This report was originally written in French: the original document is available here.

This constitutes a **courtesy translation** by Dunsky, to facilitate its dissemination to anglophone audiences. It is not an official or professional translation.

**Final report**

# Benchmarking of climate action governance frameworks in Québec, North America and Europe

**Prepared for**

**Ministère de l'Environnement, de la Lutte contre les Changements Climatiques, de la Faune et des Parcs**
du Gouvernement du Québec

Ministry of the Environment, the Fight Against Climate Change, Wildlife and Parks of the Government of Québec, Canada (MELCCFP)

December 2023, Montréal

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GOVERNMENTS | UTILITIES | CORPORATE + NON-PROFIT

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# Executive summary

## The mandate

Compare governance frameworks for climate change mitigation in Québec, North America and Europe, particularly in terms of rigor, transparency and alignment of plans with targets.

*for the Ministère de l'Environnement, de la Lutte contre les Changements Climatiques, de la Faune et des Parcs du Québec (MELCCFP)*

## The underlying assumption

A sound climate governance framework helps deliver the action needed to limit global warming in an effective, sustainable and socially acceptable way.

## The approach

**88 jurisdictions** considered at the outset

**16 retained** for benchmarking, among the best and most relevant for Québec

**39 indicators** evaluated and compared

# What framework to govern climate action?

## The Challenge

**Net zero commitment**
by 2050

**-37.5% greenhouse gas emissions targeted**
by 2030 in Québec

**60% of this 2030 target**
covered by the current climate action plan

## The Findings

A good framework reduces the risks associated with climate action, but cannot fully eliminate them

1 **Québec's approach distinguishes itself** by the gradual roll-out of its plan (updated *every year*) and by its *exclusive* focus in its emission reduction modelling on existing, ratified and financed measures, excluding future planned measures.

2 **Québec has a clear and rigorous framework, ranking among the top 5** with a score of 77%. It stands out for its transparent accounting, its reporting, and its ring-fenced funding. It can improve further on the scope of its target, the medium-term visibility of its action plan, the timely monitoring of its GHG trajectory, the annual monitoring by the independent advisory committee, and the operationalization of "just transition" principles.

3 **Québec's gap (40%) between its existing measures and its target is slightly larger than the average gap**, estimated to be 37% for the 12/16 jurisdictions that model it (using various methodologies). Québec is one of only five cases to clearly highlight this gap in its communications, and among the most transparent in its modelling approach.

## The Recommendations for Québec

Develop & model two scenarios: *existing* and *planned* measures

Close the gap with the 2030 target and legally enshrine the 2050 target

+ 10 additional recommendations

## Methodological note

We carried out the analysis between August and October 2023, based on publicly available data.

Certain caveats apply:

- The development of any multi-criteria benchmarking framework involves some subjective decisions, linked to the selection and relative weighting of indicators. We have carried out a sensitivity analysis to increase our confidence in our results.
- Government data can be difficult to locate, even when it's publicly available. We have analysed what we could find after studying each case for 5 to 10 hours.
- Contextual differences often complicate direct comparisons, or their interpretation. Where relevant, we have expressed reservations in the report.

We encourage readers to retain the key messages and lessons, as much or more than the individual scores and rankings, which are of more relative accuracy.

# Cross-cutting findings

**Climate change mitigation action involves four fundamental risks**: *ambition* risk (inadequate targets), *planning* risk (a plan that doesn't meet the targets), *delivery* risk (not delivering the planned measures), and *impact* risk (delivered measures don't have the anticipated impact). These risks are explained in greater detail in section 4.1 of this report.

**Good climate governance - which respects certain basic principles* - can help contain these risks, but it can never fully eliminate them**. **Moreover, different governments prioritize the management of different risks**. For example, Québec minimizes *delivery risks* by including in its plan only those measures that have already been decided and financed, at the cost of lesser visibility on future measures. British Columbia takes the opposite approach, including a wide range of measures in its forward-looking plan, although not all have yet been validated, enshrined or detailed.

**Rigor (in accounting, reporting, modeling) is a virtue, but only insofar as it serves as a source of adjustment and learning.** When rigor becomes rigidity, it can slow down or distract from climate action, as observed in some jurisdictions. Some mechanisms, such as a vigorous and independent advisory committee, help to strike the right balance between the need for transparency and the costs of sometimes excessive and cumbersome "check-the-box" approaches.

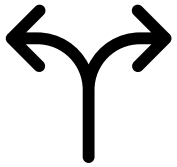
**There is no perfect way to track progress, as climate action is complex and data imperfect.** Action therefore needs to be monitored at various levels (modelled gap between measures and targets, output indicators, outcome indicators, actual GHG trajectory, and expenditure). Moreover, a balance needs to be struck between quantitative and qualitative monitoring.

**Climate action starts with good targets** which are clear, legally enshrined, comprehensive in scope (gases and sectors), aligned with international efforts and agreements, represent a fair share of the global effort, consider cumulative emissions, and are transparent about how "net" or negative emissions are treated.

* These basic principles are legislated targets, a detailed plan, regular monitoring and clear reporting. See also the framework presented in section 2 of this report.

# Does a better framework guarantee more progress?

**A good climate governance framework can bite.** Many governments have used their frameworks to inform difficult decisions (e.g., turn down of a liquefied natural gas terminal project in Ireland), identify and correct gaps in progress (e.g., gaps in the phase-out of oil heating and in the installation of vehicle charging infrastructure in Québec), and force the government to clarify and improve its plans (e.g., judgments by the German and British supreme courts). More generally, by offering transparency on progress and gaps, a good framework draws attention to any alterations in the planned and promised trajectory.



**However, the quality of the framework is not directly correlated with the pace of emissions reduction: this pace ultimately also depends on the nature of current emissions, evolving technology cost curves, and political will**. A framework, even a robust one, can be undone, as was the case in Ontario in 2018. Similarly, promised actions can be put off, as is the case with certain European governments which have recently postponed measures affecting the private sphere (heating, transport), which are more difficult to impose than the more centralized GHG reduction measures linked to decarbonizing electricity production.

**Political will, in turn, depends on the social and democratic acceptability of climate targets and measures**. A sound framework can contribute to bolstering acceptability by offering predictability, involving citizens and stakeholders in the development and implementation of plans, rigorously evaluating the effectiveness of measures and adjusting them accordingly, and integrating "just transition" considerations to fairly distribute the efforts and benefits of climate action. In this way, a sound framework contributes to making the ecological transition not a sacrifice, but a shared societal endeavour.

Benchmarking results

# Reviewed Jurisdiction Category Rankings

## LEADERS

**United Kingdom**
78%

**Ireland**
78%

**Québec**
77%


**California**
74%

**Germany**
72%

Governments with an **established**, **comprehensive**, **rigorous** and **transparent** framework

## ADVANCED

France
68%

New Zealand
66%

Canada
66%

British Columbia
62%

Finland
57%

Governments with a **complete** framework, but some **unclear areas or limitations**

## EMERGING

Maine
53%

New York
52%

Massachusetts
51%

New Brunswick
49%

Vermont
43%

Governments with a **serious**, but very recent framework, **to be tested** and completed

## Less active

Governments **without** ambitious **targets**, detailed **plans**, and/or regular **reporting**

47 jurisdictions that did not pass the first level of screening: *

In Canada: Alberta, Manitoba, Ontario**, Nunavut, Saskatchewan, Newfoundland and Labrador, Northwest Territories.

In the United States: Alabama, Alaska, Arizona, Arkansas, South Carolina, North Dakota, South Dakota, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, Ohio, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin, Wyoming.

In Europe: Greece, Lithuania.

In Australia: Australian Capital Territory, Tasmania, Northern Territory, South Australia.

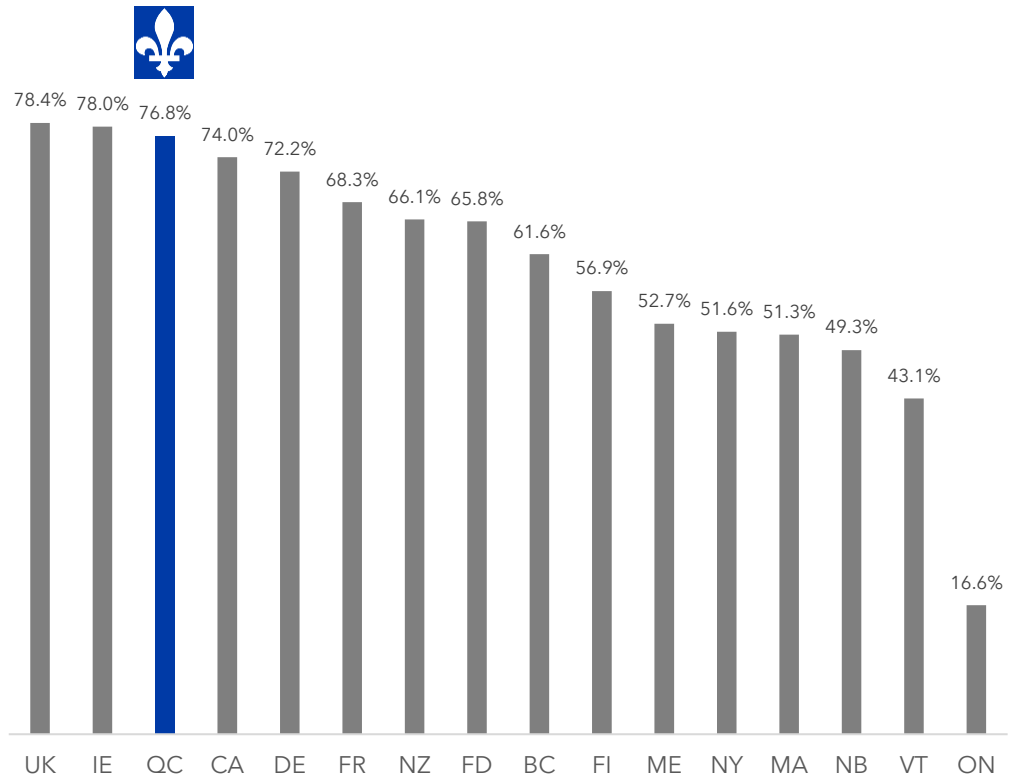
Note: Québec was evaluated based on a 5-10 hours of document review, as for the other cases. Subsequently, additional information provided by the MELCCFP was considered to finetune the recommendations for Québec. In the interest of fairness, however, this additional information was not considered in awarding the score and ranking presented here.

* A further 25 jurisdictions passed the initial screening, but were not included among the 16 governments selected for the full benchmarking, given resource constraints. It is therefore not possible to present them in this ranking. For more information on these cases and the process that led to their inclusion or exclusion from the benchmarking, see section 3.1 of this report and Appendix 6.1.

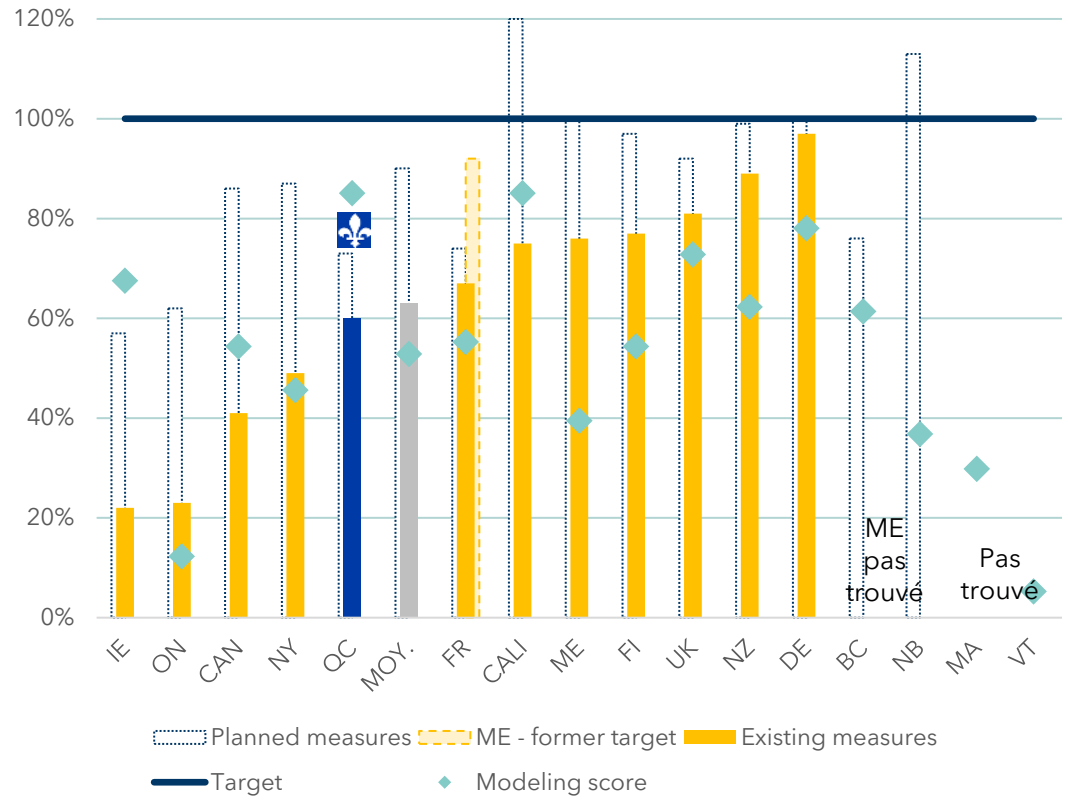
** Ontario did not pass the first screening, but was added to the benchmarking as the MELCCFP wished to include it for comparison purposes, see box on this subject.

# Québec earns a good score for its overall framework, and its existing measures cover 60% of its target based on rigorous modeling, just under the average.

## Overall score




Comparison of modelled GHG reductions by 2030 between existing measures only (EM) and existing and planned measures (PM), relative to each government's 2030 target.




Sources: left, score resulting from calibration by Dunsky. Right: Dunsky's calculations, based on modeling data from various governments.
Differences in methodology, ambition and economic structure between the cases complicate a direct comparison, but this represents our best interpretation and estimate.
The "modeling score" reflects the average score on dimension 3, "modeling", reflecting the rigor and transparency of the approach. See details of indicators 3.1 and 3.2 in section 4.2.

# Beyond its strengths, Québec has opportunities to improve further

Québec's framework scores well on most elements of the climate governance cycle and could further consolidate certain elements of its approach.


| Theme | % | Strengths | Improvement opportunities |
|---|---|---|---|
| **Governance** | 80% | • Climate action management process enshrined in the law<br>• Ring-fenced funding, with a coordinating entity | • Operationalisation of the just transition principle in the climate action framework |
| **Targets** | 48% | • Legislated 2030 target | • 2050 target legislated<br>• Sector carbon budgets<br>• LULUCF consideration<br>• Negative emissions strategy |
| **Plan** | 92% | • Clear, detailed plan, details by measure, updated annually | • Strategy to close the current 40% gap with the target |
| **Modeling** | 83% | • Transparent accounting and modeling | • Modelling of two scenarios - existing measures (EM) and planned measures (PM) |
| **Results** | 78% | • Almost 90% of actions have 'satisfactory progress' (2022) | • Reduction of delays in obtaining latest GHG data |
| **Follow-up & reporting** | 87% | • Detailed annual reporting and comprehensive online dashboard | • Overall qualitative progress assessment in each report |
| **Independent verification** | 67% | • Advisory Committee (AC) + Sustainable Development Commissioner (SDC) | • Requirement for annual AC report on overall progress |
| **Adjustment** | 80% | • Plan updated annually<br>• Obligatory response to SDC | • Obligation to respond to the advisory committee |

# Main report

# 1. Background

1.1 Research questions
1.2 Québec's climate framework: context
1.3 Project phases

The question

# How do jurisdictions structure and account for their climate action?

## Through this mandate, the MELCCFP wants to understand:

- Which North American governments have a **credible climate strategy**? *+ 3-5 Europe*
- How do these governments **account for** their climate actions, and report on their progress?
- What are the **best practices** in climate accounting and governance?

## This, in order to determine:

- How Québec **ranks** and **compares**
- What Québec can **learn** and **improve**

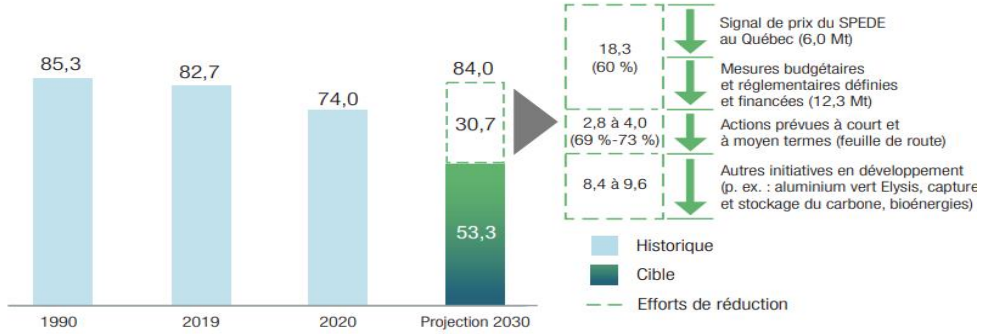

MELCCFP: Ministère de l'Environnement, de la Lutte contre les Changements Climatiques, de la Faune et des Parcs
(Ministry of the Environment, Climate Change, Wildlife and Parks of the Government of Québec)

# In Québec, climate action is updated annually, with current measures not yet sufficient to deliver on the 2030 target


In Québec, the measures in the current Implementation **Plan** (IP 2023-2028) account for **60%** of the effort required to reach the 2030 target of 53.3 Mt, i.e. 32 Mt less than in 1990 and 30.7 Mt less than the disengagement scenario.

In calculating the rate of achievement of its target, Québec only considers **existing measures** that have been **announced, approved and financed**. This rate has increased with each **annual update** of its plan since 2021.

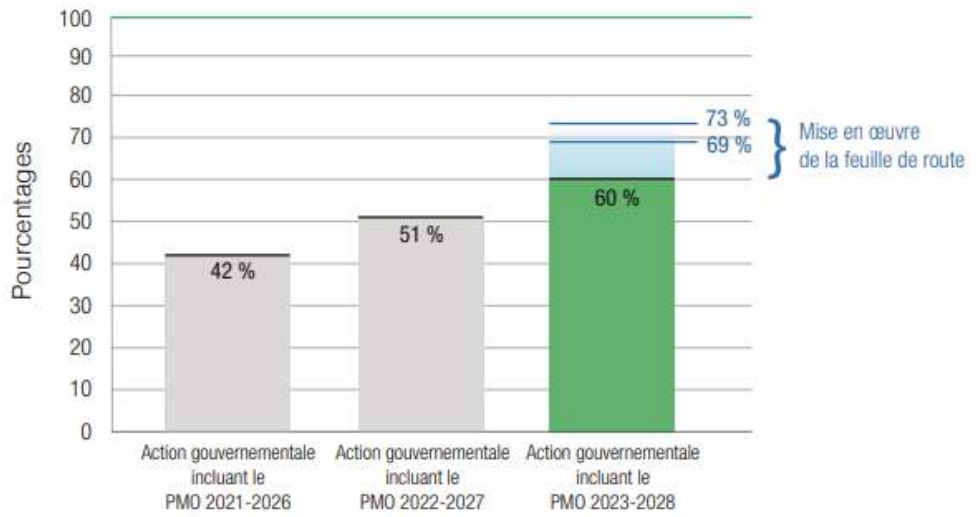
FIGURE 7
Évolution des émissions de GES et réductions nécessaires pour atteindre la cible de 2030 (en millions de tonnes équivalent $CO_2$)




Sources : Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs et ministère des Finances du Québec.

Note : Ces estimations sont basées sur les données les plus récentes disponibles au 10 mars 2023 ainsi que sur les prévisions économiques du budget 2023-2024. Il est supposé que les investissements dans la lutte contre les changements climatiques se poursuivront jusqu'en 2030 selon des paramètres semblables à ceux présentés pour la période 2021-2028.

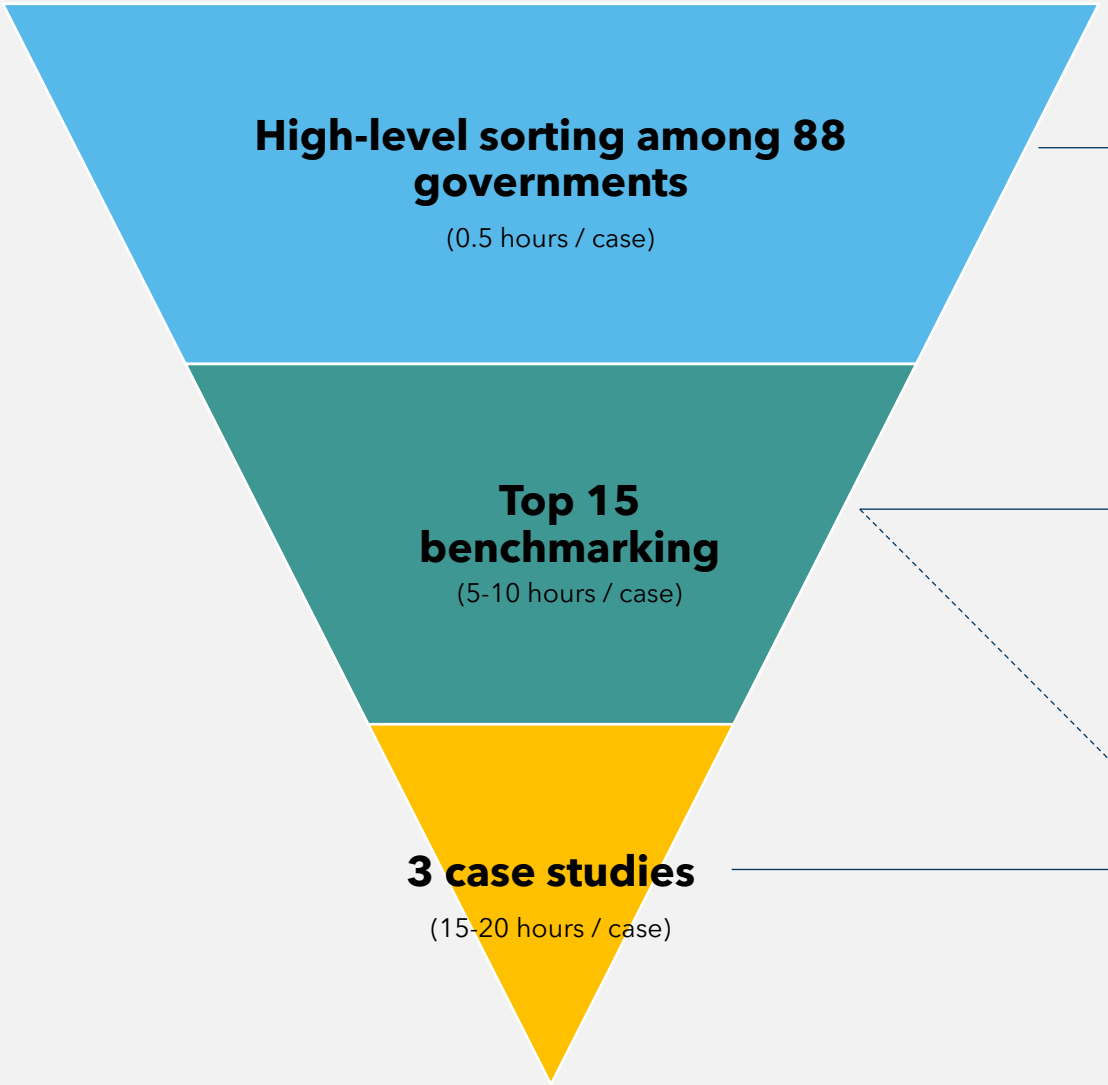
Évolution des prévisions du pourcentage d'atteinte de la cible en 2030




Source images: PMO 2023-2028, p.13 (left) and p.6 (right)

General approach

# To enable a comparison of both breadth and depth, the study uses a funnel approach, with three interrelated levels of analysis




## Scope of the analysis at each level

- **Context:** Which governments have legislated targets and a detailed climate plan?
- **Accounting:** How do governments account for GHG reduction measures?
- **Reporting :** How often do governments report on their progress? On what basis and by whom is progress measured and evaluated?
- **Financing:** What are the main methods and sources of financing for government climate action?
- **Governance:** How do governments structure and coordinate their high-level climate action?
- **Modeling:** What modeling is done, and is it credible (approaches, data quality, transparency of methodology, etc.)?

