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STRATEGIC ASSESSMENT OF CLIMATE CHANGE

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EXECUTIVE SUMMARY

In August 2019, the *Impact Assessment Act* (IAA) came into force. The IAA establishes a new process for considering environmental, health, social and economic effects of projects that will undergo a federal impact assessment. One of the factors to be considered in the impact assessment process of a designated project is the extent to which the effects of the designated project hinder or contribute to the Government of Canada's ability to meet its commitments in respect of climate change such as the Paris Agreement, Canada's 2030 target and the goal of Canada achieving net-zero emissions by 2050.

The strategic assessment of climate change will enable consistent, predictable, efficient and transparent consideration of climate change throughout federal impact assessments.

A draft strategic assessment of climate change was published in August 2019. This final version considers comments received on the August 2019 version and reflects the Government's goal of net-zero emissions by 2050.

This strategic assessment of climate change:

- describes the greenhouse gas (GHG) and climate change information that project proponents need to submit at each phase of a federal impact assessment;
- requires proponents of projects with a lifetime beyond 2050 to provide a credible plan that describes how the project will achieve net-zero emissions by 2050; and
- explains how the Impact Assessment Agency of Canada (IAAC) or lifecycle regulators, with support from expert federal authorities, will review, comment on and complement the climate change information provided by proponents.

Environment and Climate Change Canada (ECCC) plans to review and update the strategic assessment of climate change every 5 years.

GLOSSARY

Best Available Technologies / Best Environmental Practices (BAT/BEP) – the most effective technologies, techniques, or practices, including emerging technologies, that can be technically and economically feasible for reducing GHG emissions during the lifetime of the project.

Carbon leakage – the situation that may occur if economic activity moves to other countries with less stringent emissions constraints, which could lead to an increase in global emissions.

Carbon sink – the ability of a forest, ocean or other natural environment to absorb carbon dioxide from the atmosphere.

Climate change resilience – the ability of a system (built, natural, social or economic) to anticipate, withstand, recover, adapt to and transform in response to a climate-related hazard.

Downstream GHG emissions – the emissions that may occur after the project, including emissions resulting from the end use of products made by a project.

Lifecycle regulators – agencies that regulate a project from planning through to project abandonment. These agencies include the Canada Energy Regulator (CER), the Canadian Nuclear Safety Commission (CNSC) and the Offshore Petroleum Boards.

Net GHG emissions – see Section 3.

Offset credits – Represent GHG emission reductions or removals generated from activities that are additional to what would have occurred in the absence of the offset project (i.e., generated from activities that go beyond legal requirements and a business-as-usual standard). Each offset credit generated by an offset project represents one tonne of carbon dioxide equivalent (CO_2eq) reduced or removed from the atmosphere.

Projects undergoing a federal impact assessment – projects under the IAA, as well as projects under review by lifecycle regulators.

Upstream GHG emissions – emissions from all stages of production, from the point of resource extraction or utilization to the project under review.

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1. INTRODUCTION

1.1. Objective

The strategic assessment of climate change will enable consistent, predictable, efficient and transparent consideration of climate change throughout the impact assessment process. It describes the climate change-related information requirements throughout the federal impact assessment process, and requires proponents of projects with a lifetime beyond 2050 to provide a credible plan to achieve net-zero emissions by 2050. It also explains how the Impact Assessment Agency of Canada (IAAC) or lifecycle regulators, with support from expert federal authorities, will review, comment on and complement this information.

Environment and Climate Change Canada (ECCC) plans to review and update the strategic assessment of climate change every 5 years.

1.2. Application

The strategic assessment of climate change applies to designated projects under the *Impact Assessment Act* (IAA).

The principles and objectives underlying the strategic assessment of climate change will be built into guidance for the review of non-designated projects on federal lands and outside Canada under the IAA. Guidance for projects regulated by the Canada Energy Regulator (CER) will similarly consider the principles and objectives of the strategic assessment of climate change.

The strategic assessment of climate change may also apply to environmental reviews by other federal lifecycle regulators, and be used in regional assessments.

1.3. Using this document

The strategic assessment of climate change complements other policy and guidance documents that support the impact assessment process. It is assumed that readers of this document have a good understanding of the impact assessment process.[1]

[1] For more information on the impact assessment process, please consult the IAAC website at: https://www.canada.ca/en/impact-assessment-agency.html

This document is organized as follows:

Section 2: Context

Provides an overview of Canada's climate change commitments, of Canada's impact assessment system, and of the process for conducting the strategic assessment of climate change.

Section 3: Quantification of GHG Emissions from a Project

Provides guidance on how to quantify a project's GHG emissions, and identifies the conditions when an upstream GHG assessment is required.

Section 4: Climate Change in the Planning Phase

Outlines how the information related to GHG emissions and climate change provided in the Planning Phase will be used to develop the Tailored Impact Statement Guidelines.

Section 5: Climate Change in the Impact Statement Phase

Outlines the information that will be asked for all projects, when an upstream GHG assessment will be required, and when a credible plan to achieve net-zero emissions by 2050 will be required.

Section 6: Climate Change in the Impact Assessment Phase

Outlines how IAAC and relevant lifecycle regulators will analyze the information provided by proponents in the Impact Statement and complement it with input from expert federal authorities.

Section 7: Climate Change in Decision-Making and Conditions

Explains how the information related to GHG emissions and climate change will inform the decision on the project and conditions related to project approvals.

Section 8: Climate Change in the Post-Decision Phase

Explains how a follow-up program, if required, could be used to ensure the proponent is meeting any conditions related to GHG emissions and climate change.

