raise the importance of these priorities, active leadership by central agencies would likely be essential to impel interdepartmental coordination and motivate units to mainstream adaptation objectives into their work (Bakvis and Juillet 2004).

### Establish a central adaptation policy unit

Embedding adaptation in departmental portfolios might require a new institutional structure that fosters coordination, champions the integration of adaptation objectives, and holds departments and agencies accountable for their progress. There are various traditional means to achieve these ends, such as ministerial councils and cross-departmental task forces, but one promising approach is to establish a new adaptation policy unit attached to a central agency such as the Privy Council Office or Treasury Board Secretariat. This unit would be tasked with horizontal coordination and overseeing the implementation of adaptation objectives.

In this respect, Canada is an outlier among OECD countries, many of which have long ago created an entity whose exclusive or primary purpose is to coordinate adaptation (Bauer et al. 2012). For instance, Australia, Austria, Denmark, Finland, Germany, Norway, Spain, the Netherlands, and the United Kingdom all have a dedicated unit that facilitates horizontal coordination either at the policy level (i.e., setting overall goals) or at the administrative level (i.e., harmonizing adaptation objectives across sectoral policies, programs, and operations). For instance, Finland's 2005 National Adaptation Strategy outlined adaptation measures across 15 sectors, the implementation of which was coordinated by a Monitoring Group on Climate Change Adaptation chaired by the Minister of Agriculture and Forestry and comprising representatives from the relevant ministries and other authorities (Finland 2017).

It is generally accepted that ad hoc, voluntary, and uncoordinated adaptation efforts are insufficient to achieve Canada's national objectives regarding climate resilience (Feenan and Mohammad 2021; Hammill et al. 2021). The creation of a central adaptation policy unit would provide much-needed coordination to adaptation efforts, better institutionalizing cross-departmental coordination and more effectively monitoring mainstreaming. Locating the unit within a central agency, furthermore,

“Entrenching adaptation through a government-wide policy directive would reinforce its significance as a whole-of-government effort and would strengthen accountability for results.”

would give it influence to resolve some of the key barriers to horizontal coordination, such as inter-departmental competition, ambiguous accountability, and poor monitoring and evaluation.

Establishing a central adaptation policy unit could also face some challenges, however. Lessons might be drawn here from the Climate Change Secretariat, an institutional structure created in 1998 to provide horizontal coordination of the Government of Canada's national strategy to reduce greenhouse gas emissions (Bakvis and Juillet 2004). Because the Secretariat had no independent statutory authority, it had to rely on exhortation and persuasion to convince departments to act on climate change, often with little success. By contrast, the central adaptation policy unit discussed here might be endowed with the legal authority to compel departments to act and to hold departments accountable for their performance on climate change adaptation. Furthermore, whereas the Climate Change Secretariat depended on annual renewal of its budget for its survival, the central adaptation unit would be best able to fulfil its functions if endowed with a stable budget so that it could make multi-year strategic plans and use funds in creative ways to incentivize coordination and mainstreaming.

## Leverage appraisal tools

*Ex ante* appraisal of policies and projects (appraisal based on forecasts rather than actual results) offers an opportunity to proactively integrate climate adaptation before a decision is taken and a course of action is implemented. Policy and project appraisal can contribute to horizontal coordination by identifying potential spillover effects, in which a decision in one policy area has impacts on another (Russel and Jordan 2009). It can contribute to mainstreaming by ensuring adaptation and climate resilience are part of the screening lens as policies are formulated and projects are considered for approval.

Environmental impact assessment is one widely used tool to evaluate the potential effects of a proposed project on the environment. Environmental impact assessment could integrate climate adaptation by requiring proponents to assess both direct climate change impacts on projects, such as more extreme temperatures and precipitation that could cause damage, as well as indirect impacts caused by changes in a project's environment, such as extreme heat or drought that could increase the likelihood of wildfires (Jiricka-Pürerer et al. 2018).