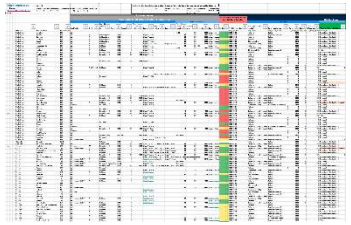
General approach

# The mandate was carried out in 6 stages between July and December

July-August

1. **Start-up** phase

2. High-level **sorting**



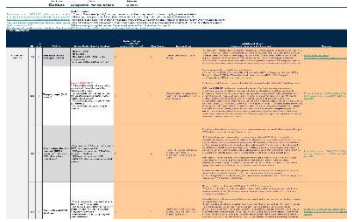
**88** governments

**40** pass the sorting

**16** selected

Late August - mid-October

3. **Document** review & **Calibration**



4. Inspiring case studies & **Interviews**


**624** individual scores awarded
(16 cases x 39 criteria)

Mid-October - mid-December

5. Analysis and preparation of **report**, version 1

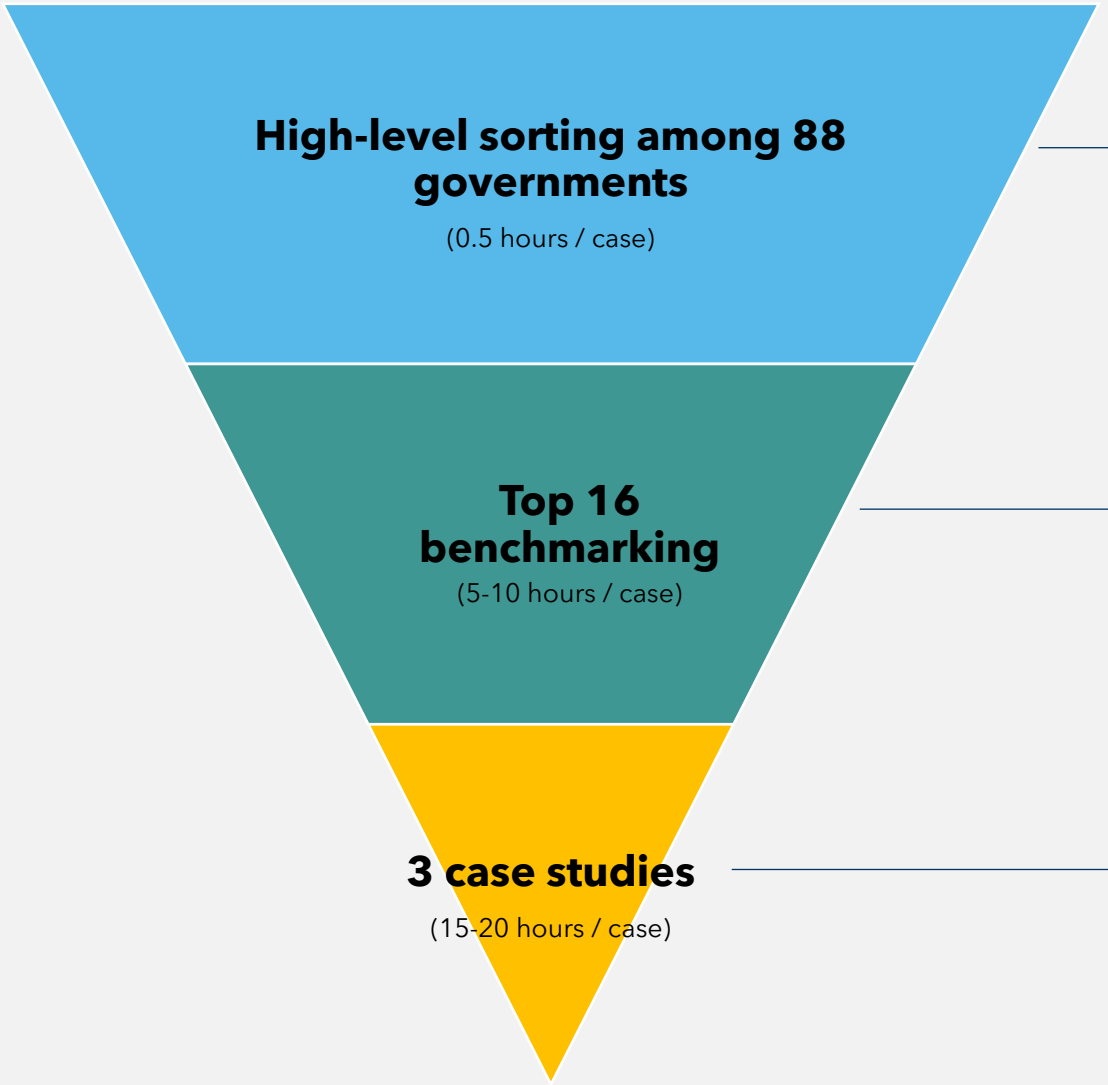
6. Discussions and **final report**

# 2. Methodology

2.1 Case selection approach
2.2 Governance assessment framework
2.3 Methodological notes and caveats

Sorting approach

# To carry out the study, we developed criteria for selecting, eliminating and comparing governments




A **first screening** eliminated all cases that do not have minimally ambitious targets enshrined in law, and a minimally detailed climate plan.

Then, a **high-level evaluation of** the remaining 40 cases based on 3 criteria (ambition, rigor, comparability with Québec) enabled us to select the 16 most relevant governments for the full benchmarking.

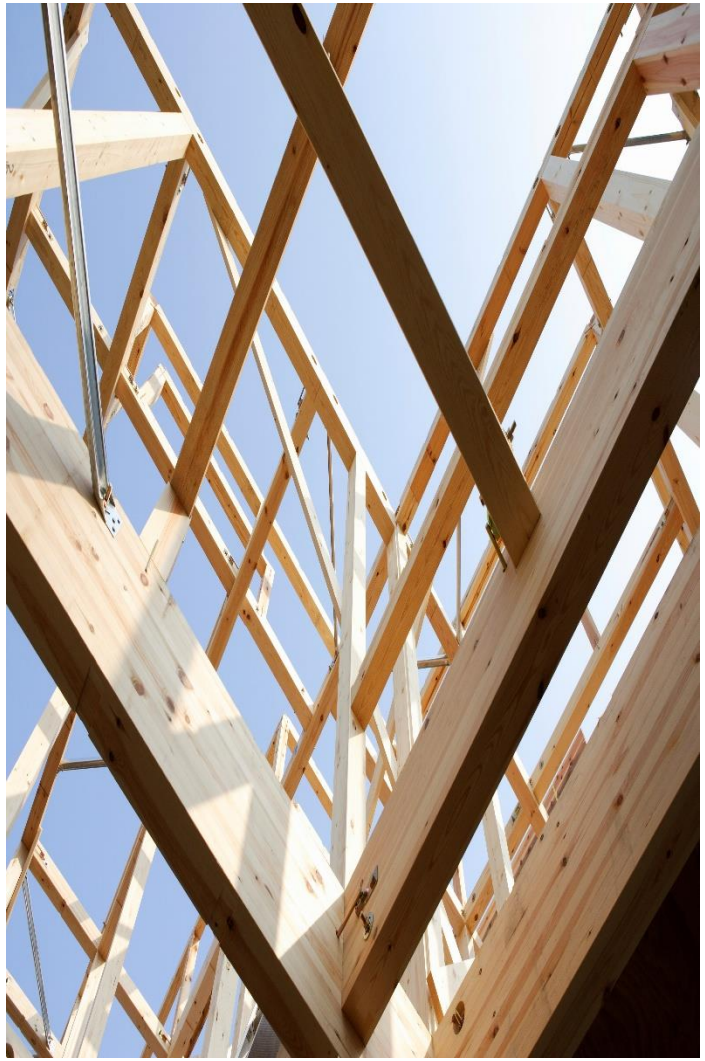
*Details of the criteria used are provided in appendix 6.1.*

In order to compare and rank the 16 governments, we conducted a **literature review** and **developed a benchmarking framework** consisting of five dimensions: foundations (targets and plan), governance, modeling, results, and societal considerations. We then assessed and scored each government on each of the 14 indicators and 39 sub-indicators.

*See remainder of this section for details.*

Finally, we **selected three** of the 15 **cases** for in-depth analysis, including an **interview** with the government entity responsible for climate action. For scheduling reasons, this selection was made before the benchmarking was finalized, and is therefore not necessarily aligned with the final scores. The selection targeted one case per region (United States, Canada, Europe), giving priority to those with long-established frameworks, to be able to observe their effects and evolution.

# What do we mean by "climate governance framework"?



- A climate governance framework refers to **the set of structures**, **policies**, **processes** and **mechanisms** that guide the way **decisions** are made, **implemented** and **monitored** to mitigate climate change, primarily (for this mandate) by limiting greenhouse gas (GHG) emissions.
- Ideally, this framework is **enshrined in law**. Its aim is to make climate action **intelligible**, **coherent** and **transparent**, thus ensuring **traceability** and **accountability**, and ultimately promoting its **effectiveness** and **impact**.
- A comprehensive framework clearly spells out the **why** (the objectives of climate action, such as targets detailing "how much" and "by when"), the **who** (who is responsible for achieving the objectives), and the **how** (the planned measures, but also expectations for planning, modeling, coordination, financing, and reporting).
- A good framework makes it possible not only to understand what is being done, but also to compare (a) what is **needed** to achieve objectives (overall and for each sector or measure), (b) what is **planned**, (c) what has been **achieved** in terms of both outputs and impacts, and (d) the **gaps** between these various elements. In this way, it allows stakeholders to determine on an ongoing basis whether plans, objectives and results are in line with one another, and to implement adjustments as required.
- Sound climate governance framework is important because climate change mitigation efforts affect **many sectors** (and ministries and levels of administration), and ultimately involves a **profound economic transformation**. It is therefore important to establish a high-level governance architecture that goes beyond isolated programs or projects.
- The following pages present the multi-criteria benchmarking framework developed for this mandate, which brings together the various elements mentioned above. We also present some of the other frameworks that inspired it.

Source: Dunsky, inspired by other studies, see next page.

Calibration frame

# Elements considered for calibration

**5 dimensions**

**14 indicators**

**39 sub-indicators**

The **weighting** was established according to our professional judgment before we began the detailed research and scoring of each case, and was not modified along the way.

A sensitivity analysis of the results with alternative weightings is presented in Appendix 3. As it shows, changes to the final ranking are limited.

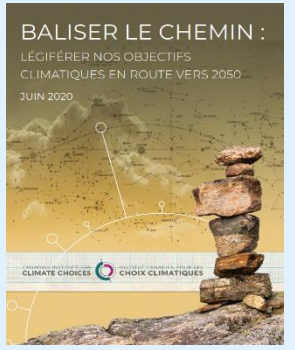
| Dimension | Indicator | Sub-indicators | Weighting |
|---|---|---|---|
| **1. FOUNDATIONS** (20%) | 1.1 Targets and ambitions | **4** | 4% |
| | 1.2 Intermediate targets | **3** | 3% |
| | 1.3 Binding targets | **1** | 1% |
| | 1.4 Climate action plan | **5** | 12% |
| **2. GOVERNANCE & ACCOUNTABILITY** (30%) | 2.1 Reporting mechanisms | **5** | 16% |
| | 2.2 Whole-of-government approach | **1** | 2% |
| | 2.3 Independent review | **2** | 6% |
| | 2.4 Financing mechanisms | **2** | 6% |
| **3. MODELING** (30%) | 3.1 Gap between expected emission reductions and targets | **4** | 17% |
| | 3.2 Emissions modeling | **4** | 13% |
| **4. PROGRESS** (10%) | 4.1 Implementation progress | **1** | 5% |
| | 4.2 Emissions reduction progress | **1** | 5% |
| **5. SOCIAL CONSIDERATIONS** (10%) | 5.1 Stakeholder engagement | **1** | 3% |
| | 5.2 Holistic climate planning | **2** | 7% |

## How did we develop this framework?

To develop this framework, we reviewed the recent literature on good climate governance, in particular the following two studies:

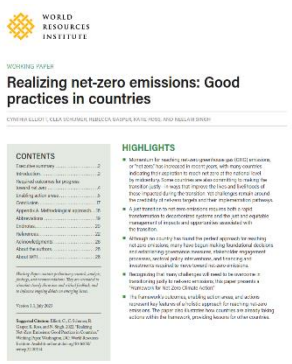
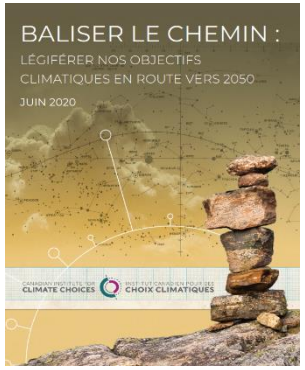
- Setting the course: Legislating our climate goals on the road to 2050, Climate Institute of Canada, June 2020
- Realizing Net-Zero Emissions: Good Practices in Countries, World Resources Institute, June 2023

We then synthesized our research and developed a preliminary framework for discussion internally and with our client (MELCCFP), resulting in the final framework shown here. See also next slide.

# Our framework is inspired by existing frameworks

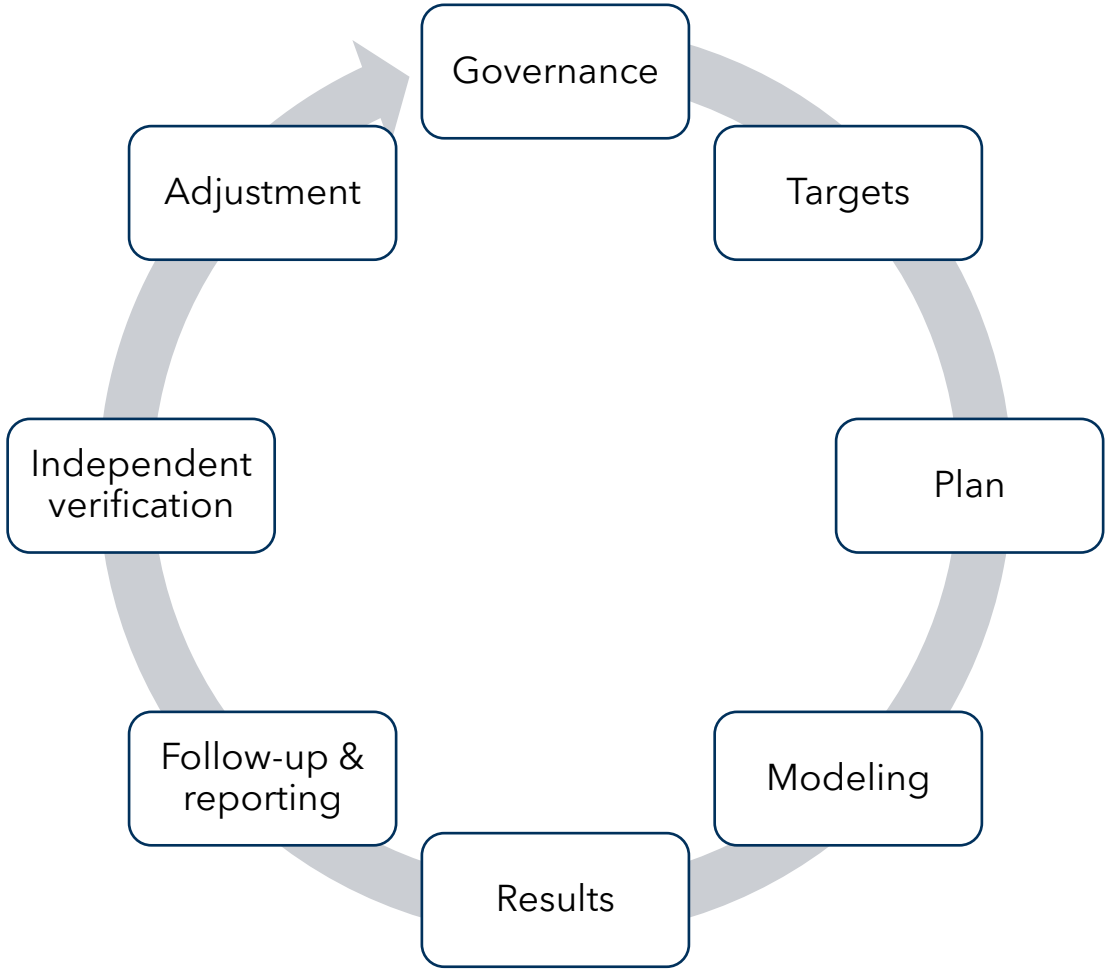
In light blue: elements included in the framework developed by Dunsky for this report

| Frameworks | Principles of sound climate governance set out in these frameworks |
|---|---|
|  | **Make fundamental decisions**: define the timing and scope of the net zero target + set short-term and sectoral targets + incorporate targets into law + model trajectories to achieve the net zero target + consider the role of negative emissions + develop a holistic implementation plan, including just transition considerations. |
| | **Establish governance:** promote political leadership + strengthen accountability through regular monitoring and reporting + ensure internal coordination for implementation + examine the roles of judicial and executive authorities. |
| | **Engage stakeholders**: include public input in decision-making processes + strategically identify and involve key vulnerable stakeholders + establish independent expert committees to review policies and implementation plans and hold governments to account + carry out targeted actions to encourage the private sector to adopt net zero. |
| | **Implement sectoral policies**: establish short-term policies and actions to achieve future objectives (combination of incentives and sectoral regulations). |
| | **Align financing and investment:** align fiscal policy with the net-zero target + increase domestic public climate financing + mobilize and support private climate financing + align international public financing with climate objectives. |
|  | **Formalize climate governance structures and processes**: legislate structures, processes and long-term objectives |
| | **Clearly define roles and responsibilities**: guarantee independent advice and evaluation + support a whole-of-government approach |
| | **Setting intermediate emission reduction milestones**: clear, codified rules on how they are set and updated + milestones set 10 to 15 years in advance + cumulative carbon budgets |
| | **Develop action plans to meet milestones**: link progress or lack of progress to mandatory trajectory corrections (revised plans and policies to address excess emissions) |
| | **Require follow-up and reporting**: demand formal responses to independent advisory committees, require progress and evaluation reports |
| | **Broaden the scope beyond emissions reduction**: formally integrate adaptation and clean growth, as well as social and cultural issues. |

Climate action governance cycle

# Our five dimensions can also be represented in the form of a climate action governance cycle

| Dimension | Indicator | Theme |
|---|---|---|
| **1. FOUNDATIONS** (20%) | 1.1 Targets and ambitions | **Targets** |
| | 1.2 Intermediate targets | **Targets** |
| | 1.3 Binding targets | **Targets** |
| | 1.4 Climate action plan | **Plan** |
| **2. GOVERNANCE & ACCOUNTABILITY** (30%) | 2.1 Reporting mechanisms | **Follow-up & reporting + Adjust. #5** |
| | 2.2 Whole-of-government approach | **Governance** |
| | 2.3 Independent review | **Ind. Verif. + Adjust. #2** |
| | 2.4 Financing mechanisms | **Governance** |
| **3. MODELING** (30%) | 3.1 Gap between expected emission reductions and targets | **Modeling** |
| | 3.2 Emissions modeling | **Modeling** |
| **4. PROGRESS** (10%) | 4.1 Implementation progress | **Results** |
| | 4.2 Emissions reduction progress | **Results** |
| **5. SOCIAL CONSIDERATIONS** (10%) | 5.1 Stakeholder engagement | **Governance** |
| | 5.2 Holistic climate planning | **Governance** |



# Every benchmarking exercise has its limits

## We conducted the analysis between August and October 2023, based on publicly available data. Certain caveats apply:

- The development of any framework involves some **subjectivity**, linked to the selection and relative weighting of indicators. In particular, the framework has been developed and calibrated in part to reflect areas of interest to the MELCCFP, which in some cases coincide with areas where Québec is performing relatively well. Nevertheless, we made sure to develop a framework based on general good practices, whether present in Québec or not, and to perform a sensitivity analysis to increase our confidence in our results.
- The **data** for some cases can be **hard to find**, even when public. We have retained what could be identified by studying each case for 5-10 hours. The scores may thus not always fully reflect a jurisdiction's reality, but at least measure the clarity and transparency of its documentation.
- **Contextual differences** often complicate direct comparisons, or even their interpretation. Where this is the case, we have expressed reservations in the report.

### Elements to be reviewed in a future study

Some additional elements were either out of scope for our study, or emerged during the study, too late to integrate them fully. For future editions of this study, we recommend:

- **Foundations**: more formal comparison of governments' levels of ambition, and assessment of the societal cost of the plan
- **Progress**: More formal comparison of governments' recent GHG reduction trajectories
- **Governance**: Assessment of the extent to which climate transition is part of the mandate of key entities (e.g. regulatory agencies, energy system operators).
- **Other countries**: inclusion of non-Western countries in the study (e.g. Japan, Costa Rica, Mexico, etc.).