Section 9: Contact information

Provides contact information for the strategic assessment of climate change.

2. CONTEXT

2.1. Canada's climate change commitments

The Paris Agreement is an international agreement to strengthen the global response to the threat of climate change, building on the United Nations Framework Convention on Climate Change. The Paris Agreement, which entered into force in November 2016, established a collective long-term goal to hold the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels, and to pursue efforts to limit that increase to below 1.5 degrees.[2] The Paris Agreement also establishes a global goal of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal.[3]

Since 2016, the Government of Canada has been working with provinces, territories, and Indigenous peoples, to implement the Pan-Canadian Framework on Clean Growth and Climate Change. This plan outlines over 50 concrete measures to reduce carbon pollution, help us adapt and become more resilient to the impacts of a changing climate, spur clean technology solutions, and create good jobs that contribute to a stronger economy.

In Fall 2019, the Government of Canada announced further commitments to strengthen existing, and introduce new, actions to exceed Canada's 2030 emission reduction target, and to develop a plan to set Canada on a path to achieve a prosperous net-zero emissions future by 2050.

The IAA establishes a process for considering the environmental, health, social and economic effects within federal jurisdiction of certain projects for determining whether those projects are in the public interest.[4] Among other factors, the IAA requires that this decision account for the extent to which the effects of the designated project hinder or contribute to the Government of Canada's ability to meet its commitments in respect of climate change.

Other features of the IAA include:

- A planning phase to allow for early engagement, increased efficiency, improve project design, and give project proponents certainty about the next steps, requirements and timelines in the process;
- Indigenous engagement and partnership throughout the process;
- Increased public participation opportunities within legislated, prescribed timelines;
- Legislated timelines, tailored impact assessment guidelines and rigorous timeline management to provide clarity and regulatory certainty;
- Strong follow-up, monitoring and enforcement; and
- Transparent decisions based on science and Indigenous knowledge.

IAAC leads assessments of designated projects under the IAA. Where projects link to lifecycle regulators – such as the CER and the Canadian Nuclear Safety Commission (CNSC), IAAC will work in collaboration with them to draw on their expert knowledge and ensure that safety, licensing requirements, international obligations and other relevant regulatory factors are considered as part of a single, integrated assessment.

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2 For more on Canada's international action on climate change, visit: https://www.canada.ca/en/services/environment/weather/climatechange/canada-international-action.html

3 For more information on the Paris Agreement, visit: https://www.canada.ca/en/environment-climate-change/services/climate-change/paris-agreement.html

4 For more information, visit https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance.html

2.2. Technical guides

ECCC plans to publish technical guides to provide additional details on specific elements of the strategic assessment of climate change in 2020-2021, such as:

- Quantification of net greenhouse gas (GHG) emissions, upstream GHG emissions, and carbon sinks;
- GHG mitigation measures, Best Available Technologies / Best Environmental Practices (BAT/BEP) and plans to achieve net-zero emissions by 2050; and
- Climate change resilience.

3. QUANTIFICATION OF GHG EMISSIONS FROM A PROJECT

Proponents of projects undergoing a federal impact assessment will be required to provide an estimate of the project's GHG emissions and, in certain cases, an upstream GHG emission assessment. An estimate of downstream emissions is not required.

A consistent and coherent approach to quantifying a project's GHG emissions will ensure fairness during the impact assessment process and accurate emission intensity comparisons with comparable projects.

While the general approach to quantify GHG emissions is provided in this document, ECCC plans to publish a technical guide with additional detailed guidance on how to quantify a project's net and upstream GHG emissions.

The GHG emissions for new projects and replacement or expansion projects are assessed differently. For new projects, the GHG emissions should reflect the full design capacity of the project. For replacement[5] or expansion projects, GHG emissions are assessed based on the additional capacity the project creates in comparison to the original design capacity.

3.1. Quantification of a project's net GHG emissions

3.1.1. Net GHG emissions calculation

The *Information and Management of Time Limits Regulations*[6] under the IAA set out the information that proponents are required to provide in their initial and detailed Project Descriptions, which includes an estimate of any GHG emissions associated with the project. This should be calculated as the net GHG emissions associated with the project and estimated based on the information available to proponents at each stage. An initial estimate would be provided in the initial Project Description, updated in the detailed Project Description, and further refined in the Impact Statement as more information becomes available. Equation 1 defines net GHG emissions.

Equation 1: Net GHG emissions

Net GHG emissions =
Direct GHG emissions
+ Acquired energy GHG emissions
- CO_2 captured and stored
- Avoided domestic GHG emissions
- Offset credits

In the Impact Statement, each term of equation 1 must be reported separately for each year of the project lifetime (i.e., for all phases of the project: construction, operation and decommissioning).

Project proponents must provide the methodologies, a description of the model if a model is used, data, emission factors and any assumption used to estimate a project's net GHG emissions.

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5 Replacement projects must use similar fuel and technology.

6 *Information and Management of Time Limits Regulations*

Direct GHG emissions: GHG emissions generated by activities that are within the defined scope of the project. (Note: If transportation of products beyond the project is included in the scope of the project, then emissions generated by that transportation are to be included as direct GHG emissions.)

Examples of direct emissions include:

- Emissions from land use change (e.g., land clearing including deforestation, biomass decay, etc.);
- Emissions from mobile combustion (e.g., vehicle, machinery, etc.);
- Emissions from stationary combustion (e.g., boilers, burners, reciprocating engines, etc.);
- Emissions from industrial process (e.g., chemical, mineral and metal production, incineration, etc.); and
- Flaring, venting and fugitive emissions.