Extending this idea further, it is conceivable that environmental impact assessments could be adjusted to assess whether and how a proposed project



Canada is an outlier among OECD countries, many of which have long ago created an entity whose exclusive or primary purpose is to coordinate adaptation.

reduces climate change risks or enhances climate resilience. Farber (2009) argues such climate impact assessments would be most effective if they:

- ▶ are conducted by public officials, rather than outsourced to consultants, in order to build in-house expertise and buy-in;
- ▶ follow a standardized methodology to maximize comparability and to aggregate and synthesize information across assessments and over time;
- ▶ include provisions for follow-up after project initiation, to monitor climate-related impacts and ensure adaptation actions are implemented as planned; and,
- ▶ are made publicly available online and linked to a geographic information system, so they are searchable, accessible for secondary analysis by interested parties, and readily available to support follow-up.

Canadian governments have begun to harness policy and project appraisal processes to coordinate and mainstream adaptation. In 2011, for instance, Nova Scotia Environment published guidance for project proponents and public officials to consider climate change in provincial environmental assessment processes (Nova Scotia 2011). However, the climate change assessment is not mandatory and is framed as a tool to assist project proponents in considering their project's contributions to greenhouse gas emissions and the climate-related impacts their project might face. There is no standardized methodology, formal provisions for post-project follow-up, or publicly accessible database of assessments.

Environment and Climate Change Canada launched a Strategic Assessment of Climate Change (SACC) in 2020 that aimed to “enable consistent, predictable, efficient and transparent consideration of climate change throughout the impact assessment process” (Canada 2021c, 1). The SACC applies to all projects governed under the *Impact Assessment Act*. Project proponents must provide a plan to achieve net zero greenhouse gas emissions by 2050. Although emissions reduction is its primary focus, the SACC also requires project proponents to explain “how the project is resilient to and at risk from both the current and future impacts of a changing climate” (Canada 2021c, 15). SACC reports are prepared by project proponents (or consultants) and are reviewed by the Impact Assessment Agency of Canada. The process requires ongoing progress reporting after a project is initiated but does not appear to follow a standardized methodology. It is unclear whether assessment results will be made publicly accessible.



Canadian governments  
have begun to harness  
policy and project  
appraisal processes  
to coordinate and  
mainstream adaptation.



Another project appraisal tool is Infrastructure Canada's Climate Lens, launched in 2018 to promote the incorporation of climate change considerations into the design and planning of new infrastructure projects (Canada 2020a). The Climate Lens is a horizontal requirement that applies to all projects funded through three programs administered by Infrastructure Canada, including the Investing in Canada Infrastructure Program, the Disaster Mitigation and Adaptation Fund, and the Smart Cities Challenge. Its Climate Change Resilience Assessment component requires funding recipients to (1) identify potential climate risks to the project based on both historical climate data and future climate projections; (2) evaluate their likelihood, consequences, and potential impacts; and (3) identify risk management responses.

Although the Climate Lens includes a robust, standardized methodology and assessments have been conducted by professionals (e.g., engineers; planners), there are no apparent provisions for follow-up after project initiation, and assessment reports are not publicly accessible. Furthermore, a recent audit asserted that the Climate Lens tool was weakened in 2021 by the removal of the requirement for project proponents to submit detailed information and the professional attestation that information was prepared using recognized standards (Commissioner of the Environment and Sustainable Development 2022). The audit concluded that the changes have reduced Infrastructure Canada's ability to track the program's contribution towards meeting climate-related objectives.

Using *ex ante* appraisal tools to embed adaptation into decision making has a number of potential benefits. First, it induces those who propose new policies and projects to consider in advance how they might be affected by climate change and to design a plan to reduce or manage these risks before a decision is made. Second, the plans adopted to manage climate change risks offer valuable input for monitoring and evaluating adaptation efforts after policies and projects have been implemented. Finally, the use of appraisal tools could permanently alter the behaviour of project proponents and approval agencies so that they reflexively integrate adaptation measures that reduce climate risk.

There are also some potential limitations, however. If appraisal is used only after a policy is formulated or a project proposal is complete, then it might be too late in the process to revisit policy design options or adopt project alternatives. In addition, it might be difficult to predict climate change impacts on a particular policy or project, which could mean that the plan to adapt to these impacts would be only generic in nature, rather than specific and actionable.