# 3. Results

3.1 Cases selected for the benchmarking
3.2 Benchmarking results for the 16 jurisdictions

# 3. Results

3.1 Cases selected for the benchmarking

3.2 Benchmarking results for the 16 jurisdictions

Case selection results

# 16 cases selected from 40 that pass the sorting

| Region | Initial list<br>50 United States, 13 Canada (+ QC), 15 Europe, 9 Oceania | 40 pass the elimination test<br>16 United States, 6 Canada + QC, 13 Europe, 4 Oceania | 15 selected + QC<br>*3 case studies ** |
|---|---|---|---|
| **Canada**<br>All provinces (10), territories (3), and federal (1) | • Alberta, British Columbia, Prince Edward Island, Manitoba, New Brunswick, Nova Scotia, Nunavut, Ontario, Québec, Saskatchewan, Newfoundland and Labrador, Northwest Territories, Yukon.<br>• Federal | • ~~Alberta~~, British Columbia, Prince Edward Island, ~~Manitoba~~, New Brunswick, Nova Scotia, ~~Nunavut~~, ~~Ontario~~, Québec, ~~Saskatchewan~~, ~~Newfoundland and Labrador~~, ~~Northwest Territories~~, Yukon.<br>• Federal | • Québec<br>• *British Columbia **<br>• Federal<br>• New Brunswick<br>• Ontario *(see next page)* |
| **United States**<br>All states (50) | • Alabama, Alaska, Arizona, Arkansas, California, North Carolina, South Carolina, Colorado, Connecticut, North Dakota, South Dakota, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, New Mexico, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Washington, Wisconsin, Wyoming. | • ~~Alabama~~, ~~Alaska~~, ~~Arizona~~, ~~Arkansas~~, California, North Carolina, ~~South Carolina~~, Colorado, Connecticut, ~~North Dakota, South Dakota~~, ~~Delaware~~, ~~Florida~~, ~~Georgia,~~ Hawaii, ~~Idaho, Illinois~~, ~~Indiana~~, ~~Iowa~~, ~~Kansas~~, ~~Kentucky~~, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, ~~Mississippi~~, ~~Missouri, Montana~~, ~~Nebraska~~, Nevada, ~~New Hampshire~~, New ~~Jersey, New~~ York, ~~New Mexico, Ohio, Oklahoma~~, Oregon, ~~Pennsylvania~~, ~~Rhode Island, Tennessee, Texas, Utah,~~ Vermont, ~~Virginia~~, ~~West Virginia~~, Washington, ~~Wisconsin~~, ~~Wyoming~~. | • *California **<br>• Maine<br>• Massachusetts<br>• New York<br>• Vermont |
| **Europe and Oceania**<br>15 European countries<br>8 Australian states<br>+ New Zealand | • Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Lithuania, Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom<br>• Australian Capital Territory, New South Wales, Tasmania, Northern Territory, Queensland, South Australia, Victoria,<br>• New Zealand | • Denmark, Finland, France, Germany, ~~Greece~~, Iceland, Ireland, Italy, ~~Lithuania~~, Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom<br>• ~~Australian Capital Territory~~, New South Wales, ~~Tasmania~~, ~~Northern Territory~~, Queensland, ~~South Australia~~, Victoria,<br>• New Zealand | • Germany<br>• Finland<br>• France<br>• Ireland<br>• *United Kingdom **<br>• New Zealand |

Discussion

# Zoom

ZOOM

## Can benchmarked jurisdictions be compared to non-benchmarked ones?

## And - why was Ontario included in the full benchmarking, despite failing the screening?

**In principle, the benchmarking focuses on the 16 jurisdictions suspected of being the "best"**, selected among the 40 jurisdictions which passed the initial screening. The selection of 16 from 40 was partly based on a high-level quantitative assessment (see appendix 6.1 for details), but the results thereof where not strictly followed, for several reasons: (a) to avoid cases too different from Québec, such as Prince Edward Island, (b) to avoid too many similar cases, such as three Scandinavian countries, (c) to include cases to which Québec tends to compare itself against, such as New York, Massachusetts and Ontario, and (d) to recognize that initial screening criteria are high-level and, like any scale, contain an element of arbitrariness.

Consequently, it's **not possible to formally conclude that the 16 benchmarked jurisdictions perform better than the 23 not selected after the first screening**, since these 23 were not formally evaluated on the same full benchmarking criteria. It would therefore be possible - but not proven - that, for example, Minnesota (not retained in the final 16) would have scored higher than Maine (retained), had it been evaluated. Nevertheless, we are confident that the 16 benchmarked cases include at least half of the top 15 governments among the initial 88.

**Ontario** in particular was selected even though the province did not meet the criteria to pass the first screening. The reason for its inclusion is mainly contextual: since Ontario and Québec are neighbors of similar size, frequently compared, our client the MELCCFP deemed Ontario worthwhile to include in the benchmarking, despite it having a less developed climate governance framework (at the moment - Ontario had a more developed framework before 2018, but as it is no longer in force, this assessment does not consider it). Ontario's position in the final ranking must therefore be interpreted with nuance, as it was not included on the same basis as the other benchmarked cases, and even though its scoring was carried out on the same basis. Ontario's score is particularly "visible", being often towards the bottom of the detailed comparison (see next part of this report), even though Ontario is not alone in its climate approach: 47 other governments out of the 88 studied were, like Ontario, excluded after the first screening for lack of ambitious decarbonization targets and/or a detailed climate plan to achieve them. Had all 88 cases been included in the full benchmarking, Ontario would not necessarily have found itself at the bottom of the table.

Comparing contexts

# Contexts vary - and Québec does not have the lowest absolute emissions, except in the power generation sector.

Key findings

- **Québec emits fewer GHGs per capita** than its Canadian neighbors, but **more than** most European countries
- **The carbon intensity of Québec's electricity is low**, limiting Québec's opportunities for decarbonization in this area, while other cases rely heavily on this sector (NB, UK, DE). That said, some other jurisdictions have a similar profile to QC (ON, BC, VT).
- **11/16 cases have transportation as the primary source of** GHGs, like Québec.

| | Case | 2030 target | GHG / inhabitant (T. $CO2_e$, 2021) | Main source of emissions | Intensity gCO2e / kWh | GDP per capita (k, CAD$) | Population (millions) |
|---|---|---|---|---|---|---|---|
| Canada | Québec | -37,5%, 2030/1990 | 9,0 | Transport | 1,7 | 66,0$ | 8,6 |
| | Canada | -40/-45%, 2030/2005 | 20,4 | Transport | 110 | 73,6$ | 38,2 |
| | BC | -40%, 2030/2007 | 11,4 | Transport | 15 | 78,7$ | 5,2 |
| | Ontario | -30%, 2030/2005 | 10,1 | Transport | 30 | 70,6$ | 14,8 |
| | NB | -46%, 2030/2005 | 15,0 | Electricity | 300 | 66.1$ | 0,8 |
| US | California | -40%, 2030/1990 | 10,1 | Transport | 169 | 128,0$ | 39,1 |
| | Maine | -40%, 2030/1990 | 11,7 | Transport | 160 | 87,5$ | 1,4 |
| | Massachusetts | -50%, 2030/1990 | 8,9 | Transport | 347 | 136,8$ | 7,0 |
| | New York | -40%, 030/1990 | 9,4 | Transport | 216 | 140,9$ | 19,9 |
| | Vermont | -40%, 2030/1990 | 12,6 | Transport | 4,0 | 88,2$ | 0,65 |
| Other | Germany | -65%, 2030/1990 | 9,1 | Electricity | 439 | 67,3$ | 84,2 |
| | France | -55%, 2030/1990 | 6,2 | Transport | 61 | 56,9$ | 68,2 |
| | Finland | -60%, 2030/1990 | 8,6 | Electricity | 169 | 70,0$ | 5,6 |
| | Ireland | -51%, 2030/2018 | 12,4 | Agriculture | 376 | 144,5$ | 5,2 |
| | UK | -68%, 2030/1990 | 7,3 | Transport | 252 | 63,7$ | 68,1 |
| | NZ | -30%, 2030/2005 | 13,4 | Agriculture | 96 | 67,0$ | 5,1 |

Sources: see appended table.

# 3. Results

3.1 Cases selected for the benchmarking

3.2 Benchmarking results for the 16 jurisdictions

Benchmarking results

# Reviewed Jurisdiction Category Rankings

## LEADERS

**United Kingdom**
78%

**Ireland**
78%

**Québec**
77%


**California**
74%

**Germany**
72%

Governments with an **established**, **comprehensive**, **rigorous** and **transparent** framework

## ADVANCED

France
68%

New Zealand
66%

Canada
66%

British Columbia
62%

Finland
57%

Governments with a **complete** framework, but some **unclear areas or limitations**

## EMERGING

Maine
53%

New York
52%

Massachusetts
51%

New Brunswick
49%

Vermont
43%

Governments with a **serious**, but very recent framework, **to be tested** and completed

## Less active

Governments **without** ambitious **targets**, detailed **plans**, and/or regular **reporting**

47 jurisdictions that did not pass the first level of screening: *

In Canada: Alberta, Manitoba, Ontario**, Nunavut, Saskatchewan, Newfoundland and Labrador, Northwest Territories.

In the United States: Alabama, Alaska, Arizona, Arkansas, South Carolina, North Dakota, South Dakota, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, Ohio, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin, Wyoming.

In Europe: Greece, Lithuania.

In Australia: Australian Capital Territory, Tasmania, Northern Territory, South Australia.

Note: Québec was evaluated based on a 5-10 hours of document review, as for the other cases. Subsequently, additional information provided by the MELCCFP was considered to finetune the recommendations for Québec. In the interest of fairness, however, this additional information was not considered in awarding the score and ranking presented here.

* A further 25 jurisdictions passed the initial screening, but were not included among the 16 governments selected for the full benchmarking, given resource constraints. It is therefore not possible to present them in this ranking. For more information on these cases and the process that led to their inclusion or exclusion from the benchmarking, see section 3.1 of this report and Appendix 6.1.

** Ontario did not pass the first screening, but was added to the benchmarking as the MELCCFP wished to include it for comparison purposes, see box on this subject.

Full ranking

# Europeans are strong, the U.S. less so, Canada is scattered

Québec achieves its **best average score in the dimensions of modeling** and **governance & accountability**.
Its scores are a little lower, but satisfactory, for foundations, progress and societal considerations.

| Region | Case | Total score as a percentage of maximum possible | Acronyms | 1. Foundations (20%) | 2. Governance & accountability (30%) | 3. Modeling (30%) | 4. Progress (10%) | 5. Societal considerations (10%) |
|---|---|---|---|---|---|---|---|---|
| EUROPE | **United Kingdom** | **78,4%** | **UK** | 76% | 89% | 73% | 68% | 78% |
| EUROPE | **Ireland** | **78,0%** | **IE** | 81% | 90% | 68% | 55% | 89% |
| CANADA | **Québec** | **76,8%** | **QC** | 75% | 77% | 85% | 65% | 67% |
| UNITED STATES | **California** | **74,0%** | **CAL** | 79% | 69% | 85% | 50% | 72% |
| EUROPE | **Germany** | **72,2%** | **DE** | 83% | 73% | 78% | 68% | 33% |
| EUROPE | **France** | **68,3%** | **FR** | 72% | 82% | 55% | 55% | 72% |
| OCEANIA | **New Zealand** | **66,1%** | **NZ** | 80% | 74% | 62% | 13% | 78% |
| CANADA | **Canada (Federal)** | **65,8%** | **CAN** | 83% | 64% | 54% | 38% | 100% |
| CANADA | **British Columbia** | **61,6%** | **BC** | 70% | 54% | 61% | 68% | 61% |
| EUROPE | **Finland** | **56,9%** | **FI** | 69% | 53% | 54% | 38% | 72% |
| UNITED STATES | **Maine** | **52,7%** | **ME** | 59% | 55% | 39% | 38% | 89% |
| UNITED STATES | **New York (State)** | **51,6%** | **NY** | 75% | 43% | 46% | 0% | 100% |
| UNITED STATES | **Massachusetts** | **51,3%** | **MA** | 76% | 46% | 30% | 50% | 83% |
| CANADA | **New Brunswick** | **49,3%** | **NB** | 59% | 49% | 37% | 90% | 28% |
| UNITED STATES | **Vermont** | **43,1%** | **VY** | 71% | 51% | 5% | 20% | 100% |
| CANADA | **Ontario** | **16,6%** | **ON** | 18% | 9% | 12% | 38% | 28% |

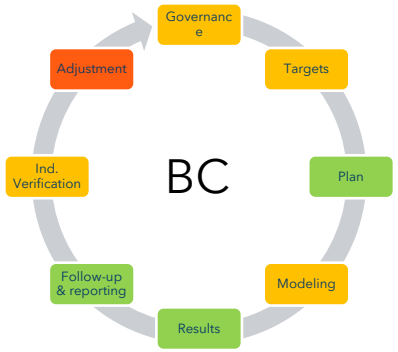
# Beyond its strengths, Québec has opportunities to improve further

Québec's framework scores well on most elements of the climate governance cycle and could further consolidate certain elements of its approach.


| Theme | % | Strengths | Improvement opportunities |
|---|---|---|---|
| **Governance** | 80% | • Climate action management process enshrined in the law<br>• Ring-fenced funding, with a coordinating entity | • Operationalisation of the just transition principle in the climate action framework |
| **Targets** | 48% | • Legislated 2030 target | • 2050 target legislated<br>• Sector carbon budgets<br>• LULUCF consideration<br>• Negative emissions strategy |
| **Plan** | 92% | • Clear, detailed plan, details by measure, updated annually | • Strategy to close the current 40% gap with the target |
| **Modeling** | 83% | • Transparent accounting and modeling | • Modelling of two scenarios - existing measures (EM) and planned measures (PM) |
| **Results** | 78% | • Almost 90% of actions have 'satisfactory progress' (2022) | • Reduction of delays in obtaining latest GHG data |
| **Follow-up & reporting** | 87% | • Detailed annual reporting and comprehensive online dashboard | • Overall qualitative progress assessment in each report |
| **Independent verification** | 67% | • Advisory Committee (AC) + Sustainable Development Commissioner (SDC) | • Requirement for annual AC report on overall progress |
| **Adjustment** | 80% | • Plan updated annually<br>• Obligatory response to SDC | • Obligation to respond to the advisory committee |

# Scoring summary for the 16 benchmarked jurisdictions





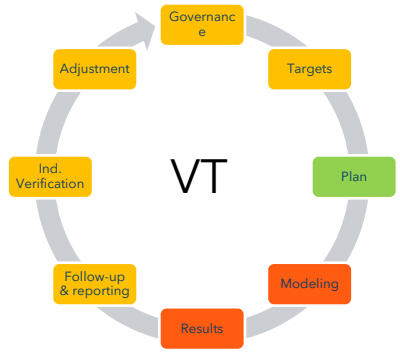




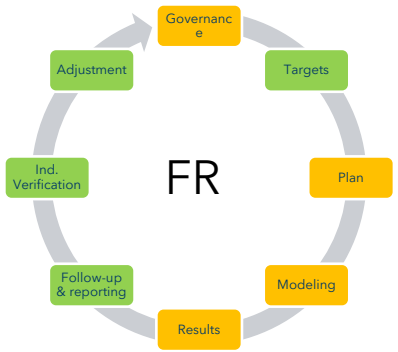
**Green >= 67%**
**Yellow = 34% to 66%**
**Red <= 33%**

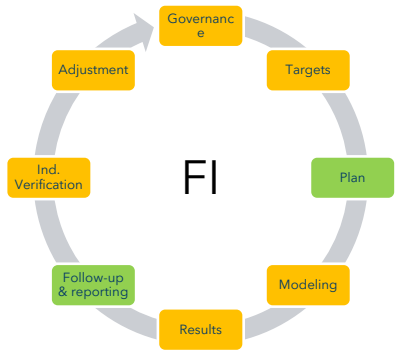







Elements of the cycle:
1. Governance
2. Targets
3. Plan
4. Modeling
5. Results
6. Follow-up & reporting
7. Independent Verification
8. Adjustment



# Score summary for the 16 benchmarked jurisdictions

## Main observations

BY JURISDICTION

- **The UK is the only country with an entirely green cycle**, in line with its first place in the overall ranking. It is followed by Ireland (7 green), Québec and Germany (6 green), and California (5 green).
- **Ontario is the only case to be predominantly in the red**, with the exception of the "results" aspect. (See box above for context on Ontario's inclusion in this comparison).

BY THEME

- **The themes most frequently in the green are planning (x13) and monitoring (x11)**, suggesting that the benchmarked governments have (almost) all at least drawn up a strategy with a reasonable level of detail, and are carrying out consistent regular monitoring (or planning to, in some recent cases) .
- **Conversely, the elements most frequently in the red are modeling, results, and adjustment** (feedback loops), with three cases each in the red (overall a small amount). This suggests that, despite plans and reporting: (a) modelling to assess whether planned measures are sufficient to achieve targets is not always carried out, (b) intended targets are not always achieved, and (c) unfortunately, this does not always result in adjustments to plans.
- **Scores for governance, targets and independent verification are somewhat scattered**, with some jurisdictions serving as models and others adopting only some of the desirable good practices.

# 4. Lessons

4.1 Cross-cutting lessons
4.2 Lessons by assessment theme

# 4. Lessons

4.1 Cross-cutting lessons

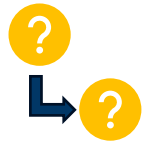
4.2 Lessons by assessment theme

# Climate change mitigation efforts face four types of risks

| Types of risk | Targets are ambitious and fair on a global scale | Promised measures meet targets | Every promised measure is delivered | Each delivered measure has the expected impact | Mitigation actions |
|---|---|---|---|---|---|
| **Ambition risk**: targets do not represent a fair and ambitious effort, relative to the global effort to mitigate climate change | ✗ | ? | ? | ? | • **Targets** aligned with science and the Paris Agreement<br>• Carbon budget<br>• Controlled negative emissions |
| **Planning risk**: measures outlined in the plan will not be collectively sufficient to achieve the stated targets | ✓ | ✗ | ? | ? | • Detailed modelled **plan** with actions that collectively achieve targets |
| **Delivery risk**: not all promised measures will be delivered (at all or on time) | ✓ | ✓ | ✗ | ? | • Transparent **reporting**, independent **verification** and mandatory **feedback**<br>• Integrated, participatory and equitable **governance** |
| **Impact risk**: measures delivered do not deliver the anticipated emission reductions<br>Subdivided into risk of missing unit targets (e.g. # of electric vehicles), and risk that expected emissions reductions per unit are not as high as thought. | ✓ | ✓ | ✓ | ✗ | • Robust **modeling** of GHG reductions by measure<br>• Consideration of rebound and perverse effects, etc.<br>• Ongoing **monitoring** and adjustment of measures |

*External and technological shocks affect delivery risk and impact risk. Political and policy changes (e.g. after elections) affect ambition, planning and delivery risk.*

# Governments' decisions about their climate frameworks determine which risks are covered and which risks are accentuated

| Case | Ambition<br>Targets are ambitious and fair on a global scale | Planning<br>Promised measures meet targets | Delivery<br>Every promised measure is delivered | Impact<br>Each delivered measure has the expected impact |
|---|---|---|---|---|
| **Québec's approach aims to limit the "delivery" risk**, promising only what it is sure to deliver and finance. On the other hand, the planning risk is higher, since today's existing measures do not yet meet the targets, and tomorrow's additional measures will only be announced gradually, year after year, until 2030. |  |  |  |  |
| **British Columbia**, on the other hand, **reduces the "planning" risk,** having developed a plan that "meets" its 2030 target. This however accentuates the delivery risk, as the government may delay or abandon some of the measures promised in the plan. |  |  |  |  |
| **The UK has ambitious targets and a plan that almost delivers on its targets**. However, the Supreme Court and the Climate Advisory Committee have identified significant delivery and impact risks: the Advisory Committee estimates that only 25% of the reductions planned for 2030 are "credible." |  |  |  |  |
| **Germany has ambitious targets** (increased in 2021 from -55% to -65% by 2030), a plan that delivers on these targets, and existing measures in 2022 that cover 97% of that target. However, there remains an inevitable impact risk, as well as some delivery risk should policies be reversed before their full implementation. |  |  |  |  |
| **France recently increased its target from -40% to -50% by 2030**. In so doing, it has reduced the "ambition risk", but increased the gap between its plan and its targets, as well as between existing measures and those that will need to be added. This dynamic illustrates the "trade-offs" between various types of risks. |  |  |  |  |

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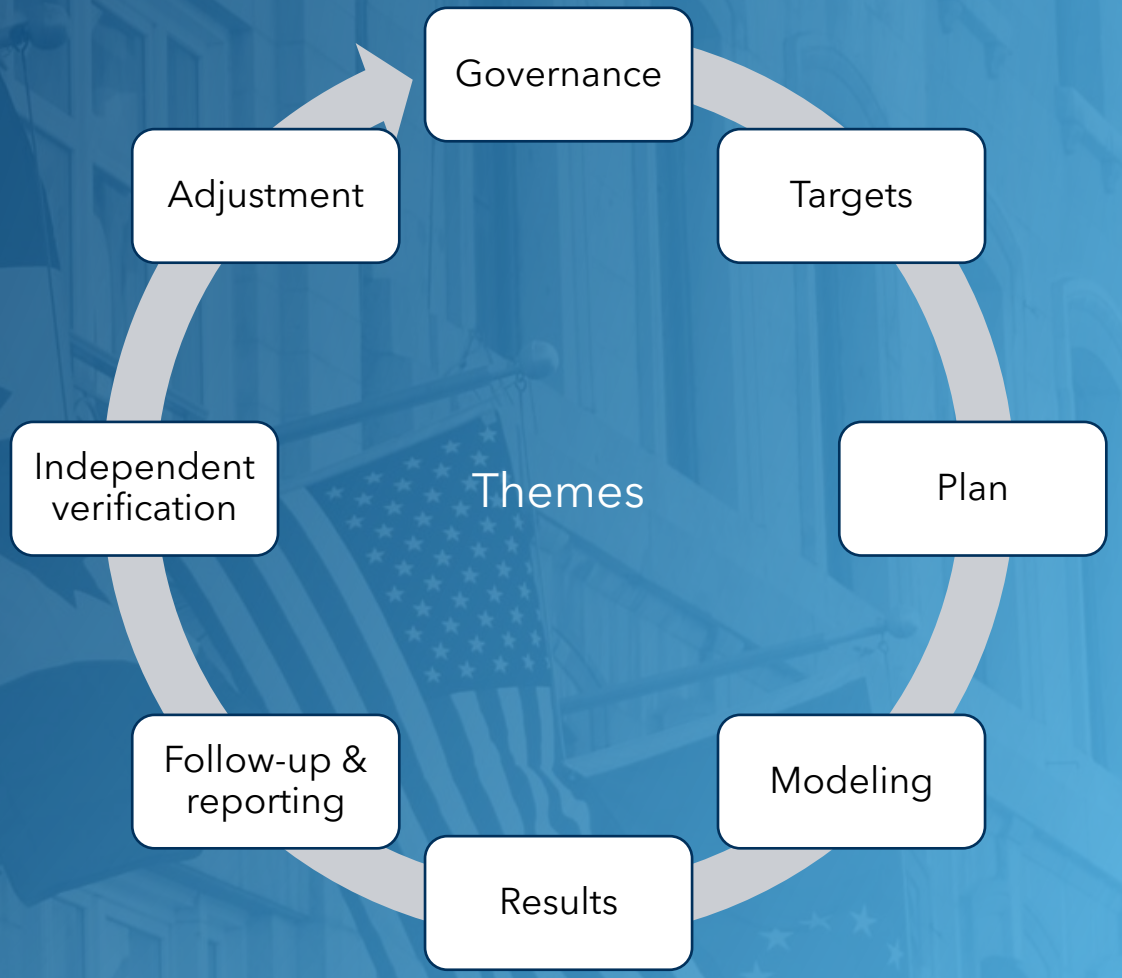
# 4. Lessons

4.1 Cross-cutting lessons

4.2 Lessons by assessment theme



# 1.1, 1.2, 1.3 Climate targets: at times ambitious, but disparities in scope and reach

## QUESTION

*Has the government set itself a carbon-neutral target (1.1.1) and intermediate targets (1.2.1)? Are these targets legally binding (1.3.1), do they have a clear and transparent setting and review process (1.2.2), and do they consider all major sectors and GHG types (1.1.2) as well as cumulative emissions within a carbon budget (1.2.3)? Finally, what is the share of negative ('net') emissions in the target (1.1.3) and what is the associated strategy for managing these emissions (1.1.4)?*

## FINDINGS

- **Almost all governments have a target of carbon neutrality by 2050** (except ON), or even in the shorter term (2045 for CAL, ME, DE, 2035 FI). Some have not yet legally ratified the 2050 target (QC, BC, NY).
- **These objectives are accompanied by more or less ambitious targets for 2030** (-40% vs. 1990 NY, -60% FI, -65% DE), 14/16 of which are enshrined in law (except NZ, ON).
- **Most targets consider all sectors and types of GHG**, but some omit emissions from land use and forestry, or "LULUCF" (QC, NB, ON, ME).
- **Only five governments have carbon budgets**, all outside North America (DE, FR, IE, UK, NZ). Québec and California have a capped carbon market that covers around 80% of their emissions.
- **The management of negative or net emissions remains unclear**. Some cases have a "net" target for 2030 (BC, DE, QC), others mainly a gross one (CAN), with plans often less defined for 2050. Five cases stand out for their more advanced thinking, or their intention to draw up a management strategy in the near future (BC, CAL, MA, FR, DE).