Acquired energy GHG emissions: GHG emissions associated with the generation of electricity, heat, steam or cooling, purchased or acquired from a third-party for the project. Examples of acquired energy GHG emissions include: emissions associated with the generation of purchased or acquired electricity from the grid, and of purchased or acquired steam, heat or cooling from an adjacent facility. Upstream GHG emissions, as defined in Section 3.2, are assessed separately and are not included in this definition.

CO_2 captured and stored: CO_2 emissions that are generated by the project and permanently stored in a storage project that meets the following criteria:

- the geological site into which the CO_2 is injected is a deep saline aquifer for the sole purpose of storage of CO_2, or a depleted oil reservoir for the purpose of enhanced oil recovery; and
- the quantity of CO_2 stored for the purposes of the project is captured, transported and stored in accordance with the federal, provincial, U.S., or state laws.

Avoided domestic GHG emissions: GHG emissions that are reduced or eliminated in Canada as a result of the project. The avoided GHG emissions only apply to the project's net GHG emissions (i.e., not to any upstream emissions calculations).

The following examples illustrate avoided GHG emissions:

- In the case of an expansion project, the emissions reduction resulting from the replacement of existing equipment with more energy-efficient equipment on the project site.
- In the case of a new project, the emissions reduction resulting from the replacement of a high-emitting facility with a lower-emitting facility.
- In the case of any facility that generates and sells surplus energy, the amount of emissions saved from producing that energy from the previous, higher-emitting source.
- In the case of mitigation measures additional to the project and not reflected in the project's direct GHG emissions, the GHG emissions removed as a result of these mitigation measures. This would include, for example, the use of direct air capture technology and afforestation.

Infrastructure Canada's Climate Lens – General Guidance[7] provides general guidance on how to quantify avoided emissions. The proponent must select the appropriate "total net baseline scenario emissions" and the "total net baseline scenario removals", and provide the rationale for those scenarios. The scenarios must consider new measures (e.g., policies, regulations, plans and programs) applicable to the project put in place by provincial, territorial and federal governments, be realistic, conservative and take into account market conditions and feasibility.

[7] Climate Lens - General Guidance

The quantification approach should ensure that the avoided emissions represent reductions or removals that are real, additional, quantified, verifiable, unique, and permanent.

Avoided foreign emissions should not be quantified in the avoided domestic GHG emissions. Proponents will have the opportunity to discuss potential impacts of their project on global GHG emissions. Section 5.1.3 describes this consideration. Further details on quantification of avoided domestic GHG emissions will be included in the technical guide on GHG quantification.

Offset credits: Represent GHG emission reductions or removals generated from activities that are additional to what would have occurred in the absence of the offset project (i.e., generated from activities that go beyond legal requirements and a business-as-usual standard). Each offset credit generated by an offset project represents one tonne of carbon dioxide equivalent (CO_2eq) reduced or removed from the atmosphere.

Offset credits must:

- Not have been retired / cancelled for any other purpose, including:
  - compliance with any regulatory requirement;
  - voluntary claims by the proponent (i.e., for purposes unrelated to the impact assessment); or
  - compliance or voluntary purposes by any other entity.
- Be sourced from a project that is registered in a Canadian regulatory offset program that aligns with the best practices outlined in the Canadian Council of Ministers of the Environment Pan-Canadian Offsets Framework.[8]
- Be issued on the basis of the GHG reductions and removals that have already occurred, instead of on the basis of expected reductions or removals.
- Be verified to a reasonable level of assurance by an accredited third-party verification body.
- Be sourced from project activities that are verifiable, quantifiable, additional to a business-as-usual scenario and a project baseline that incorporates legal or regulatory requirements.

In addition:

- Offset credit vintages can be no more than 5 years prior to the year in which direct or indirect emissions of the project have been calculated.
- With the exception of offsets that satisfy the next criterion, offset credits must be sourced from offset projects in Canada, and represent emission reductions of one or more of the greenhouse gases included in Canada's most recent version of the National Inventory Report.
- Foreign offset credits will only count if they fully comply with the rules for Internationally Transferred Mitigation Outcomes (ITMOs) established in Article 6 of the Paris Agreement, all applicable decisions adopted by the Conference of the Parties and any further criteria for international offsets to be developed by ECCC. For example, international offset credits must represent real, quantified and additional mitigation outcomes, which have been authorized by the host country for use toward Canada's national emissions targets under the Paris Agreement, and are subject to robust accounting to avoid double-counting.
- Proponents should provide an annual report with information on the offsets retired or cancelled for the previous year.

[8] Pan-Canadian Greenhouse Gas Offsets Framework

3.1.2. *Emission intensity calculation*

In addition to providing the project's net GHG emissions, the proponent will provide the estimated GHG emission intensity using Equation 2.

Equation 2: Emission intensity calculation

$$\text{Emission Intensity} = \frac{\text{Net GHG Emissions}}{\text{Units Produced}}$$

The proponent must calculate the emission intensity estimate for each year of the operation phase of the project. The emission intensity and units produced must be reported separately for each year of the operation phase of the project.

The emission intensity will be used to compare the project to similar high-performing, energy-efficient project types in Canada and internationally in the Impact Statement. The emission intensity units will be specified in the Tailored Impact Statement Guidelines; the emission intensity estimate may not be possible nor relevant for some project types.

3.2. Assessing a project's upstream GHG emissions

3.2.1. *Overview*

Upstream emissions are the domestic and non-domestic emissions from all stages of production, from the point of resource extraction or utilization, to the project under review.