## Monitor, evaluate, and report

No matter which tool is selected to induce adaptation policy coordination and mainstreaming, governments must also implement a robust scheme for monitoring departmental progress, evaluating its effectiveness, and reporting on results. Monitoring and evaluation offer important knowledge about how well adaptation efforts have been coordinated across departmental divides and how successfully climate resilience has been mainstreamed into policies, programs, and operations (Scott and Moloney 2022). Efforts to embed adaptation in government decision making evolve over time, so it is critical that monitoring and evaluation for these processes are included and well-resourced as part of Canada's National Adaptation Strategy from the beginning.

# 66

Monitoring and evaluation offer important knowledge about how well adaptation efforts have been coordinated across departmental divides and how successfully climate resilience has been mainstreamed.

Academic researchers have identified several potential indicators that are useful specifically for monitoring and evaluating the effectiveness of adaptation coordination and mainstreaming. These include:

- ▶ comprehensiveness, meaning the degree to which adaptation is routinely incorporated as a guiding principle in all stages of policymaking;
- ▶ aggregation, which refers to the extent to which climate resilience is used as a measure in policy evaluation; and,
- ▶ consistency, which refers to the degree to which climate resilience is prioritized as a principle to recognize and minimize contradictions between policies and programs (Rauken et al. 2014).

Some governments in Canada have already recognized the importance of monitoring and evaluation for climate policy. Saskatchewan's Climate Resilience Measurement Framework, for instance, mandates officials across 14 provincial ministries and agencies to track annual progress on 25 climate resilience measures (Saskatchewan 2018). Monitoring and evaluation frameworks rarely include tracking of policy coordination and mainstreaming, however, so incorporating these measures into monitoring and evaluation regimes would help to ensure adaptation is embedded in government decisions and actions.

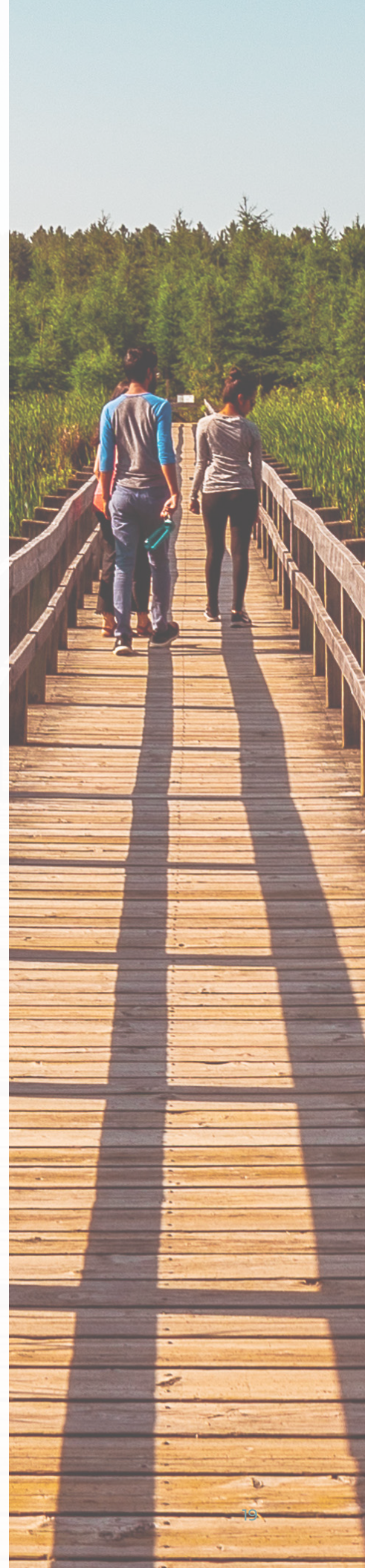


# CONCLUSION

Effective implementation of measures for climate adaptation hinges to a large extent on the capacity of governments to coordinate adaptation policies across departments and agencies and to mainstream adaptation objectives into policies, programs, and operations. Although adaptation has secured a prominent position in federal and provincial climate policy, both orders of government have struggled with horizontal coordination and mainstreaming of adaptation objectives over the past decade. It seems clear that overcoming the adaptation “implementation deficit” will require a clear, consistent political commitment, a strong, overarching governance structure, and robust monitoring, evaluation, and reporting requirements.