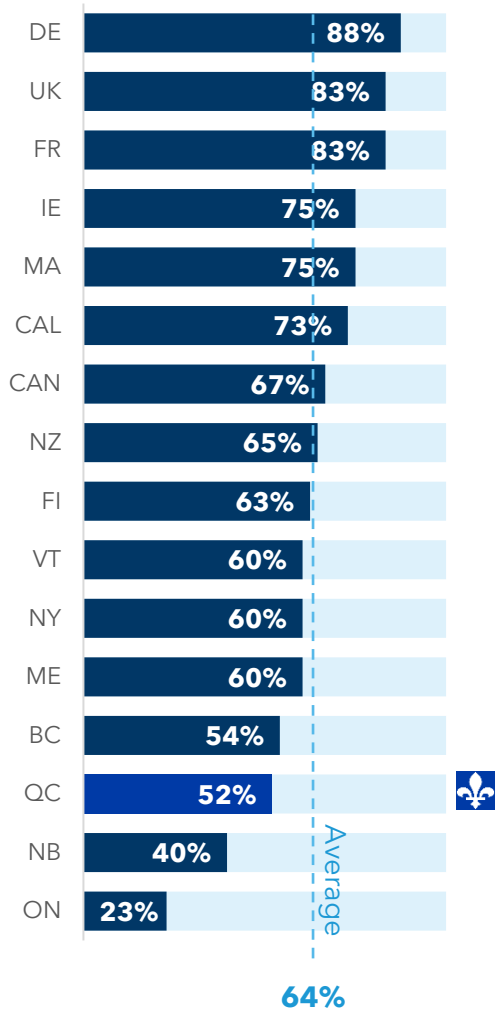
### Notes on the Québec framework

- **The QC scored 52%**, below the average (64%).
- **To improve further, Québec would benefit from** including LULUCF emissions in its target, clarifying the role of "net" or negative emissions in achieving its 2030 and 2050 targets, introducing a carbon budget mechanism, defining sectoral targets and contributions, enshrining its 2050 target in law, and clarifying when and how the next intermediate targets (post-2030) will be defined.

### Notable practices elsewhere

- **Recent target increases in Europe**, from -40% to -55% by 2030 in France in 2022, and from -55% to -65% in Germany in 2021.
- **Consideration of emissions linked to consumption or international travel**: France calculates the former, without including it in its target; the UK includes some international travel (flights, shipping) in its 6th carbon budget (2033-2037).
- **Control of negative emissions,** via a law limiting the quantity to 15% by 2050 (NY, S.6599, A.8429), a strategy similar to MA (p.17), precise targets (CAL: 20 MMT for 2030, 100 MMT for 2045, pdf p.113), or the intention to develop a strategy (BC, DE, FR).

### 1.1-1.3 Targets



# 1.1, 1.2, 1.3 Climate targets

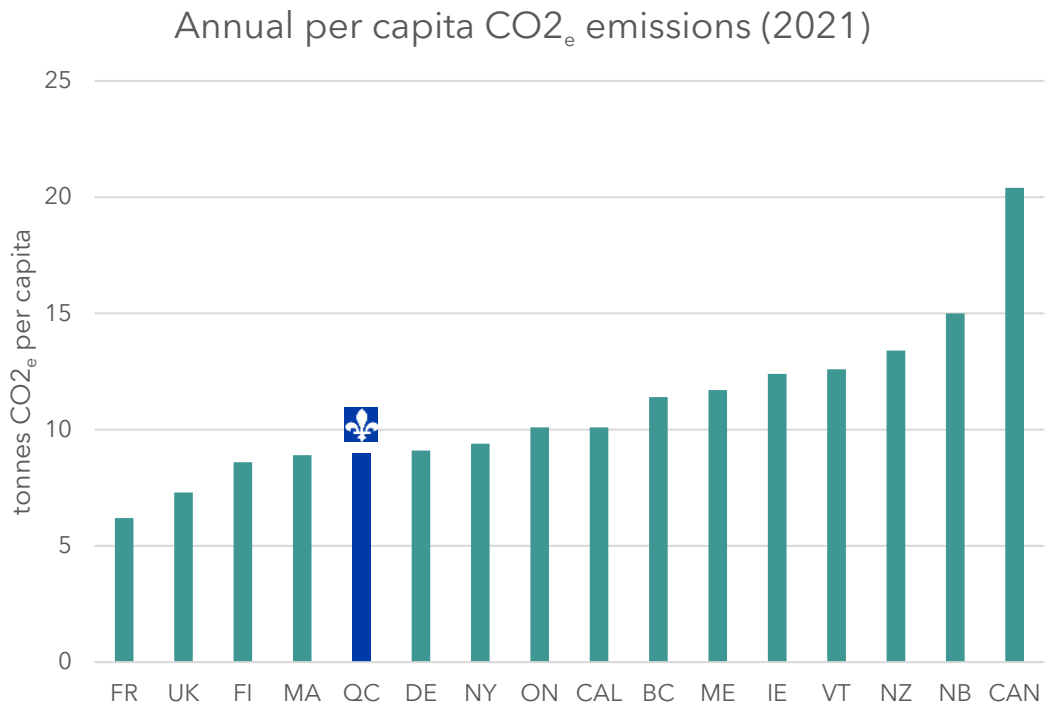
| Where | % reduction and final year (1.1.1) | % reduction, target / reference year **(1.2.1)** | Carbon budget (1.2.3) Yes (1,2), Partial (3), No (0) | Target range (1.1.2) (x/3) | Strategy for the net (1.1.4) (x/3) | Weighted total (1.1., 1.2, 1.3) (x/24) |
|---|---|---|---|---|---|---|
| **QC** | -100%, 2050 | -37.5%, 2030/1990 | Partial (1) | 2/3 | 1/3 | 12,5 |
| **CAN** | -100%, 2050 | -40% or -45, 2030/2005 | No (0) | 3/3 | 1/3 | 16 |
| **BC** | -80%, 2050/2007 | -40%, 2030/2007 | No (0) | 3/3 | 2/3 | 13 |
| **ON** | n/a | -30%, 2030/2005 | No (0) | 2/3 | 0/3 | 5,5 |
| **NB** | -100%, 2050 | -46%, 2030/2005 | No (0) | 2/3 | 0/3 | 9,5 |
| **CALI** | -100%, 2045 | -40%, 2030/1990 | Partial (1) | 3/3 | 2/3 | 17,5 |
| **ME** | -100%, 2045 | -40%, 2030/1990 | No (0) | 2/3 | 1/3 | 14,5 |
| **MA** | -100%, 2050 | -33%, 2025/1990<br>-50%, 2030/1990 | No (0) | 3/3 | 2/3 | 18 |
| **NY** | -85%, 2050/1990 | -40%, 2030/1990 | No (0) | 3/3 | 1/3 | 14,5 |
| **VT** | -100%, 2050 | -26%, 2025/2005<br>-40%, 2030/1990 | No (0) | 3/3 | 1/3 | 14,5 |
| **FROM** | -100%, 2045 | -65%, 2030/1990<br>-88%, 2040/1990 | Yes (3) | 3/3 | 1/3 | 21 |
| **FR** | -100%, 2050 | -55%, 2030/1990 | Yes (3) | 3/3 | 2/3 | 20 |
| **FI** | -95%, 2050/1990 | -60%, 2030/1990 | No (0) | 3/3 | 0/3 | 15 |
| **IE** | -100% 2050 | -51%, 2030/2018<br>-43% 2030/1990 | Yes (3) | 3/3 | 0/3 | 18 |
| **UK** | -100% 2050 | -68%, 2030/1990 | Yes (3) | 3/3 | 1/3 | 20 |
| **NZ** | -100% 2050 | -50%, 2030/2005<br>-21%, 2030/1990 | Yes (2) | 3/3 | 2/3 | 15,5 |

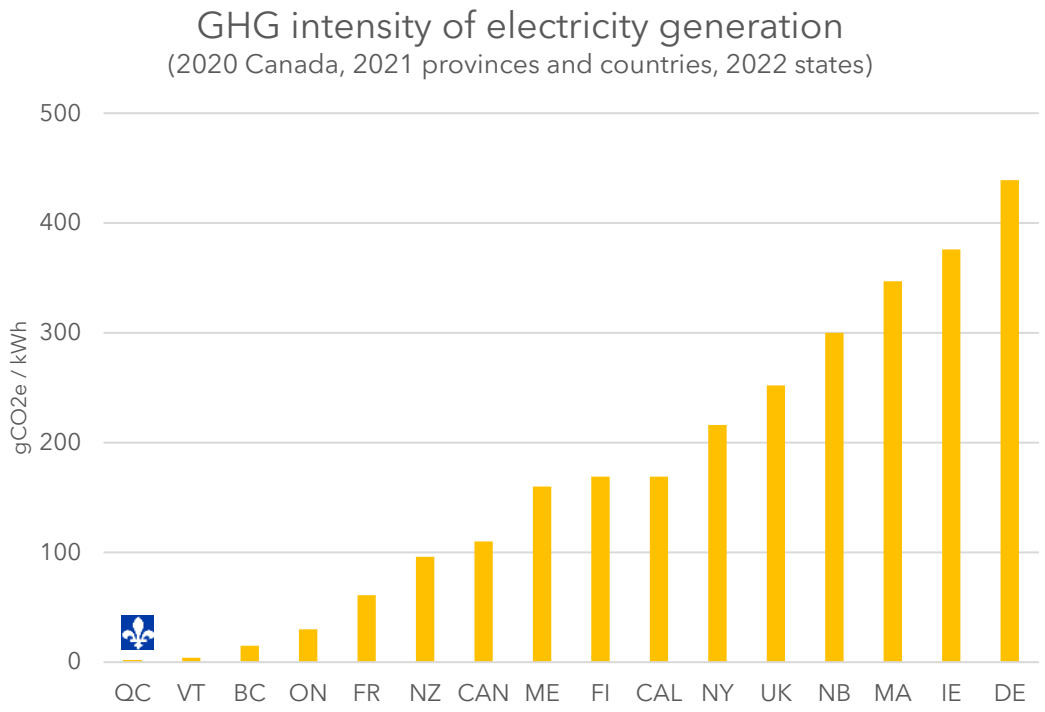
In blue - enshrined in law / In red - no

* Inclusion of all GHG types and sectors, including LULUCF (Land Use, Land-Use Change and Forestry)

# Québec's emissions are already relatively low, especially from electricity generation.

Reduction targets are difficult to compare, given the divergent emissions profiles of the different cases studied. Québec's target in particular is not the highest, being lower (-37.5% vs. 1990) than those of several other cases studied, including some whose per capita emissions are lower than Québec's (DE, FR, UK). However, the biggest source of emissions in Québec is transportation (44%),[1] even though electricity production is already very low-carbon. Emissions from transport, which are highly decentralized, may be more difficult to decarbonize than emissions from electricity generation, which have fallen sharply in several cases over the past decade (DE, UK, NZ, etc.).[2]




Sources for graphs: see appendix 6.4.

[1] Data for the year 2020, from HEC 2023, "État de l'Énergie du Québec", p.58, according to ECCC (federal inventory), 2022.

[2] See for example here: https://ourworldindata.org/grapher/carbon-intensity-electricity?tab=chart&country=FRA~EU-27~OWID_WRL~DEU~FIN~GBR~NZL~CAN~IRL. A rebound has been observed in part of Europe since 2020, and particularly in 2022, linked to the war in Ukraine and the resulting energy crisis.

## IN FOCUS — Similarities and differences between a carbon budget and a capped carbon market

A carbon budget and a carbon market are two mechanisms which have in common the fact that they set emission caps. Beyond that, however, they differ on a number of points, making them complementary but not interchangeable:

- **Objective**: a carbon budget is a *target* for which a government is accountable, in the same way as the carbon budgets of the various European governments. This accountability is accompanied by monitoring and visibility, globally and sometimes at the level of sectoral sub-budgets. A carbon market is one of the most important *means* of achieving this objective, which may or may not cover the same scope of emissions, and which may or may not achieve its targets.
- **Scope**: a carbon budget usually covers all emissions covered by the 2050 and 2030 targets. A carbon market usually excludes some emissions, although the Québec and California carbon markets cover around 80% of emissions in these two territories - a larger share than that covered by European or New England carbon markets.
- **Efficiency**: neither mechanism guarantees that caps will be respected. Non-compliance with a carbon budget can have legal or political consequences, such as the obligation in Germany for any sector that exceeded its annual emissions budget in the previous year to issue an immediate action program within three months to rectify the situation (section 8, Federal Climate Change Act). In turn, cap-and-trade carbon markets tend to drive up the price, reducing demand and encouraging decarbonization. However, various factors can hinder the effectiveness of a market and allow annual emissions to exceed caps, such as the number of free or historical allowances, as well as price caps.[1] Neither mechanism - alone or in combination - can guarantee success: to stay with the same example, Germany's transport sector continues to exceed its carbon budgets despite several immediate action programs AND the fact that it is subject to carbon pricing.

Ultimately, **then, the two mechanisms are mutually reinforcing**, one acting as a commitment (with its monitoring and adjustment obligation), and the other as a tool to achieve it (with its dynamic price directing reductions towards the cheapest sectors). For this reason, it is common to see both coexist within the same territory - in the European Union, for example, but also in the UK and New Zealand. In Québec, the advisory committee has explicitly recommended the introduction of a carbon budget in a 2021 report.

[1] See, for example, a study by Martin & Pineau (2022) which examines this phenomenon in the context of the Québec and Californian carbon markets.

# 1.4 Climate action plan: an essential reference document of varying detail and quality

dunsky

## QUESTION

*Is there a climate plan that covers the targets (1.4.1) and details the content of the planned measures (1.4.2a), their timetable (1.4.2b), the responsible actor (1.4.3), the expected GHG reductions (1.4.4.), and the planned budget (1.4.5)? Is detail provided at measure, sector or plan level?*

## FINDINGS

- **All governments have a climate plan**, but it is sometimes outdated (change of targets, DE and FR, or >5 years without update, ON), or conversely, still very recent (2022 - NY, NZ, CAN, MA, NB).
- **Most governments have several key documents, e.g.** a high-level strategy and an implementation plan (QC, FI, DE, etc.). We analyzed both, particularly the plan, for details. In some cases, a multiplication of plans (FR, DE) is detrimental to the clarity of climate action - see box below.
- **Most plans present concrete measures and timetables, but the level of detail varies**, whether in terms of actions to achieve targets (ME, NB), or targets linked to actions (DE). Moreover, more than two-thirds of plans identify the entity or entities responsible for each planned action.
- **Only 3-4 plans present the expected GHG reductions and budget at the *level of each measure*** - most plans offer details only at sector level (for reductions), or even for the whole plan (often for the budget).

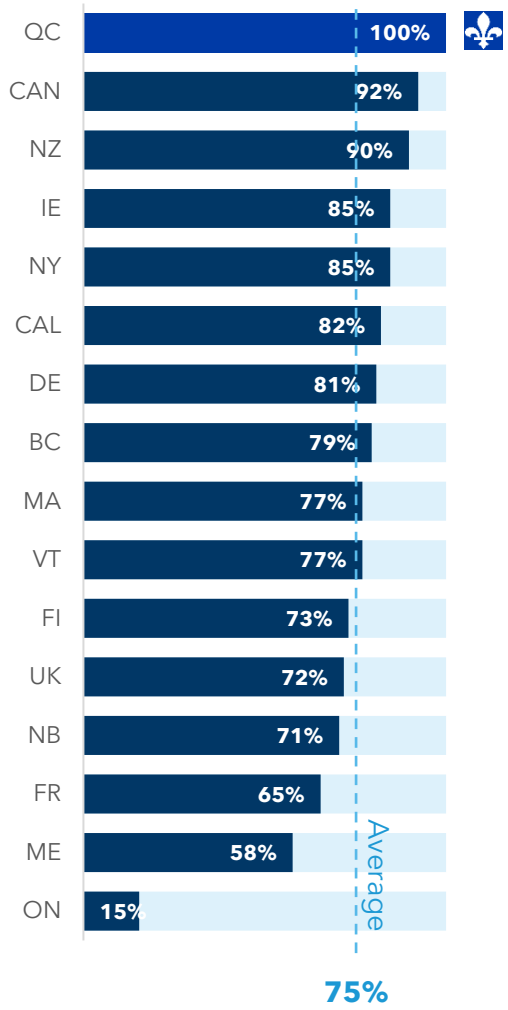
### Notes on the Québec framework

- **The Québec plan scores 100%**, above the average (75%).
- **It stands out in particular for its budgetary clarity**, being one of the few plans to present a cost per action and per year in its IP, as well as for the estimated reductions expected *per measure*.

### Notable practices elsewhere

- **Clear, structured presentation of actions** in table format, with targeted reductions, responsible actors, key indicators and/or timetable, e.g. MA (table 3-3 and appendix 1) and NZ (60-page table).
- **Quantification of the plan's cost-benefit to society**, quantitatively in present value terms ($16b cost vs. $22b savings by 2050 in VT; $290b vs. $400b in NY); also CAL, social cost and cost per ton of GHG saved per measure.
- **Detailed and comprehensive map**: Ireland.

### 1.4 Action plans



# 1.4 Climate action plan

| Where | Name of climate plan (year) (1.4.1) | Years covered | What (1.4.2) (x/2) | When (1.4.2) (yes/no) | Who (1.4.3) (x/3) | GHG (1.4.4) (x/3) | Cost (1.4.5) (x/3) | Weighted total (1.4) (x/39) |
|---|---|---|---|---|---|---|---|---|
| QC | Green Economy Implementation Plan (2023) | 2023-2028 | Yes (2) | Yes | Yes (3) | Measurement (3) | Measurement (3) | 39 |
| CAN | 2030 Emissions Reduction Plan (2022) | 2023-2030 | Yes (2) | Yes | Yes (3) | Sector (2) | Measurement (3) | 36 |
| BC | CleanBC Roadmap to 2030 (2021) | 2021-2030 | Yes (2) | Yes | Partial (1) | Measurement (3) | Plan (1) | 31 |
| ON | Made-in-Ontario Environment Plan (2018) | 2018-2030 | Few (0) | No | No (0) | Sector (2) | No (0) | 6 |
| NB | New Brunswick's Climate Change Action Plan (2022) | 2022-2027 | Partial (1) | Yes | Yes (2) | Sector (2) | Plan (2) | 27,5 |
| CAL | 2022 Scoping Plan for Achieving Carbon Neutrality (2022) | 2022-2045 | Yes (2) | Yes | Yes (2) | Sector (2) | Priorities (2) | 32 |
| ME | Maine Won't Wait (2020) | 2020-2024 | Partial (1) | Yes | Yes (3) | Plan (1) | Plan (1) | 22,5 |
| MA | Massachusetts Clean Energy and Climate Plan for 2050 (2022) | 2022-2050 | Yes (2) | Yes | Yes (3) | Sector (2) | Plan (1) | 30 |
| NY | New York's Scoping Plan (2022) | 2020-2050 | Yes (2) | Yes | Yes (3) | Sector (2) | Company (2) | 33 |
| VT | Climate Action Plan (2021) | 2021-2050 | Yes (2) | Yes | Yes (3) | Plan (1) | Company (2) | 30 |
| DE | Klimaschutzprogramm 2030 (2019) | 2020-2030 | Yes (2) | Yes | Yes (3) | Measurement (3) | Plan (2) | 31,5 |
| FR | National Low Carbon Strategy (2020) | 2020-2050 | Partial (1) | Yes | No (0) | Sector (2) | Plan (2) | 25,5 |
| FI | National climate and energy strategy (2022) and Medium-Term Climate Change Policy Plan (2022) | 2022-2035 | Partial (1) | No | No (0) | Sector (2) | Measurement (3) | 28,5 |

# In Focus

## Too much is like not enough: "doing better with less" in climate action planning

In Focus

Detailed planning of climate action is, reasonably, seen as a positive approach, and that's how we interpret it here. However, **some governments are faced with a "scattering"** and multiplication of strategic documents that overlap without always explicitly echoing each other: this is notably the case in France (national low-carbon strategy, multi-year energy programming, sectoral roadmaps) as well as in Germany (2050 strategy in 2016, 2030 plan in 2019, then immediate action plans 2022 and action plan 2023). Moreover, each of these plans involves its own coordinating and reporting bodies, which are not always well integrated.