In 2016, the Government of Canada published a draft methodology for estimating upstream GHG emissions in *Canada Gazette, Part I*.[9] An upstream GHG assessment has two parts:

- **Part A** is a quantitative estimate of upstream GHG emissions associated with the project based on the project's maximum throughput or capacity (new project) or additional throughput or capacity (replacement or expansion project). This requires information on the methodology, data, assumptions, and approach to estimating those upstream GHG emissions.
- **Part B** is a qualitative discussion about the incrementality of the upstream GHG emissions estimated in Part A. It provides the conditions under which the upstream emissions estimated in Part A could be expected to occur regardless of whether the project proceeds.

3.2.2. *When an upstream GHG emissions assessment will be required*

Proponents of projects likely to exceed the upstream GHG emissions threshold outlined in Table 1 will need to complete an upstream GHG assessment. The upstream GHG emissions threshold declines over time.

Table 1: Upstream GHG emissions thresholds for conducting an upstream GHG assessment

PUBLICATION YEAR OF TAILORED IMPACT STATEMENT GUIDELINES	UPSTREAM GHG THRESHOLD (KT CO_2 eq/YEAR)
2020-2029	500
2030-2039	300
2040-2049	200
2050 and beyond	100

The Tailored Impact Statement Guidelines will confirm if an upstream GHG assessment is required in the Impact Statement based on preliminary calculations conducted by IAAC with the support of expert federal authorities.

[9] Draft methodology for estimating upstream GHG emissions in *Canada Gazette*, Part I

3.3. Discussion on the development of emissions estimates and uncertainty assessment

Project proponents should describe the uncertainty associated with their project's net and upstream GHG emissions estimates. This description can be qualitative, although quantitative estimations of uncertainty should also be included where available.

Two types of uncertainty should be considered: i) uncertainty related to data and ii) uncertainty related to methods and models.

The discussion of uncertainty related to data should identify any assumptions made in selecting the data, its applicability to the project, its representativeness, and its completeness. The discussion should explain how the data may be improved with more certainty on the project design and variables (type and volume of fuel used for example). A comparison of the data to comparable data sets may inform the uncertainty discussion. The discussion of uncertainty should also acknowledge that the uncertainty of GHG emissions estimates generally increases for years further out into the future.

The discussion on uncertainty of the methods and models, if applicable, should list the assumptions related to the method or model used and their rationale. The uncertainty could be represented using different methods and models, or by developing scenarios with varying data inputs to generate a range of reasonable emissions. There could be scenarios related to changes in project design and scenarios related to external considerations that may affect a project's GHG emissions over time. Examples include a qualitative discussion on how the economics surrounding the project could influence the project's emissions, such as the price of commodities, and how the emissions could change depending on the type of equipment, fuel or other source of energy used.

Finally, the discussion on uncertainty should describe how the uncertainty of the emissions estimates was reduced.

Further guidance on the development of the emissions estimates will be provided in the technical guide on quantifying GHG emissions for projects.

4. CLIMATE CHANGE IN THE PLANNING PHASE

Projects subject to the IAA will go through a Planning Phase in which potential impacts are discussed with the public and with Indigenous peoples at the outset of the impact assessment process. The information collected in the Planning Phase will inform the Tailored Impact Statement Guidelines, which will outline the scope and information related to climate change required in the Impact Statement.

Information related to the project's GHG emissions and climate change will be provided through three avenues during the Planning Phase:

1. **The initial and detailed Project Description**, which includes: the project type, its purpose and an estimate of its GHG emissions, which should be calculated as net GHG emissions.
2. **Engagement with Indigenous peoples, local communities, other jurisdictions, the public, and federal authorities.** Following engagement on the initial Project Description, IAAC (or relevant body) will prepare a Summary of Issues. This will outline the issues it considers relevant to the assessment, informed by the input from Indigenous peoples, stakeholders, other jurisdictions and the public during early engagement on the project and the expertise of federal departments.
3. **Additional information provided by the proponent** during the Planning Phase, such as the proponent's response to the Summary of Issues, and any other information provided by the proponent at its discretion.

4.1. Initial and Detailed Project Description

The *Information and Management of Time Limits Regulations*[10] under the IAA set out the information that proponents must provide in their initial and detailed Project Descriptions. On GHG emissions and climate change, proponents are required to provide an estimate of the project's GHG emissions, and are encouraged to provide information on GHG mitigation measures to be considered in the Impact Statement.

4.1.1. GHG emissions estimates

The *Information and Management of Time Limits Regulations* require project proponents to provide an estimate of any GHG emissions associated with the project. To fulfill this requirement, the following information should be provided in initial and detailed Project Descriptions:

- estimate of the maximum annual net GHG emissions for each phase of the project, including a breakdown of each term of Equation 1; and
- the methodology, data, emission factors and assumptions used.

4.1.2. Carbon sinks

The *Information and Management of Time Limits Regulations* require project proponents to provide a description of the physical and biological environment of the project's location. Project proponents should provide the following information to help IAAC, or the relevant lifecycle regulators, with the support of expert federal authorities, understand the potential impacts on carbon sinks:

- a description of the activities that would result in an impact on carbon sinks; and
- land areas expected to be impacted by the project, by ecosystem type (forests, cropland, grassland, wetlands, built-up land) over the course of the project lifetime, including any areas of restored or reclaimed ecosystems.

[10] *Information and Management of Time Limits Regulations*

4.1.3. Alternative means of carrying out the project

The *Information and Management of Time Limits Regulations* require project proponents to list (for the initial Project Description) or describe (for the detailed Project Description) the potential alternative means of carrying out the project that are technically and economically feasible, including through the use of best available technologies.