Canada’s forthcoming National Adaptation Strategy offers an opportunity to think critically about how established structures and processes can be adjusted to embed adaptation into government decisions and actions. This report has identified several potential approaches to this challenge, including enshrining adaptation in statute law, issuing an adaptation policy directive, establishing a central adaptation policy unit, and leveraging appraisal tools. All of these approaches have proven beneficial in supporting policy coordination and mainstreaming in other countries and policy fields, but they would need to be adapted to suit the structure and dynamics of public management in Canada.

*Published under a Creative Commons license by the Canadian Climate Institute. You are welcome to reproduce material in whole or part for non-commercial purposes, with a link to the original. Permission from copyright holders must be sought before any photographs are reproduced.*



# REFERENCES

- Auditor General of British Columbia. 2018. *Managing Climate Change Risks: An Independent Audit*. Victoria, BC: Office of the Auditor General of British Columbia.
- Auditor General of Canada. 2017. *Adapting to the Impacts of Climate Change*. Report of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada. Ottawa, ON: Office of the Auditor General. [http://www.oag-bvg.gc.ca/internet/English/parl\\_cesd\\_201710\\_02\\_e\\_42490.html](http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201710_02_e_42490.html)
- Auditor General of Canada. 2018. *Perspectives on Climate Change Action in Canada: A Collaborative Report from Auditors General*. Ottawa: Office of the Auditor General. [http://www.oag-bvg.gc.ca/internet/English/parl\\_otp\\_201803\\_e\\_42883.html](http://www.oag-bvg.gc.ca/internet/English/parl_otp_201803_e_42883.html)
- Auditor General of Canada. 2021. *Lessons Learned from Canada's Record on Climate Change*. Report of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada. Ottawa, ON: Office of the Auditor General. [https://www.oag-bvg.gc.ca/internet/docs/parl\\_cesd\\_202111\\_05\\_e.pdf](https://www.oag-bvg.gc.ca/internet/docs/parl_cesd_202111_05_e.pdf)
- Auditor General of Ontario. 2016. "Climate Change." In *2016 Annual Report of the Office of the Auditor General of Ontario, Volume 1*, 148–204. Toronto: Government of Ontario. [http://www.auditor.on.ca/en/content/annualreports/arreports/en16/v1\\_302en16.pdf](http://www.auditor.on.ca/en/content/annualreports/arreports/en16/v1_302en16.pdf)
- Averchenkova, Alina, Sam Fankhauser, and Jared J. Finnegan. 2021. "The Impact of Strategic Climate Legislation: Evidence from Expert Interviews on the UK Climate Change Act." *Climate Policy* 21 (2): 251–63.
- Bakvis, Herman, and Luc Juillet. 2004. *The Horizontal Challenge: Line Departments, Central Agencies and Leadership*. Ottawa, ON: Canada School of Public Service. <https://publications.gc.ca/collections/Collection/SC103-1-2004E.pdf>
- Barnett, Jon, and Saffron O'Neill. 2010. "Maladaptation." *Global Environmental Change* 20 (2): 211–13.
- Bauer, Anja, Judith Feichtinger, and Reinhard Steurer. 2012. "The Governance of Climate Change Adaptation in 10 OECD Countries: Challenges and Approaches." *Journal of Environmental Policy & Planning* 14 (3): 279–304.
