Climate implications of policy assessment

GUIDE TO ESTIMATING THE GREENHOUSE GAS EMISSION IMPACTS OF POLICIES



Environment Manatū Mō Te Taiao

New Zealand Government

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1. Introduction

1.1 Purpose of this guide

The purpose of this guide is to support agencies in meeting the Climate Implications of Policy Assessment (CIPA) requirement, details of which can be found in section 1.2. This guide provides information on:

- 1. understanding the CIPA process
- 2. carrying out greenhouse gas emissions (GHG) analysis
- 3. using the CIPA Excel tool
- 4. answers to common questions.

This guide and supporting documents, including the Excel tool, can be found at https://www.mfe.govt.nz/climate-change/climate-implications-policy-assessment. For more information, please contact the Ministry for the Environment's CIPA team at cipa@mfe.govt.nz.

1.2 CIPA requirement

From 1 November 2019, central government agencies are required to undertake and report on a GHG emissions analysis, known as a CIPA, for all policy proposals that:

- will impact on New Zealand's GHG emissions
- will go to Cabinet
- meet certain qualifying criteria.

This requirement will apply where:

- an objective of the policy proposal is to decrease GHG emissions
- the impact on greenhouse gas emissions is likely to be equal or above 0.5 million tonnes of carbon dioxide equivalent (CO₂-e¹) within the first ten years of the proposal period
- for forestry-related proposals, the impact on greenhouse gas emissions is likely to be equal or above 3 million tonnes of CO₂-e within the first 30 years of the proposal period.

The above thresholds represent an annual average of 50,000 and 100,000 tonnes of CO_2 -e respectively, and have been lowered since the original threshold set in November 2019.

¹ Carbon dioxide equivalent is a way of consistently expressing the impact of different greenhouse gases in terms of the amount of carbon dioxide that would create the same amount of global warming.

The CIPA requirement:

- is limited to the direct GHG emission impacts of policies²
- focuses on New Zealand's GHG emissions
- includes assessment of GHG emission increases, decreases and sequestration³
- requires the key findings are reported in documentation provided to Ministers, and in the Cabinet paper.

1.4 Who should use this guide

This guide should be read when preparing policy proposals that will have impacts on New Zealand's GHG emissions, including when preparing:

- a) policy proposals for Ministers and Cabinet
- b) regulatory proposals that are subject to the Treasury's Regulatory Impact Assessment (RIA) regime.

This guidance, and the accompanying Excel tool, have been designed for central government agencies. However, this toolkit can be used by a wider set of stakeholders, such as local government, iwi, non-governmental organisations and community service providers.

1.5 Further information

This guide, and the accompanying CIPA Excel tool, are part of a suite of documents that relate to the measuring of GHG emissions. Other documents of use when considering the GHG emission impacts of policy proposals are outlined in table 1.

Table 1:	Guidance when considering GHG emise	sion impacts of policy proposals
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Name of document	Link
Measuring Emissions: A Guide for Organisations. 2019	https://www.mfe.govt.nz/climate-
Detailed Guide (Ministry for the Environment, 2019a)	change/guidance-measuring-emissions
New Zealand's Greenhouse Gas Inventory 1990–2018 (Ministry for the Environment, 2020)	https://www.mfe.govt.nz/publications/climate- change/new-zealands-greenhouse-gas- inventory-1990-2018
Emissions Tracker	https://emissionstracker.mfe.govt.nz
New Zealand's Third Biennial Report Under the United Nations	https://www.mfe.govt.nz/publications/climate-
Framework Convention on Climate Change (Ministry for the	change/new-zealands-third-biennial-report-
Environment, 2017a)	under-united-nations-framework
New Zealand's Seventh National Communication under the	https://www.mfe.govt.nz/publications/climate-
United Nations Framework Convention on Climate Change and	change/new-zealands-seventh-national-
the Kyoto Protocol (Ministry for the Environment, 2017b)	communication-under-united-nations

² See section 4.2 for further information on direct and indirect impacts.

³ Sequestration refers to the capture and long-term storage of carbon, associated with forests and other plant life. It is primarily considered for policy proposals that involve land use change.

⁶ Climate implications of policy assessment: guide to estimating the greenhouse gas emission impacts of policies

The Ministry for the Environment intends that this guide is used alongside wider Government guidance on estimating the impacts of policy proposals. Some examples are outlined in table 2.

Name of document	Link
CBAx Spreadsheet Model and CBAx	https://treasury.govt.nz/publications/guide/cbax-spreadsheet-model-0
Tool User Guidance	https://treasury.govt.nz/publications/guide/cbax-tool-user-guidance
Government Expectations for Good Regulatory Practice	https://treasury.govt.nz/publications/guide/government-expectations- good-regulatory-practice
RIA Quick Guide	https://treasury.govt.nz/publications/guide/ria-quick-guide
Guide to Social Cost Benefit Analysis	https://treasury.govt.nz/publications/guide/guide-social-cost-benefit- analysis
Guide to Cabinet's Impact Analysis Requirements	https://treasury.govt.nz/publications/guide/guide-cabinets-impact- analysis-requirements-html

Table 2: Guidance when carrying out impact analysis

1.6 Feedback and improvements

The Ministry for the Environment welcomes suggestions on the CIPA process and feedback on the usability of the Excel tool and guide. The Ministry will improve and update the Excel tool and guidance as we receive feedback and collect data on the information and outputs. Contact cipa@mfe.govt.nz for any comments and suggestions.