When evaluating alternative means of carrying out the project, project proponents should discuss the potential impacts of the alternatives on GHG emissions and how GHG emissions were considered as a criterion in the alternatives selection.

Project proponents are also encouraged to provide information on the measures being considered to reduce the project's GHG emissions on an ongoing basis. These measures could include technologies and practices to reduce the project's GHG emissions.

For projects with a lifetime beyond 2050, proponents are encouraged to provide an overview of the measures being considered to ensure projects are net-zero emissions by 2050.

4.2. Tailored Impact Statement Guidelines

The scope of information related to GHG emissions and climate change in the Impact Statement will be tailored to the project in the Tailored Impact Statement Guidelines published by IAAC at the end of the Planning Phase.

All projects undergoing a federal impact assessment will be required to provide information with respect to GHG emissions, impact of the project on carbon sinks, impact of the project on federal emissions reduction efforts and on global GHG emissions, GHG mitigation measures, and climate change resilience.

Proponents of projects with **upstream GHG emissions likely greater than or equal to the threshold** outlined in Table 1 (refer to Section 3.2.2) will also be asked to provide an upstream GHG assessment (refer to Section 5.2).

Proponents of projects with a **lifetime beyond 2050 will be asked to provide a credible plan** for the project to achieve net-zero emissions by 2050 (refer to Section 5.3).

Other information that may arise in the Planning Phase, either provided by the proponent in the initial or detailed Project Description, or from engagement on the Summary of Issues prepared by IAAC or relevant body, may be considered in determining the scope and type of information that will be requested in the Impact Statement. For example, a description of any potential benefits of the project with respect to GHG emissions and climate change provided by the proponent in the Project Description could be considered in tailoring the scope and type of information that will be asked for in the Impact Statement.

5. CLIMATE CHANGE INFORMATION IN THE IMPACT STATEMENT PHASE

Following the publication of the Tailored Impact Statement Guidelines for the project, the proponent will prepare an Impact Statement that adheres to the Tailored Impact Statement Guidelines. Information provided in the Impact Statement will be reviewed by IAAC, or relevant lifecycle regulators, with the support of expert federal authorities in the Impact Assessment Phase, as outlined in Section 6.

5.1. Information to be provided for all projects

All project proponents will be asked to provide information on GHG emissions, impact of the project on carbon sinks, impact of the project on federal emissions reduction efforts and on global GHG emissions, mitigation measures and climate change resilience.

5.1.1. GHG emissions

Project proponents must provide:

- A description of each of the project's main sources of GHG emissions and their estimated annual GHG emissions over the lifetime of the project;
- Net GHG emissions by year for each phase of the project based on the project's maximum throughput or capacity (new project) or additional throughput or capacity (replacement or expansion project) (refer to Section 3.1.1);
- Each term of Equation 1 (direct GHG emissions, acquired energy GHG emissions, CO_2 captured and stored, avoided domestic GHG emissions and offset credits, if applicable), per year for each phase of the project (refer to Section 3.1.1);
- Emission intensity for each year of the operation phase of the project (refer to Section 3.1.2);
- The quantity and a description of the "units produced" used in Equation 2 for each year of the operation phase of the project (refer to Section 3.1.2);
- Methodology, data, emission factors and assumptions used to quantify each element of the net GHG emissions (refer to Section 3.1.1);
- A discussion on the development of emissions estimates and uncertainty assessment (refer to Section 3.3); and
- A description of large sources of GHG emissions that may be the consequence of accidents or malfunctions.

5.1.2. Impact of the project on carbon sinks

The calculation of a project's net GHG emissions accounts for emissions related to land-use change. Proponents must also provide a qualitative description of the project's positive or negative impact on carbon sinks. This is because some projects may improve or reduce the ability of an ecosystem, land area or ocean to absorb carbon dioxide from the atmosphere. An impact on a carbon sink implies the interruption or alteration of a natural continual process that removes carbon from the atmosphere.

This information must include:

- Description of project activities in relation to significant landscape features such as topography, hydrology and regionally dominant ecosystems.
- Land areas directly impacted by the project, by ecosystem type (forests, cropland, grassland, wetlands, built-up land) over the course of the project lifetime; this includes the areas of restored or reclaimed ecosystem(s).
- Initial carbon stocks in living biomass, dead biomass and soils (by ecosystem type) on land directly impacted by the project over the course of the project lifetime.
- Fate of carbon stocks on directly impacted land, by ecosystem type: immediate emissions, delayed emissions (timeframe), storage (e.g., in wood products).
- Anticipated land cover on the impacted land areas after the project is in place.

ECCC is developing an approach to estimate losses or gains to carbon sinks. ECCC will provide that approach in the technical guide on GHG Quantification. Once the methodology is published in the technical guide, proponents will be required to provide a quantitative and qualitative description of the project's positive or negative impacts on carbon sinks. Estimating quantitative impacts of a project on carbon sinks amounts to estimating the reduction (or increase) in the quantity of carbon that an area would have accumulated without the project, over the project lifetime.

5.1.3. Impact of the project on federal emissions reduction efforts and on global GHG emissions

Proponents must provide in their Impact Statement:

- An explanation of how the project may impact **Canada's efforts to reduce GHG emissions**, if applicable. For some projects, there will be nothing to add in this section. For some, however, the Impact Statement may be able to explain how the project would result in GHG emission reductions in Canada (e.g., by replacing higher-emitting activities).
- A discussion on how the project could **impact global GHG emissions**, if applicable. This could include, for example:
  - If there is a risk of carbon leakage if the project is not built in Canada, the Impact Statement could include an explanation of the likelihood and possible magnitude of carbon leakage if the project is not approved.
  - If the project may displace emissions internationally, the Impact Statement could describe how the project is likely to result in global emission reductions. For example, a project that enables the displacement of high-emitting energy abroad with lower-emitting energy produced in Canada could be considered as having a positive impact.