- Bednar, Danny, Daniel Henstra, and Gordon McBean. 2019. "The Governance of Climate Change Adaptation: Are Networks to Blame for the Implementation Deficit?" *Journal of Environmental Policy & Planning* 21 (6): 702–17.
- Beugin, Dale, Jason Dion, Anna Kanduth, Caroline Lee, Dave Sawyer, and Jonathan Arnold. 2020. *Marking the Way: How Legislating Climate Milestones Clarifies Pathways to Long-Term Goals*. Ottawa: Canadian Climate Institute (formerly Canadian Institute for Climate Choices). <https://climatechoices.ca/wp-content/uploads/2020/06/CICC-climate-accountability-framework-FINAL.pdf>
- Bouwer, Laurens M., and Jeroen C.J.H. Aerts. 2006. "Financing Climate Change Adaptation." *Disasters* 30 (1): 49–63.
- Braunschweiger, Dominik, and Marco Pütz. 2021. "Climate Adaptation in Practice: How Mainstreaming Strategies Matter for Policy Integration." *Environmental Policy and Governance* 31 (4): 361–73.
- British Columbia. 2019. *Climate Change Accountability Act*. 2007 Statutes, Chapter 42. [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/07042\\_01](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/07042_01)
- British Columbia. 2021. *Core Policy & Procedures Manual*. 2021. <https://www2.gov.bc.ca/gov/content/governments/policies-for-government/core-policy>
- Burton, Ian. 1998. "Climate Adaptation Policies for Canada?" *Policy Options* 19 (4): 6–10.
- Canada. 2011. *Federal Adaptation Policy Framework*. Gatineau, QC: Environment Canada. [https://www.canada.ca/content/dam/eccc/migration/cc/content/2/b/2/2b2a953e-756b-4e8c-a2ba-3fbd3324dba/4214\\_federal-20adaptation-20policy-20framework\\_en.pdf](https://www.canada.ca/content/dam/eccc/migration/cc/content/2/b/2/2b2a953e-756b-4e8c-a2ba-3fbd3324dba/4214_federal-20adaptation-20policy-20framework_en.pdf)
- Canada. 2016. *Final Report of the Working Group on Adaptation and Climate Resilience*. Ottawa, ON: Pan-Canadian Framework on Clean Growth and Climate Change. [https://web.archive.org/web/20170330210717/http://www.climatechange.gc.ca/Content/6/4/7/64778DD5-E2D9-4930-BE59-D6DB7DB5CBC0/WG\\_Report\\_ACR\\_e\\_v5.pdf](https://web.archive.org/web/20170330210717/http://www.climatechange.gc.ca/Content/6/4/7/64778DD5-E2D9-4930-BE59-D6DB7DB5CBC0/WG_Report_ACR_e_v5.pdf)
- Canada. 2020a. *Climate Lens Quick Look*. Ottawa, ON: Infrastructure Canada. <https://www.infrastructure.gc.ca/alt-format/pdf/plan/cl-occ/cl-occ-brochure-eng.pdf>
- Canada. 2020b. *Greening Government Strategy: A Government of Canada Directive*. Treasury Board of Canada Secretariat. 2020. <https://www.canada.ca/en/treasury-board-secretariat/services/innovation/greening-government/strategy.html>
- Canada. 2021a. *Adapting to the Impacts of Climate Change in Canada: An Update on the National Adaptation Strategy*. Ottawa, ON: Government of Canada. <https://www.canada.ca/content/dam/eccc/documents/pdf/reports/report-update-national-adaptation-strategy.pdf>
- Canada. 2021b. *Minister of Environment and Climate Change Mandate Letter*. Ottawa: Office of the Prime Minister. <https://pm.gc.ca/en/mandate-letters/2021/12/16/minister-environment-and-climate-change-mandate-letter>
- Canada. 2021c. *Strategic Assessment of Climate Change*. Ottawa, ON: Environment and Climate Change Canada. <https://www.strategicassessmentclimatechange.ca/16736/widgets/65686/documents/40846>
- Canada. 2022. *About the Treasury Board Policy Suite*. Government of Canada. 2022. <https://www.tbs-sct.gc.ca/pol/info-eng.aspx>