Ultimately, despite the complexity and cross-sectoral nature of the climate challenge, it is wise to **keep the complexity of the framework in check,** and to aim for a multiplication of measures rather than a multiplication of strategies. On this subject, see the overheads below and opposite.

> *"Today in Europe, the challenge of the low-carbon transition is no longer strategic in nature, but operational."*
>
> Corinne le Quéré, President of the French Haut Conseil pour le Climat (HCC), speech in Montreal on November 6, 2023

Source: https://www.iddri.org/fr/publications-et-evenements/billet-de-blog/planification-de-la-transition-bas-carbone-en-france?utm_source=pocket_saves

**Extract from a blog post by IDDRI in France**


BILLET DE BLOG

Planification de la transition bas-carbone en France : faire mieux avec moins

**"Observation: to enable effective monitoring and evaluation of ecological transition policies, we need to focus on the quality rather than the quantity of processes and reports.** First and foremost, this means overcoming the reflex of adding more and more evaluation reports to each new law or strategic plan on low-carbon transition: while the concern for accountability and evaluation is laudable, the proliferation of reports is detrimental to the transparency of public action. Probably holding the record in this respect, the 2021 Climate and Resilience Act requires the government to produce 50 (!) new reports8 . These assessment reports and roadmaps often cover the same subjects, as evidenced by the impressive list of reports and plans concerning energy renovation, listed in a recent Iddri report (see box on page 38).

...

**Conclusion: applying sobriety to climate governance to do better with less**

Although it has become a source of complexity over time, the extraordinary diversification of the institutions, processes and tools of French governance of climate policies testifies above all to the declared desire to anchor ecological transition issues in a cross-cutting way in public policies. In this sense, it's certainly not a question of "throwing out the baby with the bathwater", in order to rebuild everything, but of taking a critical step back to improve what already exists... at a time when sobriety is back in favor, it's the principle of rationalization that should prevail in strengthening climate governance: preparing for the future, by doing better, with less.

Source: IDDR, February 2023

# 2.1 Reporting: a common practice, but not always exhaustive or used to update the plan

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## QUESTION

*Is the government required to produce a regular report on the progress of its climate plan (2.1.1)? If so, how often (2.1.2) and in what detail (2.1.3) are the actions, key indicators, lessons learned and GHGs (2.1.4)? Finally, is there a mechanism for adjusting the plan according to findings (2.1.5)?*

## FINDINGS

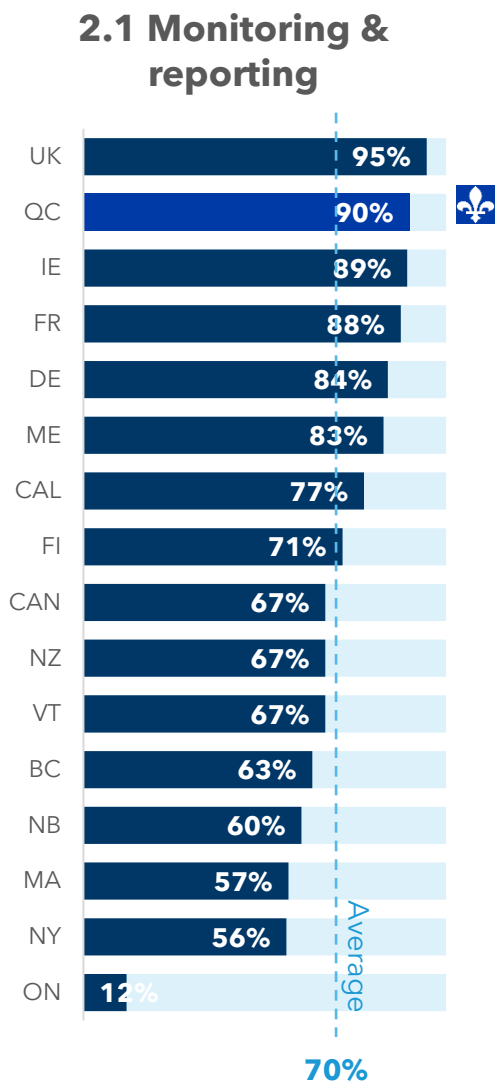
- **All governments except Ontario are required to produce a regular report**: annual in 11/16 cases, biennial in two cases (CA, NB), and every 4-5 years in 2 cases (MA, NY). Responsibility lies mainly with the government, sometimes with the advisory committee (VT), sometimes with both (BC, ME, IE).
- **In fact, 12/16 governments have produced a report since 2022**, with reports for the remaining four expected soon as their frameworks are recent (CAN, MA, NY, NZ). Some governments are behind schedule for 2023 (DE). Five have a public dashboard (QC, CAL, ME, MA, FR), sometimes dated (FR).
- **The level of detail varies: 13/16 report progress on planned measures,** and 10/16 report results achieved on key indicators. Most (13/16) also present global emissions, but only 5 present recent data (e.g. for 2022 in 2023 report), the others having a timeframe.
- **Only 4 governments have an obligation to adjust their plan after each monitoring report**, depending on progress (QC, DE, UK, IE). 9/16 have a longer adjustment cycle, not linked to regular reporting.

### Notes on the Québec framework

- **The QC scores 90%**, higher than the average (70%).
- **It stands out for its mandatory annual reporting, broken down by measure** (implementation, key indicators, GHG reductions), as well as for one of the most detailed dashboards, and the annual updating of its plan.
- **To improve further, it could publish more frequent estimates of its GHG trajectory** (the most recent data in November 2023 dates from 2020) and add a qualitative discussion of issues and lessons.

### Other notable practices

- **Close monitoring of actions in Ireland, with quarterly updates**, two annual reports required by law (1 government, 1 advisory committee), and an obligation for the sector ministers concerned to respond within 3 months and explain any adjustments.
- **Close monitoring of GHGs in Germany**, with an annual estimate of the previous year's emissions by March 15, validated by the independent committee of experts. If emissions exceed the annual sectoral carbon budget, the responsible ministry has three months to formulate an immediate action plan to correct the trajectory.



# 2.1 Accountability

| Where | Last progress report (year) | Frequency (2.1.2) (annual, bi-annual, >2, n/a) | Dashboard (2.1.2) (yes/no) | Stock info (2.1.3 - a) (yes/no) | Info on results (2.1.3 - b) (yes/no) | Info on lessons (2.1.3 - c) (yes/no) | GHG info (2.1.4) (x/3) | Impact on plan (2.1.5) (x/3) | Weighted total (2.1) (x/42) |
|---|---|---|---|---|---|---|---|---|---|
| **QC** | 2021-22 climate action review (2022) | Annual | Yes | Yes | Yes | No | 2 (delay) | 3 | 37,75 |
| **CAN** | None at present (expected December 2023) | Biennial | No | Yes | Yes | No | 2 (delay) | 2 | 28 |
| **BC** | Climate Change Accountability Report (2022) | Annual | No | Yes | Yes | No | 2 (delay) | 0 | 26,5 |
| **ON** | A Made-in-Ontario Environment Plan - Progress Since 2018 (2022) | Not specified | No | No | No | No | 1 | 0 | 5 |
| **NB** | New Brunswick's Climate Change Action Plan Progress Report 2022 (2022) | Biennial | No | Yes | Yes | No | 1 | 1 | 25,25 |
| **CAL** | State Agency Greenhouse Gas Reduction Report Card (2022) | Annual | Yes | Yes | No | No | 2 (delay) | 2 | 32,5 |
| **ME** | Maine Won't Wait Progress Update (2022) | Annual | Yes | Yes | Yes | No | 2 (delay) | 2 | 34,75 |
| **MA** | None for the most recent climate plan | Every 5 years | Yes | Yes | Yes | No | 1 | 2 | 23,75 |
| **NY** | None yet | Every 4 years | No | No | No | No | 2 | 2 | 23,5 |
| **VT** | Vermont Climate Council Report (2023) | Annual | No | Yes | No | No | 2 (delay) | 2 | 28 |
| **DE** | Klimaschutzbericht 2022 (2022) | Annual | No | Yes | No | No | 3 | 3 | 35,25 |
| **FR** | Follow-up to the National Low-Carbon Strategy (SNBC-2) (2022) + Report 2023 High Climate Council (2023) | Annual | Yes | No | Yes | Yes | 3 | 2 | 36,75 |
| **FI** | Annual Climate Report 2023 (2023) | Annual | No | Yes | No | No | 3 | 2 | 30 |
| **IE** | Climate Action Plan 2023 - Second Progress Report (2023) | Quarterly | No | Yes | Yes | Yes | 3 | 3 | 37,5 |
| **UK** | Responding to the Climate Change Committee's (CCC) 2023 Annual Progress Report to Parliament (2023) | Annual | No | Yes | Yes | Yes | 3 | 3 | 39,75 |
| **NZ** | None at present (expected in 2024) | Annual | No | Yes | Yes | No | 2 (delay) | 2 | 28 |

# 2.3 Independent advisory bodies: essential bodies with varying degrees of independence and involvement

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## QUESTION

*Is there a climate action advisory and assessment body made up of independent experts (2.3.1)? If so, does this body have its own resources? Is the government required to respond officially and publicly to the reports and recommendations of this advisory body (2.3.2)?*

## FINDINGS

- **A large majority of the governments surveyed (14/16, except ON, NB) have set up an advisory body** to provide an independent perspective on the government's climate policy.
- These bodies are sometimes consulted at the climate action plan preparation stage (ME, VT, BC, DE, FI) - and their **role more often than not consists of providing a critical expert view** of policy implementation and **making recommendations through** reports (annual or ad hoc on certain measures).
- **Their degree of independence is high for the most part (8/14)**, even if their composition or appointment process remains linked to the government for some (QC, BC, NY, ME, VT, DE) and not all have an explicit budget (CAN, BC, CA, MA, IE), a secretariat (BC, MA) or a separate website (QC, BC, ME, MA).
- **Only 5/16 governments are required to respond formally and publicly to the recommendations of advisory bodies** (CAN, FR, IE, UK, NZ), others only partially or not at all.
- **Some cases have an annual audit process dedicated to sustainable development, for** example QC and CAN.

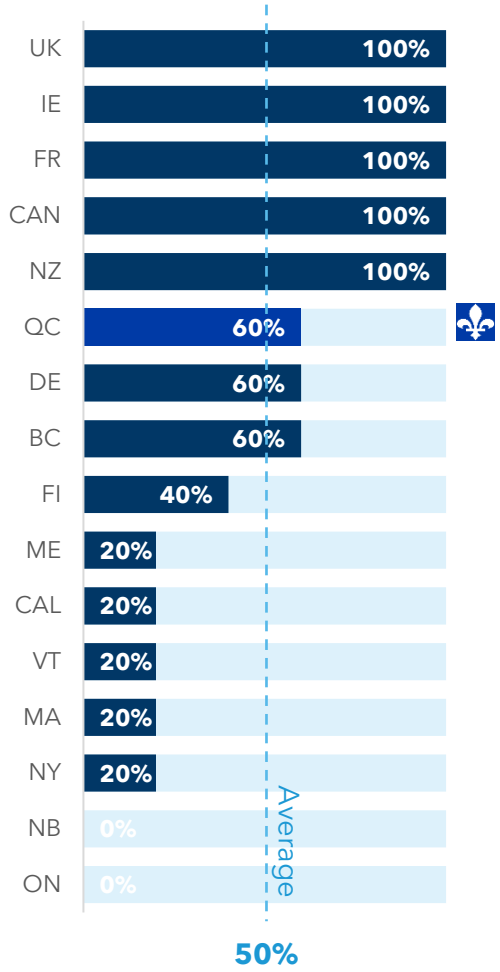
### Notes on the Québec framework

- **The Québec plan scored 60%**, close to the average of 50%.
- **To improve**, **Québec would benefit from mandating the Advisory Committee (CC) to prepare at least one annual report outlining** overall progress in the fight against climate change. At present, the CC and the Commissaire au Développement Durable (CDD) study certain themes each year (e.g. heavy transport, coastal erosion), but do not systematically comment on the overall picture and progress, or on future plans.

### Notable practices elsewhere

- **Double committee:** Germany has two independent mechanisms enshrined in law, a council of climate change experts (role of evaluating current policy) and a scientific platform for climate change mitigation. (to support the development of long-term strategies). See also pages below for a discussion of the three archetypes of advisory committee.
- **Sub-committee systems**: the BC has a climate advisory committee with an active sub-committee structure, comprising various stakeholders, for example on the theme of just transition.
- **Strategy and evaluation**: the Irish committee published its 2022-2026 strategy and an independent evaluation of its performance in 2020.

### 2.3 Independent verification



# 2.3 Independent advisory bodies

| Where | Independent Climate Committee (2.3.1) | Mandate & resources (2.3.1) (3=annual report + resources, 1-2=partial, 0=no committee) | Reply obligation (2.3.2) (2=yes, 1=partial, 0=no) | Weighted total (2.3) (max = 15) |
|---|---|---|---|---|
| **QC** | Climate Change Advisory Committee | Resources (2) | Partial (1) | 9 |
| **CAN** | The Net Zero Advisory Body | Annual report + resources (3) | Yes (2) | 15 |
| **BC** | Climate Solutions Council | Annual report (2) | Partial (1) | 9 |
| **ON** | n/a | No | No (0) | 0 |
| **NB** | n/a (creation planned in the future, see here p.12) | No | No (0) | 0 |
| **CAL** | Independent Emissions Market Advisory Committee | Limited powers (1) | No (0) | 3 |
| **ME** | n/a | Limited powers (1) | No (0) | 3 |
| **MA** | Implementation Advisory Committee | Limited powers (1) | No (0) | 3 |
| **NY** | Climate Action Council | Limited powers (1) | Partial (1) | 3 |
| **VT** | Vermont Climate Council | Limited powers (1) | Partial (1) | 3 |
| **DE** | The Council of Experts on Climate Change and Climate Change Mitigation Scientific Platform | Annual report + resources (3) | No (0) | 9 |
| **FR** | High Council for Climate | Annual report + resources (3) | Yes (2) | 15 |
| **FI** | Finnish Climate Change Panel | Resources (2) | No (0) | 6 |
| **IE** | Climate Change Advisory Council | Annual report + resources (3) | Yes (2) | 15 |
| **UK** | Climate Change Committee | Annual report + resources (3) | Yes (2) | 15 |
| **NZ** | Climate Change Commission | Annual report + resources (3) | Yes (2) | 15 |

# In Focus

## Independent advisory committees - a useful tool, different models possible

In Focus

Transparency and comprehensiveness are virtues, but they can also be costly in terms of time and resources - "*it can take a long time to clean up information for public consumption*" (interview for this mandate). A strong, independent advisory board can alleviate expectations of exhaustive transparency, and thus enable a balance of both worlds: less bureaucracy, but just as much monitoring and feedback.

Such a committee must be well-equipped to fulfill this mandate. However, there are many ways of achieving this: our analysis reveals three "archetypes" of advisory frameworks, illustrated in the table below.

| | Name | Composition | Priority | Approach | Example |
|---|---|---|---|---|---|
| | **Advisory Committee** | Stakeholders (society, economy) | Representativeness, consultation | Works collaboratively with government, operates through sub-committees | BC |
| | **Scientific Committee** | Specialists (climate, modeling, law, etc.) | Scientific expertise | Can work collaboratively and provide independent advice | DE |
| | **Supervisory Committee** | Specialists and/or stakeholders | Independence | Works autonomously and adopts an evaluation rather than coaching approach | UK |

Note that in 2019, the Finnish Advisory Committee on Climate Change published a study comparing 24 advisory committees. However, the study only includes countries (not provinces and states), and some structures have evolved since 2019.

# 2.4 Financing mechanisms: rarely protected, with variable amounts

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## QUESTION

*Does funding for climate action come from dedicated and protected sources, or from the general budget? (2.4.1). Do governments rely primarily on investments and subsidies, and/or on regulation (in other words, carrots or sticks)? (2.4.2)*

## FINDINGS

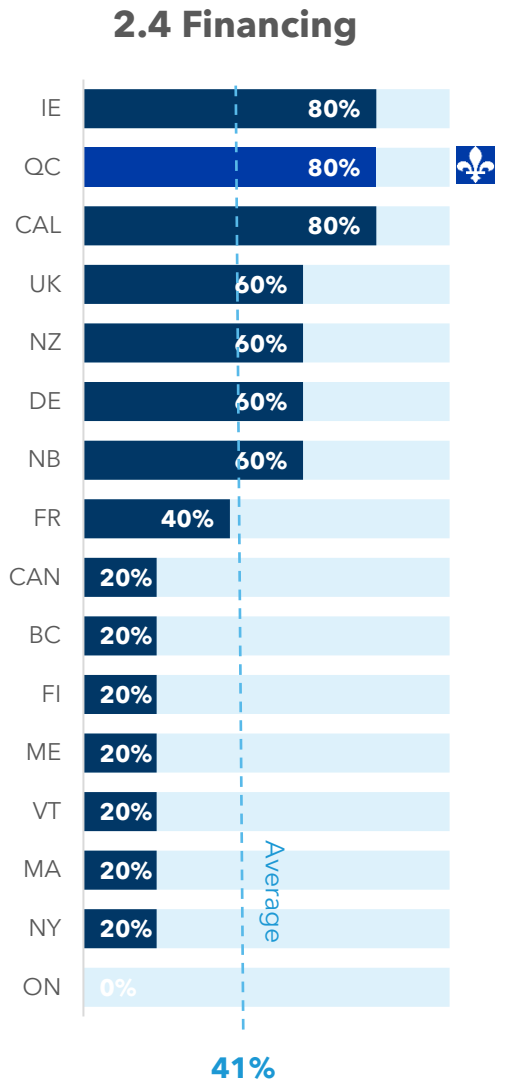
- **Funding for climate action is NOT "protected" in the majority of cases (10/16)**, where funding comes mainly or entirely from regular government budgets.
- **The governments that are exceptions (QC, CAL, IE, NB, DE, NZ) have established special funds for climate action**, often financed in part by carbon pricing revenues. These funds are subject to different processes from a regular budget, and cannot be reappropriated as easily for any other use than to combat climate change.
- **Amounts earmarked for climate action are difficult to compare**, *as they sometimes combine different envelopes, e.g. amounts for adaptation, public transport infrastructure, or the fight against inflation (e.g. transfers to households for high energy expenditure in Europe since 2022). Furthermore, some governments rely more on regulation than subsidies (FR, UK). For this reason, amounts have not been formally evaluated or compared within this benchmarking.*

### Notes on the Québec framework

- **The QC scores 80%**, well above the average (41%).
- **One of its key features is that most of the funds earmarked for climate action come from** the Climate Change and Electrification Fund (CCEF).
- **To improve further, Québec could rely even more on regulation to** complement financial incentives, particularly in the area of energy efficiency in existing buildings.

### Other notable practices

- **Detailed needs assessment and protected financing in California**: an in-depth cost assessment is included in the scoping plan (p.144 pdf). The plan assesses the investments required up to 2045, the savings achieved, the annual sectoral costs and an average annual cost per tonne between 2022 and 2045. In addition, the "*California Climate Investments*" fund, financed by the proceeds of carbon credit auctions (like the Cap-And-Trade-System For Emission Allowances, or SPEDE, in Québec), is set to finance climate actions to the tune of $2,966 million (US$) in 2022-23.



# 2.4 Financing mechanisms

| Where | Protected financing (2.4.1) (3,4 = a large part, 2 = a small part, 1 = no) | Subsidies and/or regulations (2.4.4.) (0 = plus subv., 1 = mix, 2 = plus regs.) | Weighted total (2.4) /15 |
|---|---|---|---|
| **QC** | 4 | 1 | 12 |
| **CAN** | 1 | 1 | 3 |
| **BC** | 1 | 1 | 3 |
| **ON** | 1 | 0 | 0 |
| **NB** | 3 | 1 | 9 |
| **CAL** | 4 | 1 | 12 |
| **ME** | 1 | 1 | 3 |
| **MA** | 1 | 1 | 3 |
| **NY** | 1 | 1 | 3 |
| **VT** | 1 | 1 | 3 |
| **DE** | 3 | 1 | 9 |
| **FR** | 1 | 2 | 6 |
| **FI** | 1 | 1 | 3 |
| **IE** | 4 | 1 | 12 |
| **UK** | 2 | 2 | 9 |
| **NZ** | 3 | 1 | 9 |

3. Modeling

# 3.1 Estimating the gap with targets: Québec rigorous, but with a larger gap

## QUESTION

*Do governments measure the "planning gap" between projected emissions from their actions and targets (3.1.1)? And if so, do they consider only those actions already approved and funded, or all actions under consideration (3.1.2)? Finally, do they have a plan to close the planning gap (3.1.4), as well as a strategy to avoid a "delivery gap" related to the implementation and impact of their plan measures (3.1.5)?*

## FINDINGS

- **12/16 cases present data that allow us to estimate the gap between the planned reductions of existing measures (EM) and their target**. Of these, 8/12 have a gap smaller than the QC*, see below.
- **13/16 calculate the gap between the planned measures (PM) in their plan and their target, including measures not yet ratified or financed**. QC only partially estimates this figure in the IP.
- **Only 5 governments put forward the "EM" gap in their communications**: Québec and the countries of the European Union. 7 others present data that make it possible to calculate this gap (e.g. in their submissions to the United Nations), but make little or no mention of it in their plans/reports.
- **8 governments focus mainly on the** smaller **"PM" gap.** Québec is the only case to estimate mainly the EM gap and to offer few details on the PM gap, mentioned briefly in the IP 2023-2028.
- **Most governments have no clear strategy for closing the gap** between their measures and their targets, and **only 3 formally assess the implementation risks** associated with their measures.