5.1.4. GHG mitigation measures

In the Impact Statement, proponents must describe the mitigation measures they will take to minimize GHG emissions throughout all phases of the project. Proponents will be asked to conduct a BAT/BEP Determination for their project, including an assessment of emerging technologies. The BAT/BEP Determination will play an important role in the Impact Assessment Phase as it may inform the enforceable conditions imposed on the project if it is approved.

For all projects proceeding to the Impact Assessment Phase, the proponent will be asked to provide in the Impact Statement:

- A BAT/BEP Determination to identify ways to minimize the project's direct GHG emissions (refer to Section 5.1.4.1).
- A description of any additional mitigation measures (such as direct air capture technology and afforestation) that will be taken to mitigate remaining GHG emissions, if applicable.
- A description of any offset credits that have been or will be obtained to mitigate remaining GHG emissions, if applicable. Proponents may also provide information on their intent to acquire or generate international offset credits. Offset credits must comply with the criteria in Section 3.1.1, and will be considered as the last option in terms of GHG mitigation measures.
- A description of measures taken to mitigate the project's impact on carbon sinks, including measures to restore disturbed carbon sinks, if applicable.
- Subject to the public availability of information, a comparison of the project's projected GHG emission intensity to the emission intensity of similar high-performing, energy-efficient project types in Canada and internationally. If applicable, the comparison should explain why the emission intensity of the project is different.
- A list of the federal, provincial or territorial GHG legislation, policies or regulations that will apply to the project.

5.1.4.1. Best Available Technologies / Best Environmental Practices Determination

BAT/BEP are defined as the most effective technologies, techniques, or practices, including emerging technologies, that can be technically and economically feasible for reducing GHG emissions during the lifetime of the project.

This assessment is to be conducted to confirm that the project's design will minimize direct GHG emissions, in line with the boundaries of the project undergoing the federal impact assessment. Setting the scope of the analysis at the project level, instead of the equipment level, gives project proponents flexibility to optimize the project's overall design while demonstrating the use of BAT/BEP.

The BAT/BEP Determination process is outlined in Table 2.

Table 2: BAT/BEP Determination

PROCESS STEP	INFORMATION REQUIREMENT
Listing	Proponent establishes a list of all technologies and practices, including emerging technologies, based on the identified sources of emissions for the project during its lifetime.
Technical Feasibility Assessment	Proponent eliminates options determined to not be technically feasible, providing rationale. Proponent describes the timing and circumstances in which the eliminated options could become technically feasible.
GHG Reduction Potential Assessment	Proponent ranks remaining options based on GHG reduction potential.
Economic Feasibility Assessment and Additional Considerations	Proponent eliminates options determined to not be economically feasible, providing rationale. Proponent describes the timing and circumstances in which the eliminated options could become economically feasible. Proponent outlines additional environmental, social, or other considerations, providing rationale.
Selection of BAT/BEP	Proponent describes the technologies and practices to be used in the Project, and provides a justification for selecting any technology or practice that is not a BAT/BEP. Proponent provides information on how the options eliminated because of technical and economical unfeasibility could be phased in during the project lifetime, including how they could be considered during periods of project maintenance and facility upgrades.
Review	IAAC or the relevant lifecycle regulator, with support from expert federal authorities, reviews the BAT/BEP Determination and requests additional information if required.

The conclusion of the BAT/BEP Determination will be provided in the Impact Statement, and will include:

- The technologies that will be used to mitigate the project's GHG emissions. These could include, for example, the use of low-emitting technologies, the use of low-carbon or renewable fuel, electrification, or carbon capture and storage.
- The practices that will be taken to mitigate the project's GHG emissions, such as anti-idling practices for mobile equipment, leak detection and repair systems, continuous monitoring systems, or fleet optimization.
- The additional technologies and practices that could be considered during periods of project maintenance and facility upgrades to further reduce the project's GHG emissions through the lifetime of the project, as well as the planning process, timing and circumstances for that consideration.

ECCC plans to publish a technical guide to help project proponents conduct their BAT/BEP determination by providing additional information on technical, economic, social and environmental considerations.

5.1.5. Climate change resilience

A commitment in the Paris Agreement, climate change resilience aims to strengthen the global response to climate change. Adaptation and resilience is also a pillar of the Pan-Canadian Framework on Clean Growth and Climate Change, which recognizes that the impacts of climate change are already being felt across Canada. Climate change may alter the likelihood or magnitude of sudden weather events such as extreme precipitation that can contribute to flooding, as well as contribute to longer-term changes such as sea level rise, permafrost thaw and changes to migration patterns. Changes related to warming are already evident in many parts of Canada, and are projected to continue in the future with further warming. If not properly considered, such changes may cause issues such as equipment failures that can threaten the environment, human health and safety, interrupt essential services, disrupt economic activity, and require high costs for recovery and replacement.

All proponents will be required via the Tailored Impact Statement Guidelines, to provide information in the Impact Statement on how the project is resilient to and at risk from both the current and future impacts of a changing climate. This information will include descriptions of:

- the scope and timescale of the climate change resilience assessment and of the methods used to identify, evaluate and manage the climate risks that could affect the project itself and thereby the surrounding environment; and
- the project's vulnerabilities to climate change both in mean conditions and extremes over the full project lifetime from project construction to decommissioning. This could include the impacts of extreme weather events on project infrastructure, impacts to water quality and availability, etc.