- Centre for Environmental Risks and Futures. 2012. *Evaluating the Risk Assessment of Adaptation Reports under the Adaptation Reporting Power*. Cranfield, UK: Centre for Environmental Risks and Futures, Cranfield University. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/183427/annex-b-cranfield-uni-report-arp.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/183427/annex-b-cranfield-uni-report-arp.pdf)
- Commissioner of the Environment and Sustainable Development. 2022. *Funding Climate-Ready Infrastructure - Infrastructure Canada: Independent Auditor's Report*. Ottawa: Office of the Auditor General of Canada. <http://central.bac-lac.gc.ca/redirect?app=dampub&id=dbe6fbb2-3ac8-469f-afa5-2dc4a938817e>
- Council of Canadian Academies. 2022. *Building a Resilient Canada*. Ottawa, ON: Expert Panel on Disaster Resilience in a Changing Climate, Council of Canadian Academies. <https://cca-reports.ca/wp-content/uploads/2022/01/Building-a-Resilient-Canada-EN-Final-for-web.pdf>
- Craig, Robin Kundis. 2010. "'Stationarity Is Dead', Long Live Transformation: Five Principles for Climate Change Adaptation Law." *Harvard Environmental Law Review* 34 (1): 9–75.
- Croome, Julia, Catherine Abreu, Alan Andrews, Caroline Brouillette, Andrew Gage, Melissa Gorrie, Anna Johnston, and Tony Maas. 2020. *A New Canadian Climate Accountability Act: Building the Legal Foundation to Achieve Net-Zero Emissions by 2050*. Vancouver: Ecojustice, CANRac, West Coast Environmental Law, Equiterre, Environmental Defence, and Pembina Institute. <https://ecojustice.ca/wp-content/uploads/2020/06/Policy-Brief-New-Canadian-Climate-Accountability-Act-1.pdf>
- Cuevas, Sining C., Ann Peterson, Tiffany Morrison, and Catherine Robinson. 2016. "Methodology for Examining the Challenges in Mainstreaming Climate Change Adaptation." *International Journal of Climate Change Strategies and Management* 8 (3): 418–39.
- Dovers, Stephen R., and Adnan A. Hezri. 2010. "Institutions and Policy Processes: The Means to the Ends of Adaptation." *Wiley Interdisciplinary Reviews: Climate Change* 1 (2): 212–31.
- Dupuis, Johann, and Peter Knoepfel. 2013. "The Adaptation Policy Paradox: The Implementation Deficit of Policies Framed as Climate Change Adaptation." *Ecology and Society* 18 (4): 31–46.
- Farber, Daniel A. 2009. "Adaptation Planning and Climate Impact Assessments: Learning from NEPA's Flaws." *Environmental Law Reporter* 7: 10605–14.
- Feenan, Katherine, and Usman Mohammad. 2021. *Toward A National Adaptation Strategy: Roundtable Summary Report*. Ottawa, ON: Public Policy Forum. <https://ppforum.ca/wp-content/uploads/2021/08/Toward-a-National-Adaptation-Strategy-Summary-Paper-PPF-EN.pdf>
- Finland. 2017. *Seventh National Communication under the United Nations Framework Convention on Climate Change*. Helsinki: Ministry of the Environment and Statistics Finland. [https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/952371\\_Finland-NC7-1-fi\\_nc7\\_final.pdf](https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/952371_Finland-NC7-1-fi_nc7_final.pdf)