### Notes on the Québec framework

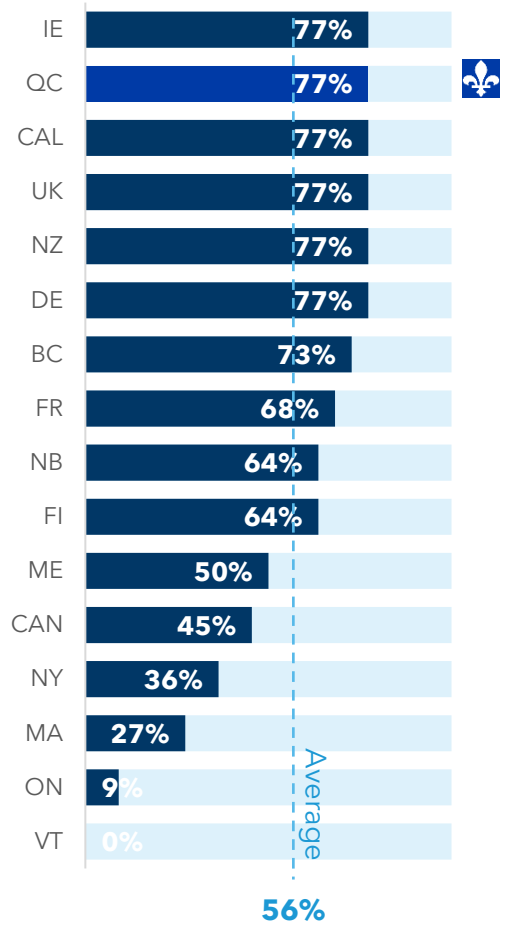
- **QC has 77%**, above the average (56%).
- **It is distinguished in particular by its strict accounting approach**, which only takes into account actions that have already been decided AND financed, and by the fact that it names certain delivery risks.
- **To improve, Québec would benefit from further clarifying how it hopes to close the 40% gap**, and assessing the risks of future delivery and impact of measures (see UK, CAL, NZ).

### Notable practices elsewhere

- **Inverse accounting from Québec to BC**: while QC only counts actions that have been ratified, BC counts all planned actions, until the government decides to delay or abandon them.
- **Double modeling every 2 years**: the European Union requires all countries to model a "EM" scenario and a "PM" scenario every two years (e.g. Ireland).
- **Quantification of delivery risks** in CAL, estimating the impact of delays in permitting or technology adoption. Also in the UK (40% of measures classified as "high delivery confidence" by government pp.16-17 & Appendix D, 38% classified as high risk by advisory committee, pp.22-23), and in NZ (ME gap estimated for two scenarios, "high impact" and "moderate").
- **Estimated cumulative gap** (in MT rather than %) in some cases with carbon budgets (e.g. DE, NZ).

* Differences in methodology and targets between governments complicate a direct comparison, but this represents our best interpretation and estimate.

### 3.1 Transparent estimation of target deviation



# 3.1 Estimating target deviation

| Where | **ME gap**, between reductions in existing measures (ME) and target (3.1.3 - in %) | **Communication gap** (3.1.2) 3 = EM, 2-1 = PM, 0 = none | **% MP deviation**, including reductions in ME and measures planned (MP) but not yet decided upon | **Strategy for closing the gap** (3.1.4) /2 | Delivery **risk assessment** (3.1.5) /2 | **Weighted total** (3.1) /33 |
|---|---|---|---|---|---|---|
| **QC** | 40% (in 2023, for 2030) | EM (3) | 27% (in 2023, for 2030) | 1 | 1 | 25,5 |
| **CAN** | 59% (in 2022, by 2030) | EM \| **PM (2)** | 14% (in 2022, by 2030) | 1 | 0 | 15 |
| **BC** | Not estimated | PM (1) | 3% (in 2022, by 2030) | 2 | 1 | 24 |
| **ON** | 77% (in 2021, for 2030) | PM (1) | 38% (in 2021, for 2030) | 0 | 0 | 3 |
| **NB** | Not estimated | PM (1) | **-13-22%** (in 2022, for 2030) | 2 | 0 | 21 |
| **CAL** | 25% (in 2022, by 2030) | PM (2) | **-20%** (in 2022, for 2030) | 2 | 2 | 25,5 |
| **ME** | 24% (in 2020 for 2030) | PM (1) | 0% (in 2020, for 2030) | 1 | 0 | 16,5 |
| **MA** | Not estimated | None (0) | Not estimated | 1 | 0 | 9 |
| **NY** | 51% (in 2022, by 2030) | PM (1) | 13% (in 2022, by 2030) | 1 | 0 | 12 |
| **VT** | Not estimated | None (0) | Not estimated | 0 | 0 | 0 |
| **DE** | 3% (in 2023, for 2030) | **EM** \| PM (3) | 0% (in 2023, for 2030) | 1 | 1 | 25,5 |
| **FR** | 33% (in 2021, for 2030) | **EM** \| PM (3) | < 27% (in 2021, by 2030) | 1 | 0 | 22,5 |
| **FI** | 23% (in 2022, by 2030) | **EM** \| PM (3) | 3% (in 2022, by 2030) | 1 | 1 | 21 |
| **IE** | 78% (in 2023, for 2030) | **EM** \| PM (3) | 43% (in 2023, for 2030) | 1 | 1 | 25,5 |
| **UK** | 19% (in 2022, for 2030) | EM \| **PM (2)** | 8% (in 2023, for 2030) | 1 | 2 | 25,5 |
| **NZ** | 11% (in 2022, by 2030) | PM (2) | <1% (in 2022, by 2030) | 2 | 2 | 25,5 |

# In Focus

In Focus

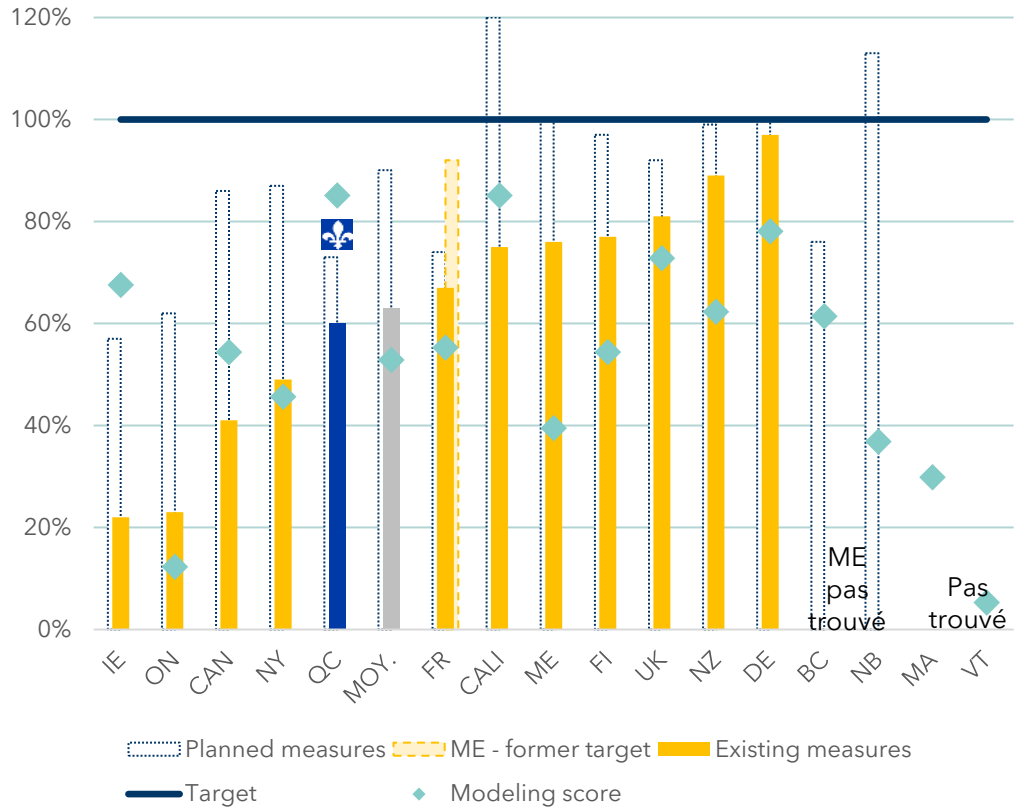
## Target deviation - what exactly are we measuring?

The gap between emissions reductions achieved by a plan's measures and its targets, as reported in each IP to the QC, is a useful figure for estimating whether a package of measures is collectively delivering the expected impacts, but **it needs to be handled and compared with caution**, for 3 reasons:

1. **The gap doesn't just measure actions**, **but also ambition**. The gap could therefore appear smaller where targets are less ambitious, or widen when a government raises its target, as was recently the case in France (gap increased from 8% to 33%). The gap also varies according to the reference year used.
2. **Calculation methodologies vary and can be confusing**: for example, if a government reduces GHGs by 30% vs. a target of 40%, it may be tempting to speak of a gap of 40-30 = 10%, whereas the gap is 1-(30/40) = 25%. The methodologies of the European Union and the United Nations Framework Convention on Climate Change (UNFCCC) help harmonize approaches, but have little direct impact on North American states and provinces, which are not required to comply directly. In this report, we have harmonized methods as far as possible to make them comparable (for example, by not counting the modeling of targets in the BC plan, such as the target to reduce car kilometers travelled, but only of measures to achieve the targets), but the exercise remains difficult. The figures opposite represent our best estimate.
3. **Communicating well around the gap is difficult**: talking too much about the EM gap can give the impression of being unprepared, talking too much about the PM gap can give the impression of being close to your target when the measurements have not yet been delivered. It can be useful to present and contrast the two, although the message is then more nuanced to communicate than a single figure.

All in all, the modeled gap remains a useful indicator to consider, but it should not be at the center of the discussion, or at least it should be contextualized and accompanied by other information and indicators.

Expected GHG reductions by 2030 for existing measures (EM) already in place and planned measures (PM) to come from the respective climate plans, relative to the reductions targeted for 2030 by each government's targets.




Sources: left, score resulting from calibration by Dunsky. Right: Dunsky's calculations, based on modeling data from the various governments. Differences in methodology, ambition and economic structure between the cases complicate a direct comparison, but this represents our best interpretation and estimate. The "modeling score" reflects the average score on dimension 3, "modeling", reflecting the rigor and transparency of the approach. See section 4.2 for details on indicators 3.1 and 3.2.

# 3.2 Emissions modelling: often done, sometimes innovative, not always transparent

dunsky

## QUESTION

*Are governments transparent about their modeling methodologies, whether for optimal trajectories (3.2.1) or for the emissions reductions associated with their plans (3.2.2)? Do they consider data quality and sensitivity (3.2.3), as well as effects such as overlap and opportunism (3.2.4)?*

## FINDINGS

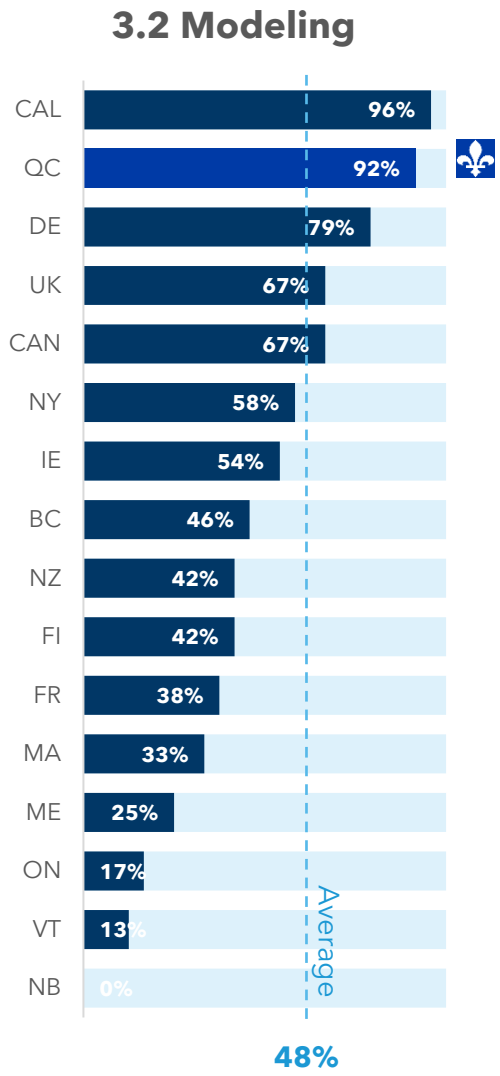
- **10/16 governments model optimized trajectories**, often following a "least cost" logic, but not always (FR). 5 do not appear to have carried out such an exercise, and 1 is not public (BC).
- **12/16 governments have modeled the emissions reductions associated with their climate plans**, with satisfactory transparency in 9 cases and more limited transparency in 3 cases. We found no such models for the remaining 4 cases (ON, NB, MA, VT).
- **Few cases (5/16) score full points for the transparency of their modeling**, either: open data, peer review, or explicit alignment with international standards. The most detailed approaches are CAL, MA, NY and FR for trajectories, and CA, QC, DE for the climate plan.
- **Just over half (9/16) provide information on data quality**, but only **a minority (5/16) clearly explain how program effects** such as overlap and opportunism **are dealt with**, so that the impact attribution method can be understood.

### Notes on the Québec framework

- **The Québec plan received a high score of 92%**, well above the average (48%).
- **It stands out for the transparency of its GHG reduction modeling methodology**, being one of the few cases to assess the quality of the data used and to present quantification guidelines. These include ISO 14 064 and 14 080, as well as opportunism.
- **It could improve if its trajectory modeling** were "open data" or peer-reviewed, and by improving its sensitivity analysis.

### Example(s) of good practice

- **Regular/multiple modelling**: the European Union requires modelling of current and planned policies every 2 years (FR, FI, DE, IE); DE has commissioned 2-3 independent modelling studies in parallel with the GHG plan and optimized trajectories.
- **Transparency of the modeling mandated by law** to the MA, with a detailed appendix to comply with it
- **Innovative optimized trajectories:** FR doesn't (just) model the lowest cost, but scenarios reflecting different visions of society; MA and NY model 8 and 5 different technological scenarios, respectively.



# 3.2 Emissions modeling

| Where | Transparent analysis of optimal trajectories (3.2.1) (3,4 = yes, 2=limited, 1=no) | Transparent modeling of plan emissions (3.2.2) (3,4 = yes, 2=limited, 1=no) | Data transparency (3.2.3) (4=high, 2,3=partial, 1=no) | Consideration of program effects (opportunism, rebound, overlap) (3.2.4) (4,3=yes, 2=limited, 1=no) | Weighted total (3.2) /24 |
|---|---|---|---|---|---|
| **QC** | Yes (3) | Yes (4) | Partial (3) | Yes (4) | 22 |
| **CAN** | Yes (3) | Yes (3) | Partial (3) | Yes (3) | 16 |
| **BC** | No (1) | Yes (3) | Partial (3) | Limited (2) | 11 |
| **ON** | No (1) | No (1) | Partial (2) | Limited (2) | 4 |
| **NB** | No (1) | No (1) | No (1) | No (1) | 0 |
| **CAL** | Yes (4) | Yes (4) | Partial (3) | Yes (4) | 23 |
| **ME** | No (1) | Limited (2) | No (1) | Limited (2) | 6 |
| **MA** | Yes (4) | No (1) | Partial (3) | Limited (2) | 8 |
| **NY** | Yes (4) | Yes (3) | Partial (3) | Limited (2) | 14 |
| **VT** | Yes (3) | No (1) | Partial (2) | No (1) | 3 |
| **DE** | Yes (3) | Yes (3) | Partial (3) | Yes (4) | 19 |
| **FI** | No (1) | Yes (3) | Partial (2) | Limited (2) | 9 |
| **FR** | Yes (4) | Limited (2) | No (1) | Limited (2) | 10 |
| **IE** | Yes (3) | Yes (3) | Partial (3) | Limited (2) | 13 |
| **UK** | Yes (3) | Yes (3) | Partial (3) | Yes (3) | 16 |
| **NZ** | No (1) | Limited (2) | Partial (2) | Limited (2) | 10 |

# 4.1-4.2 Progress in terms of implementation and emissions reductions: uneven monitoring and a few surprises

dunsky

## QUESTION

*How far have the actions planned been implemented to date, and are they progressing at a sufficient pace (4.1.1)? And what progress has been made in relation to planned emissions reductions (4.2.1)?*

## FINDINGS

- **Only half of the cases report on implementation progress (QC, BC, NB, VT, DE, FR, IE, UK),** although not all share the same level of diligence, particularly in terms of operational monitoring of actions arising from the climate plan (e.g. partial overall qualitative assessment or incomplete quantitative monitoring of targets backed by measures, or lack of critical analysis).
- **Of these, only Québec and NB show "good" progress** (50-75% of measures with sufficient progress), with the other cases showing acceptable (<50%, e.g. BC, DE, FR, IE, UK) or insufficient (<25%, VT) levels of implementation progress. **The implementation progress of other governments cannot be estimated**, either because the information is based on an obsolete framework (CAL, MA), or because reporting is planned but not yet published (CAN, NY, NZ), or because the information is not clearly presented (ON, ME, MA, FI).
- **When it comes to meeting emission reduction targets***, all but 2 governments (NY, VT) report this information, and **two are on a trajectory considered "at risk" (IE) or even insufficient (NZ)**, despite their good marks on other dimensions. The others show reductions at a pace ranging from "acceptable" (insufficient, but close) to good, with a **special mention of progress for some of the less prominent states (NB, ON).**

### Notes on the Québec framework

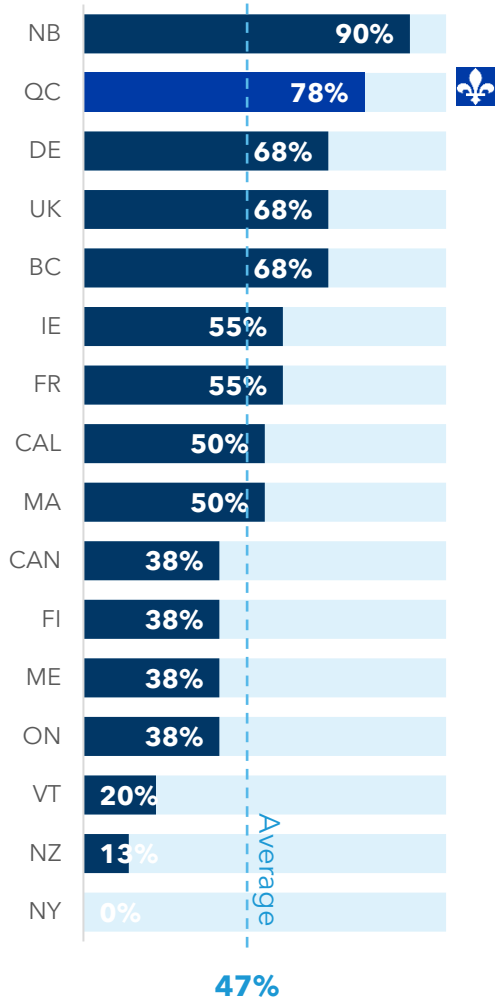
- **The Québec plan scored 78%**, higher than the average (47%).
- **It stands out for the high level of actions progressing at a satisfactory rate** (89%), and for the quality and completeness with which actions are monitored, notably via the dashboard.
- **On the other hand,** while the emissions reduction target of -20% vs. 1990 was achieved in 2020 and the trajectory was therefore deemed "acceptable", 2020 was a pandemic year and **data since then are not yet available**. Depending on data for 2021, 2022 and 2023, the assessment of the trajectory could change.

### Notable practices elsewhere

- **Emissions reductions in certain territories aligned with respective targets**, including Ontario and New Brunswick, as well as in Europe: the UK has achieved its first two carbon budgets and is on track to meet its third, and France has also met its carbon budgets to date.

* Note: these assessments, taken as snapshots, should be treated with caution, given the cyclical effects of recent crises (pandemics, inflation, war) and the effects of one-off measures (coal phase-out, for example), which may have had a significant impact on recent trends in some cases. It should also be remembered that some reduction trajectories are non-linear, with progress expected in the medium term, particularly in sectors that are difficult to decarbonize.

### 4.1-2 Results



# 4.1-4.2 Progress in terms of implementation and emission reductions

| Where | Implementation progress (4.1.1) /5 | GHG reduction progress (4.2.1) /4 | Weighted total (4) /6 |
|---|---|---|---|
| **QC** | Good (75-90%) (4) | Acceptable (3) | 4,65 |
| **CAN** | No information (0) | Acceptable (3) | 2,25 |
| **BC** | Acceptable (50-75%) (3) | Acceptable (3) | 4,05 |
| **ON** | No information (0) | Acceptable (3) | 2,25 |
| **NB** | Good (75-90%) | Good (4) | 5,4 |
| **CAL** | No information (0) | Good (4) | 3 |
| **ME** | No information (0) | Acceptable (3) | 2,25 |
| **MA** | No information (0) | Good (4) | 3 |
| **NY** | No information (0) | No information (0) | 0 |
| **VT** | At risk (25-50%) (2) | No information (0) | 1,2 |
| **DE** | Acceptable (50-75%) (3) | Acceptable (3) | 4,05 |
| **FR** | Acceptable (50-75%) (3) | Acceptable (3) | 3,3 |
| **FI** | No information (0) | Acceptable (3) | 2,25 |
| **IE** | Acceptable (50-75%) (3) | At risk (2) | 3,3 |
| **UK** | Acceptable (50-75%) (3) | Acceptable (3) | 4,05 |
| **NZ** | No information (0) | Insufficient (1) | 0,75 |

# 5.1, 5.2, 2.2 Integrated, inclusive and holistic governance: topics always mentioned, rarely sufficiently developed

## QUESTION

*How involved are stakeholders in the climate planning process (5.1.1)? Has the action plan been designed to respect the just transition principle (5.2.1)? Beyond the pure framework of mitigation/reduction of GHG emissions, is the interaction with issues of resilience and adaptation to climate change explicitly mentioned (5.2.2)? Finally, what intergovernmental coordination mechanisms are in place to ensure a coherent, integrated climate policy (2.2.1)?*

## FINDINGS

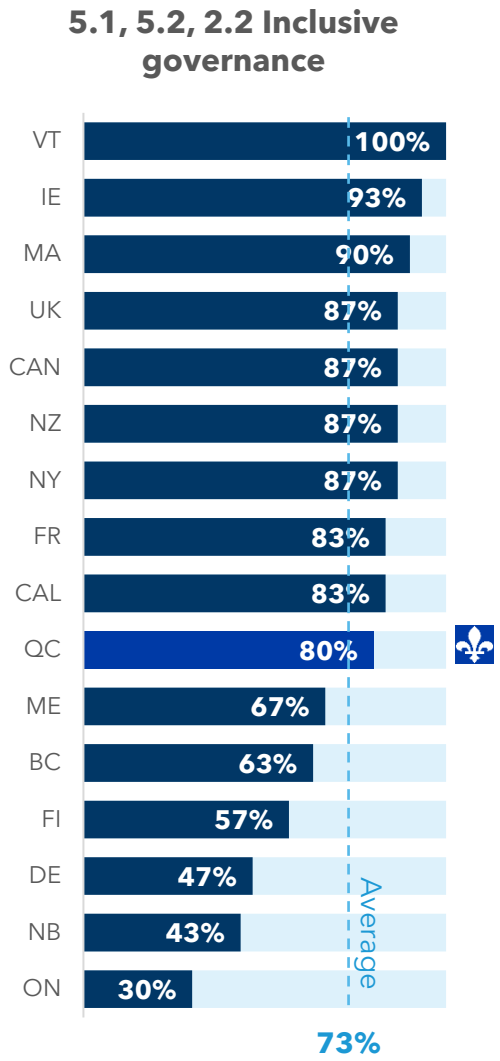
- **Almost all governments, 14/16 (except ON and NB), have established a framework for taking civil society's expectations into account**, even if this involvement is sometimes limited to the action plan development phase (QC) or if the scope of the mechanism has yet to be clarified from an operational point of view (NZ).
- **Dedicated, high-level intergovernmental coordination mechanisms exist in half the cases** (QC, CAL, MA, VT, FR, IE, UK, NZ), taking various forms. The others are less coordinated.
- **Just transition concepts are mentioned everywhere, although sometimes in a rather limited way** (ON, NB, DE, UK), or in a complementary document rather than in the action plans (QC).
- **All the climate plans mention considerations related to adaptation and resilience** to climate change, but to varying degrees: some deal with mitigation and adaptation separately, leaving aside reflections on synergies and potential frictions (BC, NB, CA, MA, FR).