ECCC plans to publish a technical guide to provide further instructions and details on the level of information for the climate change resilience assessment.

The resilience assessment should consider multiple scenarios, and should discuss the assumptions and data sources used and the confidence or uncertainty in the results. Where in-house models or forecasts are developed to support a specific assessment, the modeling methodology, assumptions, statistical certainty and data sources should be provided.

In general, given the inherent uncertainty and ongoing research in projecting future climate and associated impacts, proponents should look to global climate model projections of future climate, models of potential impacts and expert advice to inform how their project is resilient to climate change.

Proponents are encouraged to draw from reports such as the current national assessment, Canada in a Changing Climate: Advancing our Knowledge for Action, which was launched in 2017.[11] This series of reports outlines the state of knowledge pertaining to changes in Canada's climate, the impacts of these changes, and how we are adapting to reduce risk. The first report in this series is Canada's Changing Climate Report.[12]

Infrastructure Canada's Climate Lens - General Guidance[13] provides general information on conducting climate change resilience assessments, including guidance for assessing climate impacts and risks to a project, as well as a variety of resources to assist proponents in undertaking such analysis.

Information about how to access and use historical and future climate data can be obtained from the Canadian Centre for Climate Services (CCCS), established by the Government of Canada so that Canadians have the information and support they need to understand and reduce the risks from climate change.

5.2. Upstream GHG emissions assessment

Proponents of projects with upstream GHG emissions likely greater than or equal to the thresholds outlined in Table 1 (refer to Section 3.2.2) will be required in the Tailored Impact Statement Guidelines to provide an upstream GHG assessment and related uncertainty assessment (refer to Section 3.3).

5.3. Plan to achieve net-zero emissions by 2050

Proponents of projects with a lifetime beyond 2050 will be required to provide a credible plan that describes how the project will achieve net-zero emissions by 2050. This plan will complement and be informed by the proponent's GHG mitigation measures (refer to Section 5.1.4).

This plan will need to demonstrate how the net GHG emission equation in Section 3.1.1 (Equation 1) will equal 0 kt CO_2 eq / year by 2050 and thereafter for the remainder of the lifetime of the project.

Proponents may identify any supportive actions by the Government that they would need in order to be able to achieve net-zero emissions. This could include, for example, identifying the need for the construction of a grid intertie to enable access to clean electricity.

The plan to achieve net-zero emissions does not apply to upstream GHG emissions, even if an upstream GHG emissions assessment was conducted.

[11] Canada in a Changing Climate

[12] Canada's Changing Climate Report (2019)

[13] Climate Lens - General Guidance

6. CLIMATE CHANGE IN THE IMPACT ASSESSMENT PHASE

IAAC or the lifecycle regulator, with the support of expert federal authorities, will review, comment on and complement, as needed, the GHG and climate change-related information provided by project proponents in their Impact Statements. This may include consideration of the methodologies, data, emission factors and assumptions used by the proponent, as well as comments received by the public and Indigenous peoples on the Impact Statement.

IAAC or the lifecycle regulator, with the support of expert federal authorities, will review, comment on and complement, as needed the information about federal, provincial or territorial climate policies and measures that will apply to the project. This will not involve an assessment or commentary on the adequacy of these policies and measures, but will ensure that IAAC or the lifecycle regulator has complete information about all applicable policies and measures and their implication for the project.

In reviewing the project, IAAC or the lifecycle regulator, with the support of expert federal authorities, will consider mitigation measures that are in use in similar high-performing, energy-efficient project types, and will compare the project's emission intensity with similar projects in Canada and internationally. For projects with a lifetime beyond 2050, IAAC or the lifecycle regulator will review the proponent's plan to achieve net-zero emissions by 2050 and will also consider the supportive government actions identified by the proponent in order for the project to be able to achieve net-zero emissions.

Finally, IAAC or the lifecycle regulator, with the support of expert federal authorities, may provide supplemental analysis on the project's (net and upstream) GHG emissions in the context of Canada's emissions targets and forecasts, including the goal for Canada to achieve net-zero emissions by 2050, Canada's 2030 emissions targets and Canada's Mid-Century Long-Term Low-Greenhouse Gas Development Strategy. This may include considering, for example, whether the project's emissions are built into the sector projections in ECCC's national forecast in Canada's National Communications and Biennial Reports submitted to the United Nations Framework Convention on Climate Change.

IAAC or the lifecycle regulator, with the support of expert federal authorities, will also review, comment on and complement, as needed, the proponent's climate change resilience assessment.

The review and analysis of the Impact Statement by IAAC or the lifecycle regulator, with the support of expert federal authorities, will be made available to the public and decision-makers.

7. CLIMATE CHANGE IN DECISION-MAKING AND CONDITIONS

Under the IAA, the Minister or Governor in Council[14] must decide whether the project is in the public interest.

The IAA also requires that the Minister or Governor in Council consider, among other factors, the extent to which the effects of the project hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change. The information provided by project proponents pursuant to the guidance in this strategic assessment of climate change, together with the analysis of that information by IAAC or the lifecycle regulator, will ensure that assessment decisions account for a project's likely climate change-related effects. Decision-makers will be provided with analysis, including but not limited to, the project's GHG emissions in the context of Canada's emissions targets and forecasts, such as Canada's 2030 emissions targets, Canada's Mid-Century Long-Term Low-Greenhouse Gas Development Strategy, and Canada's goal for achieving net-zero emissions by 2050.