- Halpern, Charlotte, Sophie Jacquot, and Patrick Le Galès. 2008. *Mainstreaming: Analysis of a Policy Instrument*. Florence, IT: NewGov Project, European University Institute. <https://hal-sciencespo.archives-ouvertes.fr/hal-01066124/document>
- Hammill, Anne, Jo-Ellen Parry, Christian Ledwell, and Angie Dazé. 2021. *Toward a National Adaptation Strategy for Canada: Key Insights from Global Peers*. Winnipeg, MB: International Institute for Sustainable Development. <https://www.iisd.org/system/files/2021-06/national-adaptation-strategy-canada.pdf>
- Horne, Donald. 2013. "CMHC Insuring Practices Unaffected by Flood Risk." *Canadian Mortgage Professional*, June 27, 2013. <https://www.mpamag.com/ca/news/general/cmhc-insuring-practices-unaffected-by-flood-risk/279004>
- Jiricka-Pürner, Alexandra, Christina Czachs, Herbert Formayer, Thomas F. Wachter, Eva Margelik, Markus Leitner, and Thomas B. Fischer. 2018. "Climate Change Adaptation and EIA in Austria and Germany: Current Consideration and Potential Future Entry Points." *Environmental Impact Assessment Review* 71 (July): 26–40.
- Klein, Richard J. T., Siri E. H. Eriksen, Lars Otto Naess, Anne Hammill, Thomas M. Tanner, Carmenza Robledo, and Karen L. O'Brien. 2007. "Portfolio Screening to Support the Mainstreaming of Adaptation to Climate Change Into Development Assistance." *Climatic Change* 84 (1): 23–44.
- Lee, Seunghan, Jouni Paavola, and Suraje Dessai. 2022. "Towards a Deeper Understanding of Barriers to National Climate Change Adaptation Policy: A Systematic Review." *Climate Risk Management* 35 (January): 100414.
- Lemmen, Donald S., and Fiona J. Warren. 2004. *Climate Change Impacts and Adaptation: A Canadian Perspective*. Ottawa, ON: Natural Resources Canada.
- McDonald, Jan. 2011. "The Role of Law in Adapting to Climate Change." *WIREs Climate Change* 2 (2): 283–95.
- McKenzie, Janetta, and Jonas Kuehl. 2021. *Greater Than the Sum of Its Parts: How a Whole-of-Government Approach to Climate Change Can Improve Canada's Climate Performance*. Ottawa: Canadian Climate Institute (formerly Canadian Institute for Climate Choices). <https://climatechoices.ca/wp-content/uploads/2021/11/FINAL-Whole-of-Government-report-2021-Nov19.pdf>
- Mimura, Nobuo, Roger S. Pulwarty, Do Minh Duc, Ibrahim Elshinnawy, Margaret Hiza Redsteer, He-Qing Huang, Johnson Ndi Nkem, and Roberto A. Sanchez Rodriguez. 2014. "Adaptation Planning and Implementation." In *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, edited by Christopher B. Field, Vicente R. Barros, David Jon Dokken, Katharine J. Mach, Michael D. Mastrandrea, T. Eren Bilir, Monalisa Chatterjee, et al., 869–98. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University Press.
- Natural Resources Canada. 2013. *Adaptation Platform First Annual Report*. Ottawa, ON: Natural Resources Canada. [https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/adaptation/NRCAN\\_AdaptationAR-En\(Web\).pdf](https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/adaptation/NRCAN_AdaptationAR-En(Web).pdf)