### Notes on the Québec framework

- **He scored 80%**, close to the average of 73%.
- **Its distinguishing features include having enshrined the notion of just transition** in the preliminary provision of the Environment Quality Act, considering both mitigation and adaptation in the EPI, and having established a management framework as well as a coordination office (BCTE).
- To improve, it could work on more systematically integrating **mechanisms for consulting** the general public, and detailing the **methodology** for taking **just transition into account** in each relevant plan or measure.

### Notable practices elsewhere

- **Actions to maximize the involvement of civil society**, with a focus on vulnerable segments, taking the form of hearings/workshops (BC, MA, NY, CAN, IE, FR, VT, FI) and/or targeting climate policies at particular groups (NY, UK, IE).
- **Quantitative (CAL, pdf p.144) and qualitative (FI, ch. 10.1) analysis of the differentiated impacts** of the planned measures on different groups, e.g. by annual income level or gender.
- **Whole-of-government bodies overseeing climate action** under high-level authority (UK "Cabinet Committee on Climate Change", MA "Climate Chief" in the Governor's office, FR "Secrétariat général à la planification écologique" under the Prime Minister). These bodies sometimes include civil society (NY) or just transition subcommittees (VT).



# 5.1, 5.2, 2.2 Integrated, inclusive and holistic governance

| Where | Stakeholder engagement (5.1.1) (3,2=yes, 1=partial, 0=no) | Taking into account the principle of just transition (5.2.1) (3 = yes, 2=partial, 1=limited, 0=no) | Link to adaptation and resilience (5.2.2) (3=yes, 2=partial, 1=no) | Inter-governmental coordination (2.2.2) (4 = Highly integrated, 3 = Integrated, 2 = Partial, 1 = Limited) | Weighted total /15 |
|---|---|---|---|---|---|
| **QC** | Partial (1) | Partial | Yes | Highly integrated | 12 |
| **CAN** | Yes (3) | Yes | Yes | Integrated | 13 |
| **BC** | Partial (2) | Partial | Partial | Integrated | 9,5 |
| **ON** | No (0) | Limited | Partial | Partial | 4,5 |
| **NB** | No (0) | Limited | Partial | Integrated | 6,5 |
| **CAL** | Partial (2) | Yes | Partial | Highly integrated | 12,5 |
| **ME** | Yes (3) | Partial | Yes | Partial | 10 |
| **MA** | Yes (3) | Yes | Partial | Highly integrated | 13,5 |
| **NY** | Yes (3) | Yes | Yes | Integrated | 13 |
| **VT** | Yes (3) | Yes | Yes | Highly integrated | 15 |
| **DE** | Partial (2) | Limited | No | Integrated | 7 |
| **FI** | Partial (2) | Yes | Partial | Partial | 12,5 |
| **FR** | Partial (2) | Yes | Partial | Highly integrated | 8,5 |
| **IE** | Partial (2) | Yes | Yes | Highly integrated | 14 |
| **UK** | Yes (3) | Limited | Yes | Highly integrated | 13 |
| **NZ** | Partial (1) | Yes | Yes | Highly integrated | 13 |

# 5. Recommendations

5.1 Principal recommendations
5.2 Additional recommendations

# Two principal recommendations

The recommendations below go to the heart of this study and are intended to create visibility for future measures.

| Recommendations | Considerations | Mixed risk |
|---|---|---|
| **Develop and model two scenarios, EM and PM**  | • **Why?** To provide greater visibility for the 2030 plan, and to put the currently calculated EM gap into context, which will also facilitate communication.<br>• **How can this be achieved?** Requires forward-looking development of new measures, further ahead than at present, without necessarily having to get to 100% of the target. A first step could be to offer more information about the mid-term sheet mentioned in the IP Alternative: indicate an annual EM deviation schedule, e.g.: in 2024 the EM deviation will be at most 32%, in 2025 at most 25%, etc. | Planning |
| **Reduce the EM gap with the 2030 target**  | • **Why?** Because the EM gap for 2030 is greater in Québec than in many other cases studied.<br>• **How can we do this?** By announcing, starting with the next IP, measures that will continue to reduce the gap, as was the case when previous IPs came out. Also, by clarifying the proportion of the 2030 target that will be achieved in Québec and outside Québec, and accounting for the reductions planned accordingly. | Planning |

# Two secondary recommendations

The recommendations below are opportunities for improvements that emerge from the analysis, without being directly linked to the gap between planned measures and the target.

| Recommendations | Considerations | Mixed risk |
|---|---|---|
| **Putting the just transition principle into practice**  | • **Why just transition?** Just transition is not just a virtue, but a strategy for political sustainability and social acceptance, enabling climate action to be delivered and reach their targets. Québec has clearly positioned this principle within these efforts (see the MELCCFP fact sheet on the subject), but it is not yet operationalized or very present within Implementation Plans (IPs), and more generally, within sustainable development efforts in Québec, as noted by the Commissaire au Développement Durable (2023, p.7).<br>• **How can we do this?** Integrate this principle into each IP, notably in the planning of measures, the differentiated analysis of impacts, the assessment of implementation risks, and in monitoring and reporting. To this end, develop one or more methodological notes or guidelines, such as for quantifying emissions. | Delivery |
| **Mandate the Advisory Committee to take an annual position on overall progress**  | • **Why should we do this?** An independent position paper or annual report on climate efforts contributes to regular monitoring that complements the government's balance sheet. At present, both the annual audit by the Commissioner for Sustainable Development and the work of the various advisory committees only occasionally provide an overview, often focusing on specific sub-themes. Conversely, many states require at least one comprehensive annual report from their committee, while at the same time allowing their committees the freedom to study other subjects. Many also ask their committees to comment on documents under preparation (plans, models).<br>• **How can we do this?** By adding this expectation to the Advisory Committee's mandate (while consulting with it throughout the process), and equipping it as needed to meet this expectation (e.g., additional resources or budget, if required). The expectation could be for an annual report or two annual position papers (one on the IP, one on the balance sheet). Other good practices observed in other states could also be considered and, if relevant, implemented over time (annual work plan, occasional independent evaluation, Just Transition subcommittee, government response obligation). | Delivery |

# Additional recommendations

The recommendations below are important, but not all of them are urgent.
In some cases, they could be dealt with post-2025, and apply to the post-2030 framework.

| Recommendations | Considerations | Mixed risk |
|---|---|---|
| Confirming the 2050 target | To create clarity and predictability | Ambition |
| Setting sector targets | Established on the basis of optimal trajectory analyses and endorsed at cabinet level. These targets need not be formal (in law) or even public, but must signal clear expectations internally. | Ambition |
| Adopting carbon budgets | In order to keep track of cumulative emissions, which are ultimately what matters in the fight against global warming. A carbon budget is an *objective* to which accountability is attached, whereas the SPEDE caps are a *tool* for achieving them. | Ambition |
| Consider UCTAFs and estimate consumption and travel emissions | For LULUCF: in order to consider this important aspect of the economy (which can both contribute to and absorb emissions), and align with the practices of several other governments. For other aspects: in order to have a complete picture of the situation, without necessarily aiming to integrate them into formal targets, given international standards. Consider in particular the first estimate (2023) of consumer emissions from the Institut de la Statistique du Québec. | Ambition |
| Developing a strategy for the net | In order to offer greater visibility on the use of carbon capture and absorption technologies and possible targets or caps, particularly for the post-2030 period. | Ambition |
| Issue an overall assessment of progress with each report | To put the various figures into context (% of actions on track, deviation from targets, GHG trajectory, budget expenditure), as well as any changes in context and lessons learned. Can accompany the official report, or be delegated to the advisory committee, or both. | Delivery |
| More frequent GHG data (annual estimate) | In order to have a quicker and more up-to-date picture of Québec's emissions trajectory (German model: estimate for the previous year on March 15 of the previous year). | Impact |

# 6. Appendices

6.1 Further information on case selection
6.2 Full list of assessment criteria
6.3 Sensitivity analysis
6.4 Data sources by jurisdiction

# 6. Appendices

6.1 Further information on case selection

6.2 Full list of assessment criteria

6.3 Sensitivity analysis

6.4 Data sources by jurisdiction

Elimination sorting details

# Elements considered for high-level sorting

**88 states**
50 United States, 13 Canada (+ Québec), 15 Europe, 9 Oceania

So rt 1

**40 states**
16 United States, 6 Canada (+ Québec), 13 Europe, 4 Oceania

So rt 2

So rtin g 3

**16 states**
4 United States, 5 Canada (+ Québec), 4 Europe, 1 Oceania

Elimination criteria

Scoring grid

Decision

| Key elements | Detailed indicators |
|---|---|
| **Targets** | • Existence of an interim GHG reduction target (by 2030 or 2035)<br>• Ambition level of interim target: at least -35% relative to 2005 |
| **Climatic conditions** | • Existence of a climate plan (yes)<br>• Regular accountability (yes) |
| **Ambition level** | • Ultimate target = net zero or close (1 point)<br>• Target year for carbon neutrality is before 2050 (1 point)<br>• Ultimate target enshrined in law (1 point)<br>• Interim target is aligned with trajectory 1.5 degrees (1 point) |
| **Level of rigor** | • Action plan with targets and costs per action (1 point)<br>• Action plan presents an accountability framework (1 point)<br>• Annual reporting obligation (1 point)<br>• A progress report is available (1 point)<br>• Most recent report dated 2021 or later (1 point) |
| **Comparability level** | • Carbon intensity of electricity generation < 100 gCO2e/kWh (1 point)<br>• Sector responsible for most GHG = transport (1 point)<br>• Population density <35 inhabitants / km2 (1 point)<br>• GDP/capita <$55,000 USD (1 point) |
| **Quantitative and qualitative judgment** | • Comparison of average scores (ambition, rigor, comparability)<br>• Second reading, internal discussion, validation and selection |

Elimination sorting details

# Overview of the 15 cases selected for detailed comparison with Québec

| | Case | Average | Ambition | Rigor | Comparability | Comment |
|---|---|---|---|---|---|---|
| Canada | British Col. | **75%** | 25% | 100% | 100% | Canadian leader, all-round framework |
| | Federal | **78%** | 75% | 60% | 100% | Recent and complete framework |
| | Ontario | **-** | - | - | - | Not valued, includes for comparison purposes |
| | New Brunswick | **64%** | 50% | 80% | 63% | Québec neighbor with recent framework |
| United States | Maine | **78%** | 100% | 60% | 75% | Ambitious Québec neighbor, detailed framework |
| | California | **68%** | 100% | 80% | 25% | American leader, ambitious |
| | Massachusetts | **60%** | 75% | 80% | 25% | A fairly ambitious and detailed plan |
| | Vermont | **48%** | 50% | 20% | 75% | Québec neighbor with detailed plan (but no costs) |
| | New York | **45%** | 50% | 60% | 25% | Innovative neighbor, but very recent framework |
| Other | Finland | **88%** | 100% | 100% | 63% | Scandinavian leader |
| | New Zealand | **81%** | 75% | 80% | 88% | Oceania leader |
| | France | **77%** | 75% | 80% | 75% | European leader |
| | Germany | **75%** | 100% | 100% | 25% | European leader |
| | United Kingdom | **75%** | 75% | 100% | 50% | European leader in carbon budgets since 2008 |
| | Ireland | **63%** | 75% | 100% | 13% | Very complete and transparent plan |

The percentages represent the points awarded to each case divided by the maximum possible, according to the scoring grid shown on the previous page. This evaluation was carried out at a high level early in the mandate, in order to select cases for detailed comparison. These cases were then analyzed in depth. A plan judged to be "detailed" at this stage could therefore prove to have shortcomings later on.

Elimination sorting details

# Case selection in the United States

| UNITED STATES | Case | All >50%? | What <50%? |
|---|---|---|---|
| 78% | Maine | Yes | / |
| 68% | California | no | Comparable |
| 64% | ~~Michigan~~ | no | Comparable |
| 64% | ~~Louisiana~~ | no | Comparable |
| 62% | ~~Maryland~~ | no | Comparable |
| 60% | Massachusetts | no | Comparable |
| 58% | Minnesota | no | Comparable |
| 55% | ~~Oregon~~ | no | Rigorous |
| 55% | Nevada | no | Rigorous |
| 53% | ~~Colorado~~ | no | Comparable |
| 51% | ~~Hawaii~~ | no | Comparable |
| 48% | Vermont | no | Rigorous |
| 48% | North Carolina | no | Rigorous |
| 47% | Washington (State) | no | Rigorous |
| 45% | New York (State) | no | Comparable |
| 45% | Connecticut | no | Comparable |

## Selected from the top 5:

- **Maine** - best score, and comparable
- **California** - leader in the United States

## Out of the top 5:

- **Maryland** – ambitious plan but lacking in detail
- **Michigan** – ambitious plan but lacking in detail
- **Louisiana** – ambitious plan but lacking in detail

## Fished out:

- **Massachusetts** - #6, quite active and detailed
- **New York** - ambitious (but very recent) plan
- **Vermont** - neighbor, detailed plan (but no costs)

Elimination sorting details

# Case selection in Canada

| CANADA | Case | All >50%? | What <50%? |
|---|---|---|---|
| 78% | Canada (federal) | Yes | / |
| 75% | British Columbia | no | Ambitious |
| 77% | ~~Prince Edward Island~~ | Yes | / |
| 73% | ~~Nova Scotia~~ | Yes | / |
| 64% | New Brunswick | Yes | / |
| 53% | ~~Yukon~~ | no | Ambitious |

## Selected from the top 5:

- **Federal government** - recent framework
- **British Columbia** - leader, detailed framework
- **New Brunswick** - comparable neighbor

## Omitted:

- **Prince Edward Island** - leader, ambitious, but omitted as too small and less comparable
- **Nova Scotia** – avoid overrepresentation from maritimes, GHG emissions profile less comparable to Québec than New Brunswick
- **Yukon** - smaller, not comparable

## Added:

- **Ontario** - relevant for QC because two provinces often compared to each other

Elimination sorting details

# Selection of other Western cases

| OTHER | Case | All >50%? | What <50%? |
|---|---|---|---|
| 100% | ~~Sweden~~ | Yes | / |
| 88% | Finland | Yes | / |
| 81% | New Zealand | Yes | / |
| 78% | ~~Iceland~~ | Yes | / |
| 77% | France | Yes | / |
| 75% | Germany | no | Comparable |
| 75% | United Kingdom | Yes | / |
| 72% | Victoria (Aus) | no | Rigorous |
| 70% | Portugal | Yes | / |
| 67% | Denmark | no | Comparable |
| 64% | Norway | Yes | / |
| 63% | Ireland | no | Comparable |
| 55% | Switzerland | no | Rigorous |
| 52% | Netherlands | no | Comparable |
| 48% | Italy | no | Ambitious |
| 41% | New South Wales (Aus) | no | Ambitious |
| 38% | Queensland (Aus) | no | Ambitious |

## Selected from the top 5:

- **Finland** - detailed, high-quality framework
- **New Zealand** - Oceania leader
- **France** - detailed legal framework

## Omitted from top 5:

- **Sweden** - loss of current momentum, plan seems less detailed than Finland's
- **Iceland** - avoid too many Nordic countries, plan seems less detailed than Finland

## Included:

- **Germany** - detailed framework for numerous years
- **United Kingdom** - detailed framework for numerous years
- **Ireland** - very detailed and complete framework

# 6. Appendices

6.1 Further information on case selection

6.2 Full list of assessment criteria

6.3 Sensitivity analysis

6.4 Data sources by jurisdiction

# Dimension 1: Foundations

| # | Indicator | Rating scale (from best grade to worst grade, worst grade = 0, best grade = number of options -1) | Weighting in its dimension | % of total |
|---|---|---|---|---|
| **1.1.** | **Target net zero** | | | **4%** |
| 1.1.1 | Existence of net zero target | 3- Net Zero targeted before 2050<br>2- Net Zero targeted for 2050<br>1- Close to Net Zero by 2050 (at least -90%, compared with a clear reference year)<br>0- Less than -90% target by 2050, or no target announced | x1 | 1% |
| 1.1.2 | Scope of the objective | 3- All major GHGs and sectors, including. LULUCF (Land Use, Land-Use Change and Forestry)<br>2- All major GHGs and sectors (transport, buildings, industry, waste, agriculture), except LULUCF<br>1- Missing minor GHGs or sectors (with justification)<br>0- Major GHGs (e.g. CH4) or major sectors missing | x1 | 1% |
| 1.1.3 | % negative emissions forecast | 3- No negative emissions (NE) expected/required<br>2- NE plans do not exceed 20% of final targeted reductions<br>1- NE plans do not exceed 30%.<br>0- More than 30% NE share or amount not limited or specified | x1 | 1% |
| 1.1.4 | Credibility of negative emissions management strategy | 3- No NE expected/required - BUT - must be credible<br>2- NE plans present details on "how" + if carbon offsets, they are only made within own territory + if new technology/testing, risks are highlighted<br>1- Some explanations are offered on EN plans, with certain limitations<br>0- No explanation/very little explanation of NE plans | x1 | 1% |
| **1.2** | **Intermediate target** | | | **3%** |
| 1.2.1 | Existence of intermediate objectives | 3- Intermediate target by 2030 + 50+% reduction (any reference year between 1990 and 2010)<br>2- Intermediate target by 2030 + 30+% reduction (any base year 1990-2010)<br>1- Intermediate target no later than 2035, at least 30% reduction targeted<br>0- No intermediate target by 2035 or less than 30% reduction target | x1 | 1% |
| 1.2.2 | Goal-setting and review process | 2- Codified rules for setting and updating targets (in law or other documents) + targets set 10 to 15 years in advance<br>1- Only 1 of the 2 conditions<br>0- Absence of all conditions (or absence of intermediate targets), or no information found | x1 | 1% |
| 1.2.3 | Use of cumulative, legally binding carbon budgets | 3- Use of a cumulative binding carbon budget framework + sectoral sub-budgets (indicative or binding)<br>2- Use of a cumulative binding carbon budget framework, without details of sectoral sub-budgets<br>1- Non-binding carbon budgets (with or without sectoral sub-budgets), or capped carbon market covering >50% of emissions<br>0- No cumulative emissions budget framework | x1 | 1% |

* rounded

# Dimension 1: Foundations

| # | Indicator | Rating scale (from best grade to worst grade, worst grade = 0, best grade = number of options -1) | Weighting in its dimension | % of total * |
|---|---|---|---|---|
| **1.3** | **Binding targets** | | | **1%** |
| 1.3.1 | Legal status of targets | 3- Final AND intermediate targets in the law, AND these targets are aligned with climate plan targets/net zero public commitments<br>2- Final OR intermediate targets in law (AND aligned as above)<br>1- Some targets in law, but not fully aligned with climate plan targets/net zero public commitments<br>0- Targets not included in law | x1 | 1% |
| **1.4** | **Climate Action Plan** | | | **12.6%** |
| 1.4.1 | Existence of an exhaustive climate action plan | 2- Plan exists, with measures for all scopes, GHG types and emission sectors covered by the target.<br>1- Plan exists, with measures for most but not all scopes/GES/sectors<br>0- Measures for only some of the scopes/sectors; or no climate plan at all | x3 | 2.9% |
| 1.4.2 | Level of detail of the climate plan | 2- For each planned action, information is provided on the nature of the action (grant, settlement, other), the target, and the timetable.<br>1- Somewhat limited information (e.g. vague objectives, vague timetable)<br>0- No or very limited information (e.g. just a title, or a vague intention) | x3 | 2.9% |
| 1.4.3 | Responsibility for the climate plan | 3- Yes, responsible actor explicitly named for each measure/action<br>2- Mostly named (for current actions, but not for all future actions)<br>1- Named only sometimes (missing for some current actions)<br>0- No (generally unspecified) | x1 | 1% |
| 1.4.4 | Climate plan emissions | 2- Information on expected emissions reductions is provided for each measure (or almost every measure) in the plan.<br>1- Information on expected emissions reductions is only provided globally for the entire plan.<br>0- No information on expected emissions reductions is provided | x3 | 2.9% |
| 1.4.5 | Climate plan budgeting | 3- Specific budget for all/most actions<br>2- No specific budget for most actions, but good overview of total plan costs<br>1- Some cost information for some measures, or overall estimate with some limitations<br>0- Cost information not specified (neither by measure nor by overall estimate) | x3 | 2.9% |

* rounded

# Dimension 2: Governance & accountability

| # | Indicator | Rating scale (from best grade to worst grade, worst grade = 0, best grade = number of options -1) | Weighting in its dimension | % of total * |
|---|---|---|---|---|
| **2.1** | **Accountability mechanisms** | | | **16.3%** |
| 2.1.1 | Progress reporting obligation | 3- Yes - Existence of a clear framework, legally enshrined, requiring regular reporting<br>2- Mostly yes - Existence of a clear framework requiring regular reporting - even if not enshrined in law<br>1- Somewhat - Generic commitment to report on progress, but no strict obligation or framework to follow<br>0- No - No clear commitment | x3 | 3.5% |
| 2.1.2 | Frequency of progress reports | 4- Annually or less (report), + dashboard<br>3- Annually or less (report), no dashboard<br>2- Every two years<br>1- Every 5 years or more<br>0- Never (unclear/unspecified) | x3 | 3.5% |
| 2.1.3 | Quality and comprehensiveness of progress reports | 4- Detailed progress report, with (a) implementation progress for each action + (b) results assessment + (c) qualitative discussion<br>3- Detailed report on (a), missing (b) OR (c)<br>2- Detailed report on (a), missing both (b) and (c)<br>1- Limited/vague report on (a), regardless of (b)/(c)<br>0- No progress report or very inadequate report | x3 | 3.5% |
| 2.1.4 | Periodic assessment of GHG reduction trajectory | 3- Global GHG reductions are (a) assessed each year**, (b) for the previous year, and (c) compared with the target trajectory.<br>2- (a), but not (b) or (c)<br>1- Irregular assessments (no fixed schedule), or assessments with little detail/credibility<br>0- No evidence that this has been done or is planned | x2 | 2.3% |
| 2.1.5 | Existence of a reporting feedback loop | 3- Mandatory revision of the climate plan after each progress report, taking into account the report's conclusions<br>2- Mandatory revision of the plan according to another, pre-determined timetable (e.g. every 5 years), taking into account progress to date<br>1- Obligatory regular updating of the plan, but with little or no consideration of progress to date<br>0- No clear framework for updating and revising the plan during implementation | x3 | 3.5% |

** Or with each progress report if these are not annual, so as not to penalize twice those cases which produce reports less frequently, see 2.1.2.