The Minister will issue a decision statement on whether the project is in the public interest. If the project is in the public interest and allowed to proceed, the decision statement will contain **enforceable conditions**, as well as the rationale for the decision. The GHG emissions-related conditions would only be applicable to a project's net GHG emissions, not to upstream activities even if an upstream GHG assessment was conducted. The GHG emissions-related **enforceable conditions** may refer to **mitigation measures and other requirements** to reduce or control a project's GHG emissions. These conditions may also include a reporting program in which the proponent would demonstrate progress towards implementing these mitigation measures and the plan for reaching net-zero emissions by 2050 for projects with a lifetime beyond 2050.

8. CLIMATE CHANGE IN THE POST-DECISION PHASE

If a decision is made that the project can proceed, the proponent must comply with any conditions in the Minister's decision statement. **These may include conditions** related to **GHG mitigation measures** and **follow-up program requirements**, including requirements to report progress in implementing these GHG mitigation measures and in implementing the plan for reaching net-zero emissions by 2050 for projects with a lifetime beyond 2050.

Proponents will submit information to IAAC to demonstrate they are in compliance with the conditions in the decision statement. IAAC will review the information, and may conduct on-site visits.

9. CONTACT INFORMATION

For any question on the strategic assessment of climate change, correspondence should be sent to:

Strategic Assessment of Climate Change
Environment and Climate Change Canada
351 St. Joseph Boulevard, 12th Floor
Gatineau, QC K1A 0H3
Email: ec.escc-sacc.ec@canada.ca

[14] For impact assessments conducted by the IAAC, the Minister is responsible for making the public interest determination or may refer the decision to the Governor in Council. For impact assessments conducted by a review panel, or an integrated review panel with a lifecycle regulator, the Governor in Council is responsible for making the public interest determination.

ANNEX I – USEFUL RESOURCES

- 2019 National Inventory Report 1990-2016: Greenhouse Gas Sources and Sinks in Canada: http://www.publications.gc.ca/site/eng/9.506002/publication.html
- Canada's Changing Climate Report: https://www.nrcan.gc.ca/environment/impacts-adaptation/19918
- Canadian Center for Climate Services: https://www.canada.ca/en/environment-climate-change/services/climate-change/canadian-centre-climate-services.html
- Climate Lens – General Guidance: https://www.infrastructure.gc.ca/pub/other-autre/cl-occ-eng.html
- Discussion Paper Developing a Strategic Assessment of Climate Change: https://www.strategicassessmentclimatechange.ca/5637/documents/11224
- Greenhouse gas projections: https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/projections.html
- Impact Assessment Regulations: https://www.canada.ca/en/impact-assessment-agency/corporate/acts-regulations/legislation-regulations.html
- Mid-Century Long-Term Low-Greenhouse Gas Development Strategy: http://publications.gc.ca/site/eng/9.825953/publication.html
- Pan-Canadian Framework on Clean Growth and Climate Change: https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html
- Pan-Canadian Greenhouse Gas Offsets Framework: https://www.ccme.ca/files/Resources/climate_change/Pan-Canadian%20GHG%20Offsets%20Framework%20EN%201.0%20secured.pdf
- Terms of Reference for conducting the Strategic Assessment of Climate Change: https://www.strategicassessmentclimatechange.ca/strategic-assessment-of-climate-change-terms-of-reference

ANNEX II – DEVELOPING THE STRATEGIC ASSESSMENT OF CLIMATE CHANGE

On July 19, 2018, ECCC published a discussion paper to seek views on the objectives and scope of the strategic assessment of climate change.[15] Comments received informed the development of the Terms of Reference and the draft strategic assessment of climate change. On March 11, 2019, ECCC published Terms of Reference that outlined the scope, process and timelines for conducting the strategic assessment of climate change.[16]

The strategic assessment of climate change has been developed under the authority of the *Department of the Environment Act*, adhering as closely as possible to the provisions in the IAA, including the obligations to:

- Take into account any scientific information and Indigenous knowledge provided;
- Make the information used available to the public; and
- Ensure the public is provided with an opportunity to participate meaningfully.

The Terms of Reference outlined the scope of the strategic assessment of climate change, and stated that it would provide guidance for:

1. Quantifying a project's GHG emissions, including the approach to estimating direct and upstream GHG emissions, and how avoided emissions, GHG offsets and carbon sinks could be factored into estimates of GHG emissions;
2. Considering climate change in the Planning Phase of a project review; and
3. Considering climate change in the Impact Assessment Phase of a project review.

ECCC engaged provinces, territories, industry stakeholders, environmental non-government organizations, and Indigenous peoples in developing the draft strategic assessment of climate change. ECCC has:

- convened three Provincial/Territorial working group meetings to provide information and seek feedback on the approach to the strategic assessment of climate change;
- held a multi-stakeholder meeting and compiled the results of this engagement to inform the approach; and
- invited Indigenous peoples that provided comment on the discussion paper to individual meetings.

The draft strategic assessment of climate change was published on August 8, 2019. In August 2019, ECCC organized webinars to present the document to stakeholders, respond to questions and receive feedback. Comments received in response to the draft strategic assessment of climate change were considered in the development of the strategic assessment of climate change.

Minister Wilkinson deemed the strategic assessment of climate change, published in July 2020, a strategic assessment conducted under section 95 of the *Impact Assessment Act*.

[15] Discussion paper Developing a Strategic Assessment of Climate Change

[16] Terms of Reference