- Nova Scotia. 2011. *Guide to Considering Climate Change in Project Development in Nova Scotia*. Halifax, NS: Nova Scotia Environment. <https://novascotia.ca/nse/ea/docs/Development.Climate.Change.Guide.pdf>
- Nova Scotia. 2021. *Environmental Goals and Climate Change Reduction Act, 2021 Statutes, Chapter 20 (Bill No. 57)*. [https://nslslegislature.ca/legc/bills/64th\\_1st/3rd\\_read/b057.htm](https://nslslegislature.ca/legc/bills/64th_1st/3rd_read/b057.htm)
- OECD. 2022. *The United Kingdom's Pioneering Climate Change Act*. Organisation for Economic Co-Operation and Development. 2022. <https://www.oecd.org/climate-action/ipac/practices/the-united-kingdom-s-pioneering-climate-change-act-c08c3d7a/>
- Ontario. 2020. *Enterprise Risk Management Directive*. Toronto, ON: Government of Ontario. 2020. <https://www.ontario.ca/page/enterprise-risk-management-directive>
- Page, Edward. 1985. "Laws as an Instrument of Policy: A Study in Central-Local Government Relations." *Journal of Public Policy* 5 (2): 241–65.
- Pal, Leslie. 2000. *There Ought To Be A Law! Instrument Choice: An Overview of the Issues*. RP02-10E. Strategic Issues Series RP02-10E. Ottawa, ON: Research and Statistics Division, Department of Justice, Government of Canada.
- Peters, B. Guy. 2013. "Toward Policy Coordination: Alternatives to Hierarchy." *Policy & Politics* 41 (4): 569–84.
- Peters, B. Guy. 2018. "The Challenge of Policy Coordination." *Policy Design and Practice* 1 (1): 1–11.
- Rauken, Trude, Per Kristen Mydske, and Marte Winsvold. 2014. "Mainstreaming Climate Change Adaptation at the Local Level." *Local Environment* 20 (4): 408–23.
- Runhaar, Hens, Bettina Wilk, Åsa Persson, Caroline Uittenbroek, and Christine Wamsler. 2018. "Mainstreaming Climate Adaptation: Taking Stock about 'What Works' from Empirical Research Worldwide." *Regional Environmental Change* 18 (4): 1201–10.
- Russel, Duncan, Sergio Castellari, Alessio Capriolo, Suraje Dessai, Mikael Hildén, Anne Jensen, Eleni Karali, et al. 2020. "Policy Coordination for National Climate Change Adaptation in Europe: All Process, but Little Power." *Sustainability* 12 (13): 5393.
- Russel, Duncan, and Andrew Jordan. 2009. "Joining up or Pulling Apart? The Use of Appraisal to Coordinate Policy Making for Sustainable Development." *Environment and Planning A: Economy and Space* 41 (5): 1201–16. <https://doi.org/10.1068/a4142>.
- Saskatchewan. 2018. *Saskatchewan's Climate Resilience Measurement Framework*. Regina: Government of Saskatchewan. <https://publications.saskatchewan.ca/api/v1/products/92479/formats/109479/download>
- Schaar, Johan. 2008. *Overview of Adaptation Mainstreaming Initiatives*. Stockholm: Commission on Climate Change and Development.
- Scott, Helen, and Susie Moloney. 2022. "Completing the Climate Change Adaptation Planning Cycle: Monitoring and Evaluation by Local Government in Australia." *Journal of Environmental Planning and Management* 65 (4): 650–74.
- United Kingdom. 2012. *UK Climate Change Risk Assessment 2012: Evidence Report*. London: UK Committee on Climate Change. [http://randd.defra.gov.uk/Document.aspx?Document=10067\\_CCRAEvidenceReport16July2012.pdf](http://randd.defra.gov.uk/Document.aspx?Document=10067_CCRAEvidenceReport16July2012.pdf)
- United Kingdom. 2013. *The National Adaptation Programme: Making the Country Resilient to a Changing Climate*. London: Department for Environment, Food & Rural Affairs. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/727259/pb13942-nap-20130701.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/727259/pb13942-nap-20130701.pdf)
- United Kingdom. 2016. *UK Climate Change Risk Assessment 2017: Synthesis Report*. London: UK Committee on Climate Change. <https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Synthesis-Report-Committee-on-Climate-Change.pdf>
- United Kingdom. 2018. *The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting*. London: Department for Environment, Food & Rural Affairs. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/727252/national-adaptation-programme-2018.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/727252/national-adaptation-programme-2018.pdf)
- United Kingdom. 2020a. *Accounting for the Effects of Climate Change: Supplementary Green Book Guidance*. London: Department for Environment, Food and Rural Affairs. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/934339/Accounting\\_for\\_the\\_Effects\\_Of\\_Climate\\_Change\\_-\\_Supplementary\\_Green\\_Book\\_...\\_pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/934339/Accounting_for_the_Effects_Of_Climate_Change_-_Supplementary_Green_Book_..._pdf)
- United Kingdom. 2020b. *Green Book: Central Government Guidance on Appraisal and Evaluation*. London: HM Treasury. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/938046/The\\_Green\\_Book\\_2020.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938046/The_Green_Book_2020.pdf)
- United Kingdom. 2020c. *The UK Climate Change Act*. CCC Insights Briefings, No. 1. London: UK Committee on Climate Change. <https://www.theccc.org.uk/wp-content/uploads/2020/10/CCC-Insights-Briefing-1-The-UK-Climate-Change-Act.pdf>
- Wamsler, Christine, and Stephan Pauleit. 2016. "Making Headway in Climate Policy Mainstreaming and Ecosystem-Based Adaptation: Two Pioneering Countries, Different Pathways, One Goal." *Climatic Change* 137 (1): 71–87.
- Wellstead, Adam, and Richard Stedman. 2014. "Addressing the Challenges of Adaptation to Climate Change Policy: Integrating Public Administration and Public Policy Studies." *International Journal of Public Administration* 37 (14): 999–1010.
- Widmer, Alexander. 2018. "Mainstreaming Climate Adaptation in Switzerland: How the National Adaptation Strategy Is Implemented Differently across Sectors." *Environmental Science & Policy* 82 (April): 71–78.
- Williams, Russell Alan, and Kathleen McNutt. 2013. "Climate Change Adaptation and Policy Capacity in the Canadian Finance Sector: A Meso Analysis." *Review of Policy Research* 30 (1): 91–113.