* rounded

# Dimension 2: Governance & accountability

| # | Indicator | Rating scale<br>(from best grade to worst grade, worst grade = 0, best grade = number of options -1) | Weighting in its dimension | % of total * |
|---|---|---|---|---|
| **2.2** | **Whole-of-government approach** | | | **2.3%** |
| 2.2.1 | Intergovernmental coordination mechanisms | 3- Clear commitment to a whole-of-government approach, with (a) a designated coordinating/oversight entity (not just one ministry/unit among many), (b) involvement of several/most ministries in the effort, AND(c) direct involvement/linkage with high-level leaders (e.g., cabinet, prime minister)<br>2- Same as above (designated entity), but no high-level executive involvement, or no clear definition of the coordinating entity's resources<br>1- Some collaborative mechanisms exist, but resources or authority are limited; climate action is seen as a "sectoral issue" (several ministries may be involved/responsible for actions, but there is no clear government-wide steering)<br>0- Little or no effort towards a whole-of-government approach | x2 | 2.3% |
| **2.3** | **Independent institutions** | | | **5.8%** |
| 2.3.1 | Advice and evaluation by independent experts | 3- A specialized advisory body responsible for gathering external advice and feedback from independent experts (academic institutions, industry specialists, scientists) a) exists, b) is independent, c) has specific resources (budget, secretariat, etc.), and d) is responsible for producing at least one annual global review of efforts to combat climate change.<br>2- a-b, but not c OR d<br>1- a, but with limitations (e.g., limited scope, limited independence, limited resources, limited quality of reports)<br>0- None (no independent advisory mechanism in place) | x3 | 3.5% |
| 2.3.2 | Formalized response requirement | 2- Government obligation to provide a formal public response to the advisory body's reports/recommendations.<br>1- Response requirement/process, but not formalized or limited in scope/detail<br>0- No response requirement/process | x2 | 2.3% |
| **2.4** | **Financing mechanisms** | | | **5.8%** |
| 2.4.1 | Dedicated and guaranteed financing mechanisms | 3- Almost all (>75%) climate action funding comes from dedicated mechanisms, protected from other uses<br>2- Most (50-75%) funding comes from such mechanisms<br>1- Less than half (25%-50%)<br>0 - Few (25%), or, unspecified | x3 | 3.5% |
| 2.4.2 | Total budget for climate action plan | N/A (information collected but not evaluated, as it is difficult to compare accurately) | N/A | N/A |
| 2.4.3 | Amounts of financing from selected sources | N/A (information collected but not evaluated, as it is difficult to compare accurately) | N/A | N/A |
| 2.4.4 | Relative use of programs and regulatory measures | 2- Intensive use of regulatory/mandatory approaches ("sticks"). At a minimum, we need: a zero-emission light vehicle standard, a performance disclosure rating system for energy consumption in residential buildings, and a decarbonization target for electricity.<br>1- Mix of "carrots" and "sticks<br>0- Predominantly carrots, with few or no sticks | x2 | 2.3% |

* rounded

# Dimension 3: Modeling

| # | Indicator | Rating scale (from best grade to worst grade, worst grade = 0, best grade = number of options -1) | Weighting in its dimension | % of total * |
|---|---|---|---|---|
| **3.1** | **Emissions gap** | | | **17.3%** |
| 3.1.1 | Disclosure of the estimated gap between anticipated plan reductions and targets | 2- The gap is estimated and disclosed, and reasonably clear<br>1- The gap is estimated and disclosed, with some ambiguity/limited details<br>0- No gap is estimated or disclosed | x3 | 4.7% |
| 3.1.2 | Strict consideration only of measures already decided and financed | 3- Strict accounting: the estimate of the gap includes only those measures that have been announced, decided upon and for which financing is assured; or the impact of the measures is weighted by the probability of their delivery.<br>2- Semi-flexible accounting: the estimate of the gap includes planned future measures, including those whose announcement or financing decision is pending.<br>1- Flexible accounting: the gap estimate includes all measures, including uncertain future technologies and negative emissions<br>0- No metering: no gap is disclosed (or assumptions that prevent a gap, e.g. backcasting or negative emissions). | x3 | 4.7% |
| 3.1.3 | Gap size (% covered by plan vs. target) | N/A (information identified but not evaluated) | N/A | N/A |
| 3.1.4 | Existence of a strategy to close the gap between measures and targets | 2- The gap is discussed and a clear strategy for closing it is outlined (this can be a process spread over time, policies need not be fully detailed, otherwise there would be no gap).<br>1- The gap is discussed and a strategy/intention is presented, with some ambiguity/limitations<br>0- No or very little discussion or strategy to close the gap | x3 | 4.7% |
| 3.1.5 | Assessment of delivery variance/risk | 2- Yes - Risks of implementation deficits are discussed and assessed (qualitatively or quantitatively)<br>1- Partially - Limited assessment/discussion of possible implementation gap<br>0- No - No assessment/discussion of possible implementation gap | x2 | 3.2% |

* rounded

# Dimension 3: Modeling

| # | Indicator | Rating scale (from best grade to worst grade, worst grade = 0, best grade = number of options -1) | Weighting in its dimension | % of total * |
|---|---|---|---|---|
| **3.2** | **Emissions modeling** | | | **12.6%** |
| 3.2.1 | Existence and credibility of top-down modeling ("*backcasting*") | 3- Decarbonization trajectory modeling + public methodology + clear demonstration of credibility and quality (e.g. aligned with ISO 14064 and 14080 or other international standards, and/or peer-reviewed, and/or open source).<br>2- Modeling decarbonization trajectories + public methodology + appearance of credibility (but no clear mechanisms to prove it, or some limitations)<br>1- Modeling of decarbonization trajectories + public methodology + limited credibility (may be obvious problems or lack of information/depth/detail)<br>0- No modeling of decarbonization trajectories, or very vague/limited information | x1 | 1.6% |
| 3.2.2 | Existence and credibility of bottom-up modeling of projected emissions reductions | 3- Modeling of reductions associated with measures + public methodology + clear demonstration of credibility and quality (e.g. aligned with international standards ISO 14064 and 14080 or others, and/or peer-reviewed, and/or open source).<br>2- Modeling of reductions associated with measures + public methodology + appearance of credibility (with limitations)<br>1- Modeling of reductions associated with measures + public methodology + limited credibility<br>0- No modeling of reductions associated with measures, or very vague/limited information | x3 | 4.7% |
| 3.2.3 | Quality of input data (primary, secondary, extrapolated) and results | 3- Information on data sources is provided + quality is discussed/evaluated + modeling results are presented as ranges or with a sensitivity analysis<br>2- Two out of three of the above<br>1- One out of three of the above<br>0- None (no presentation/discussion of data quality, no ranges) | x1 | 1.6% |
| 3.2.4 | Taking account of policy competition and other effects in attribution analysis | 3- The climate plan's emissions reduction estimates take into account (a) competition between measures, (b) "additionality" to the status quo, (c) "program effects" (opportunism, rebound, erosion, spillover, overlap, etc.).<br>2- Attribution takes into account (a-b-c), with some shortcomings<br>1- Attribution has significant gaps, does not take into account part of (a-b-c) or is generally poorly explained<br>0- No modeling of GHG reductions associated with the climate plan | x3 | 4.7% |

* rounded

# Dimension 4 & 5: Progress and Considerations

| # | Indicator | Rating scale (from best grade to worst grade, worst grade = 0, best grade = number of options -1) | Weighting in its dimension | % of total * |
|---|---|---|---|---|
| **4.1** | **Implementation** | | | **5.0%** |
| 4.1.1 | Progress on planned actions (% on track) | 5- Very much on track (>90% of actions are progressing "satisfactorily"), excluding up to 25% of non-quantifiable measures<br>4- On track (>75-90%)<br>3- Mostly on track (50-75%)<br>2- Somewhat behind (25-50%)<br>1- Very late (0-25%)<br>0- No information on degree of progress | x1 | 5.0% |
| **4.2** | **Emissions** | | | **5.0%** |
| 4.2.1 | Progress against forecast emissions reductions | 4- On track with target reduction trajectory, based on latest available data<br>3- Largely on track (small deviation from target trajectory)<br>2- At risk (medium deviation)<br>1- Very much at risk (large deviation)<br>0- No information on degree of progress | x1 | 5.0% |
| **5.1** | **Stakeholder engagement** | | | **3.3%** |
| 5.1.1 | Involving stakeholders in the climate planning process | 3- Better - same as below, + special mechanisms/support for vulnerable groups<br>2- Climate planning incorporates mechanisms that enable society's stakeholders (general public, private sector, civil society) to participate and contribute. These mechanisms are formalized and regular.<br>1- Limited - basic consultation/engagement framework, with limited formalization of the process or no integration/response obligations<br>0- No or very limited consultation/engagement framework | x1 | 3.3% |
| **5.2** | **Holistic climate planning** | | | **6.7%** |
| 5.2.1 | Integrating just transition principles | 3- Yes: the plan explicitly considers and addresses just transition issues<br>2- Partially: the plan addresses just transition in a limited way<br>1- Limited: the plan focuses solely on economic growth and job creation opportunities<br>0- None: the plan focuses exclusively on GHGs without considering societal equity and economic impacts. | x1 | 3.3% |
| 5.2.2 | Links with resilience and climate adaptation aspects | 2- Climate action plan refers to climate resilience and adaptation needs/plans and provides some analysis<br>1- Plan makes some limited references to climate resilience and adaptation, but with limited analysis/overview/synergies<br>0- Climate action plan makes little or no reference to climate resilience and adaptation | x1 | 3.3% |

* rounded

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Sensitivity analysis

# The overall ranking is not very sensitive to changes in the weighting of indicators and dimensions.

1. **Unweighted raw score**: score for each indicator, without weighting it by the relative weight of each indicator. Gives more weight to indicators that are evaluated on more points (e.g. x/5 vs. x/2), and does not properly represent the relative importance of indicators and dimensions. Out of 104 points.
2. **Weighted score**: considers the weight of each indicator (x1, x2 or x3). These weights were established according to Dunsky's judgment, considering the relative importance of an indicator for the overall evaluation. Gives more weight to indicators on more points, and does not represent well the relative importance of dimensions. Relative weights of dimensions are 28 / 40 / 24 / 4 / 4 percent. Out of 202 points.
3. **Weighted and normalized score per indicator**: like (2), and reduces all indicators to a 3-point score, whatever the original scale. Does not represent the relative importance of dimensions well. Relative weights of dimensions are 28 / 40 / 24 / 4 / 4 percent. Out of 213 points.
4. **Weighted and normalized score per indicator and dimension** - *score retained for final ranking*: as (3), and adjusts the indicator weights so that the relative weight of the dimensions in the final score is 20 / 30 / 30 / 10 / 10. This weighting was established according to Dunsky's judgment, considering the relative importance of the dimensions for the overall evaluation. Out of 213 points.
5. **Weighted and normalized score by indicator and dimension - alternative weighting**: as (4), but increases the weight of indicators 1.3.1 and 5.2.1 by one point out of 3, and decreases the weight of indicators 1.4.5, 2.4.4, 3.1.4, 3.1.4, and 3.2.4 by one point out of 3. This alternative weighting reflects internal discussions at Dunsky about the relative importance of these indicators. Whether it is applied or not, the final scores and rankings remain largely unchanged. Out of 213 points.

| | 1 | 2 | 3 | 4 - Final ranking | 5 |
|---|---|---|---|---|---|
| **Case** | **Gross score, unweighted, unsmoothed** ( /104) | **Weighted score, unsmoothed** (/202) | **Weighted score smoothed by indicator** (/213) | **Weighted and smoothed score by indicator and dimension** (/213) | **Weighted and smoothed score by indicator and dimension - alternative weighting** (/213) |
| **United Kingdom** | 78% | 79% | 80% | **78,4%** | 76,9% |
| **Ireland** | 78% | 80% | 80% | **78,0%** | 76,8% |
| **Québec** | 72% | 79% | 78% | **76,8%** | 76,3% |
| **California** | 73% | 75% | 76% | **74,0%** | 75,0% |
| **Germany** | 75% | 77% | 76% | **72,2%** | 71,8% |
| **France** | 70% | 71% | 71% | **68,3%** | 68,7% |
| **New Zealand** | 63% | 68% | 71% | **66,1%** | 67,0% |
| **Canada (Federal)** | 66% | 66% | 68% | **65,8%** | 66,1% |
| **British Columbia** | 59% | 60% | 62% | **61,6%** | 61,5% |
| **Finland** | 55% | 58% | 58% | **56,9%** | 57,7% |
| **Maine** | 53% | 53% | 53% | **52,7%** | 52,3% |
| **New York (State)** | 56% | 52% | 54% | **51,6%** | 51,8% |
| **Massachusetts** | 58% | 51% | 52% | **51,3%** | 51,9% |
| **New Brunswick** | 46% | 49% | 49% | **49,3%** | 50,0% |
| **Vermont** | 51% | 46% | 46% | **43,1%** | 43,1% |
| **Ontario** | 17% | 15% | 14% | **16,6%** | 16,4% |

# 6. Appendices

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Sources

# Data sources for the context table, section 3.1

| | |
|---|---|
| 2030 target | • Dunsky research for this mandate, based on documents from the various states |
| GHG / inhabitant | • American states = for 2021, https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals<br>• Provinces including Québec = for 2021, Canadian inventory, https://donnees.ec.gc.ca/data/substances/monitor/canada-s-official-greenhouse-gas-inventory/?lang=fr<br>• European countries: by 2021, Submissions to the United Nations Framework Convention on Climate Change (UNFCCC), https://unfccc.int/ghg-inventories-annex-i-parties/2023. For New Zealand: by 2021, https://ourworldindata.org/grapher/per-capita-ghg-emissions |
| Main source of emissions | • For United States: https://cfpub.epa.gov/ghgdata/inventoryexplorer/#allsectors/allsectors/allgas/econsect/current<br>• Europe and others: https://ourworldindata.org/co2/country/germany?country= |
| Intensity gCO2e / kWh | • For the United States (except Vermont, whose value seemed too low): Carnegie Mellon University (https://emissionsindex.org/), values for 2022. U.S. values are difficult to calculate and interpret because electricity markets often encompass several states.<br>• For Vermont: year not specified, document from 2023, https://www.legisquebec.gouv.qc.ca/fr/document/rc/Q-2,%20r.%2015<br>• For Canadian provinces: values 2021, https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/federal-greenhouse-gas-offset-system/emission-factors-reference-values.html#toc7<br>• For Canada: 2020 value, https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-canada.html#:~:text=The%20greenhouse%20gas%20intensity%20of,e%2FkWh)%20in%20202020<br>• For other countries: extract from https://app.electricitymaps.com/map, consulted October 2023, values for 2021 |
| GDP $ / inhabitant | • Provinces: StatsCan, for 2022, in current CAD, https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3610022201, divided by population<br>• United States: Bureau of Economic Analysis, US Department of Commerce, for 2022, 2023 USD, divided by population and converted from USD to CAD (1 USD = 1.39 CAD) https://apps.bea.gov/itable/?ReqID=70&step=1&acrdn=1&_gl=1*9tt7ib*_ga*MTQ3MzcwMjUxMy4xNjk4OTUxMTE2*_ga_J4698JNNFT*MTY5ODk1MTExNS4xLjEuMTY5ODk1MTMzMy4wLjAuMA..#eyJhcHBpZCI6NzAsInN0ZXBzIjpbMSwyOSwyNSwzMSwyNiwyNywzMF0sImRhdGEiOltbIlRhYmxlSWQiLCI1MzEiXSxbIk1ham9yX0FyZWEiLCIwIl0sWyJTdGF0ZSIsWyIwIl1dLFsiQXJlYSIsWyJYWCJdXSxbIlN0YXRpc3RpYyIsWyIzIl1dLFsiVW5pdF9vZl9tZWFzdXJlIiwiTGV2ZWxzIl0sWyJZZWFyIixbIjIwMjIiXV0sWyJZZWFyQmVnaW4iLCItMSJdLFsiWWVhcl9FbmQiLCItMSJdXX0=<br>• Countries: World Bank, for 2022, 2023 USD, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD, divided by population and converted from USD to CAD (1 USD = 1.39 CAD) |
| Population | • For provinces (except Québec) and Canada: Q3 2021, from CANSIM 17-10-0009-01 (formerly 051-0005), https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901&cubeTimeFrame.startMonth=01&cubeTimeFrame.startYear=2021&cubeTimeFrame.endMonth=10&cubeTimeFrame.endYear=2021&referencePeriods=20210101%2C20211001<br>• For Québec: Q3 2021 (July 1), https://statistique.quebec.ca/fr/document/population-et-structure-par-age-et-sexe-le-quebec/tableau/estimation-de-la-population-du-quebec<br>• For the United States: US census, for 2021, https://www.census.gov/data/tables/time-series/demo/popest/2020s-state-total.html<br>• For countries (except Canada): US census, for 2023, https://www.census.gov/data-tools/demo/idb/#/table?COUNTRY_YEAR=2023&COUNTRY_YR_ANIM=2023 |

Sources

# Principal documents consulted for the 16 cases compared in detail

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| QC | • Implementation Plan 2023-2028 of the Green Economy Plan 2030<br>• Green Economy Plan 2030 - Implementation Plan 2023-2028 - Impact analysis on GHG emissions and the economy<br>• Bilan 2021-2022 de l'action climatique du gouvernement du Québec (In French only)<br>• Government of Québec climate action scorecard - Implementation plan actions<br>• EPI management framework<br>• Bill 44 (2020) https://www.publicationsduquebec.gouv.qc.ca/fileadmin/Fichiers_client/lois_et_reglements/LoisAnnuelles/fr/2020/2020C19F.PDF<br>• Guidelines for quantifying GHG emission reductions linked to the actions of the Green Economy 2030 Plan and its implementation plan<br>• Certain reports by the Commissioner for Sustainable Development (2022, 2023) and the Advisory Committee on Climate Change (2021, 2023) |
| CAN | • 2030 Emissions Reduction Plan (2022)<br>• Canada Enhanced NDC Submission (2021)<br>• Canada's strengthened climate plan: A Healthy Environment and a Healthy Economy (2020)<br>• Canadian Net-Zero Accountability Act |
| BC | • CleanBC Roadmap to 2030 (2021)<br>• CleanBC (2018)<br>• Climate Change Accountability Act (2007): https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/07042_01<br>• 2022 Climate Change Accountability Report<br>• BC GHG Forecast 2022<br>• 2022 Mitigation and Climate Preparedness and Adaptation tables_2022 |
| NB | • New Brunswick's Climate Change Action Plan 2022-2027<br>• Climate Change Act: https://www.legnb.ca/content/house_business/58/4/bills/Bill-39-e.htm<br>• Climate Change Action Plan Progress Report 2022<br>• Climate Change Action Plan Progress Report 2022: Detailed Summary A<br>• Environment and Local Government Annual Report 2021 - 2022 |
| ON | • Made-in-Ontario Environment Plan (2018)<br>• Cap and Trade Cancellation Act (2018)<br>• 2022 Progress Report<br>• Ontario Emissions Scenario (2022)<br>• Powering Ontario's Growth (2023)<br>• Auditor General: Climate Change Audit (2019) and Follow-up Audit on Climate Change (2021) |

Note: this list names some of the key documents consulted, but is not exhaustive, as other elements were also considered (legal texts, committee reports, official sites, appendices, etc.).

Sources

# Main documents consulted for the 16 cases compared in detail

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|---|---|
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| NY | • Scoping Plan (2022)<br>• Climate Leadership and Protection Act (2019)<br>• GHG Inventory (2022) |
| VT | • Climate Action Plan (2021)<br>• Pathways Analysis (2022)<br>• Global Warming Solutions Act (2020)<br>• Carbon Budget<br>• 2023 Progress Report |
| NZ | • Climate Change Response (Zero Carbon) Amendment Act 2019:https://www.legislation.govt.nz/act/public/2019/0061/latest/whole.html<br>• Climate Change Response Act 2019: https://www.legislation.govt.nz/act/public/2019/0061/latest/whole.html<br>• Aotearoa New Zealand's first emissions reduction plan_2022<br>• Aotearoa New Zealand's first emissions reduction plan: Table of actions<br>• Aotearoa New Zealand's first emissions reduction plan Technical information Annex |

Note: this list names some of the key documents consulted, but is not exhaustive, as other elements were also considered (legal texts, committee reports, official sites, appendices, etc.).

Sources

# Main documents consulted for the 16 cases compared in detail

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|---|---|
| FROM | • Climate Action Plan for 2030 (CAP 2030), 2019<br>• 8th UNFCCC monitoring report (2021, for 2018-19)<br>• Climate monitoring report 2022<br>• Projection report 2023 (Aug 2023)<br>• German UNFCCC report (March 2022)<br>• Updated Climate Long-Term Strategy - submitted to UNFCCC in Nov 2022<br>• National Energy and Climate Plan (NECP) - submitted to EU, v2020<br>• Climate Protection Plan 2023 |
| FR | • National Low Carbon Strategy - SNBC<br>• Climate Action Plan of the French Ministry of Ecological Transition<br>• Haut Conseil pour le Climat, Rapport annuel 2023 - "acter l'urgence, engager les moyens" (in French only)<br>• AME 2021 summary<br>• https://www.iddri.org/fr/publications-et-evenements/billet-de-blog/planification-de-la-transition-bas-carbone-en-france |
| FI | • Carbon neutral Finland 2035 - national climate and energy strategy<br>• Medium-term Climate Change Policy Plan: Towards a carbon-neutral society<br>• Annual Climate Report 2023<br>• Climate Act (423/2022)<br>• https://www.treasuryfinland.fi/investor-relations/sustainability-and-finnish-government-bonds/carbon-neutral-finland-2035/ |
| IE | • Climate Action Plan (2023)<br>• Climate Action and Low Carbon Development (Amendment) Act 2021<br>• Quarterly Progress Reports<br>• Carbon Budgets<br>• Sectoral Emissions Ceilings<br>• 2022-2040 Emissions Projections<br>• Climate Change Advisory Council Annual Review 2023 |
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