2. Understanding the Climate Implications of Policy Assessment process

This section explains the process for carrying out and reporting on the greenhouse gas (GHG) emission impacts of policy proposals under the Climate Implications of Policy Assessment (CIPA) requirement.



Complete the early engagement form. This is sent to the Ministry for the Environment to confirm whether the policy is/is not exempt from the assessment.

What are the impacts in scope of the assessment (ie, what are the direct impacts).

Can make use of the CIPA Excel tool or bespoke analysis.

The Ministry will contact you for further information, if required.

Reported on under the Climate Implications section of the Cabinet paper template.

Statement of quality assurance from the Ministry for the Environment.

CIPA disclosure sheet is annexed to the Cabinet paper.

2.1 Step 1: Identifying whether the CIPA requirement applies

Central government agencies who are developing policy proposals that will go to Cabinet should complete an early engagement form (see appendix 2).

The purpose of the early engagement form is to identify policy proposals that are subject to the CIPA requirement, and so should disclose the GHG emissions impacts. To do this, the early engagement form asks two questions:

- 1. whether a reduction in GHG emissions is an explicit objective of the policy proposal
- 2. whether the policy proposal is likely to have GHG emission impacts in one or more sectors that have been identified as being important for GHG emissions reductions.

Send the completed early engagement form to the Ministry for the Environment's CIPA team at cipa@mfe.govt.nz. The Ministry will then confirm whether the policy proposal is subject to, or exempt from, carrying out and reporting on a GHG emissions analysis under the CIPA requirement. Agencies may be required to provide more information on the proposal before a decision can be made.

The Ministry for the Environment's CIPA team will endeavour to return these forms as soon as possible. This should be within five working days.

2.1.1 GHG emissions reductions an explicit objective of the proposal

If an explicit objective of the policy is a reduction in GHG emissions, the CIPA requirement to carry out and report on a GHG emissions analysis applies in full.

2.1.2 GHG emissions reduction not an explicit objective of the proposal

For policy proposals where a reduction in GHG emissions is not an explicit objective, the Ministry for the Environment will determine whether the likely GHG emission impacts meet the appropriate threshold for significance. This threshold has been set as an increase or decrease in carbon dioxide equivalent of 0.5 million tonnes over the first ten years of the proposal period (representing an annual average of 50,000 tonnes), or 3 million tonnes over 30 years for forestry related proposals (representing an annual average of 100,000 tonnes).

To assess whether the GHG emissions threshold is likely to apply, the Ministry for the Environment's CIPA team will consider the information provided in the early engagement form.

The CIPA team will then be in contact for more information if necessary. For example, if they identify from the engagement form that a policy proposal will have an impact in the waste sector, then further analysis may be appropriate to determine whether that impact is projected to be above the threshold.

If the CIPA team determine that the GHG emissions threshold is met, the CIPA requirement to carry out and report on a GHG emissions analysis applies in full. If they determine that a CIPA is not required, agencies can still voluntarily complete and report on their GHG emissions analysis.

2.2 Step 2: Carrying out a GHG emissions analysis

2.2.1 Scope of analysis

In completing the GHG emissions assessment, analysis of the GHG emission impacts should be carried out for the preferred policy option(s) (both the agency's and the Minister's, should they differ). It is optional to complete a GHG emissions assessment for other options considered.

For Cabinet papers that present a range of options (for example, for the purposes of a consultation document), the GHG emissions analysis may be presented at a high level. The Ministry for the Environment expects that a more detailed analysis will be completed once the range of options has been narrowed to a preferred option(s).

2.2.2 Direct and indirect impacts

The CIPA requires reporting on the direct GHG emission impacts of policy proposals. At a minimum, the assessment must include consideration of these impacts in the CIPA analysis. It is optional whether the assessment also considers indirect GHG emission impacts.

More advice on carrying out GHG emissions analysis, including a discussion of direct and indirect impacts, can be found in section 4.2.

2.2.3 Embodied emissions

The CIPA requirement refers to GHG emissions generated in New Zealand, so the direct GHG emissions from imported goods should not be included. This is most likely to be relevant for materials imported for manufacture, such as steel, aluminium, etc.

2.2.4 Main GHG emitting sectors

Analysis of the GHG emission impacts of policy proposals should consider the impacts on the following sectors:

- electricity
- transport
- waste
- agriculture
- industry (including industrial process heat and emissions from the creation of materials; eg, steel/aluminium)
- land-use change and forestry.

The CIPA requirement only applies to the GHG emissions identified and defined in New Zealand's Greenhouse Gas Inventory. This covers carbon dioxide, methane, nitrous oxide and fluorinated gases.

2.2.5 Timescales for analysis

The Climate Change Response (Zero Carbon) Amendment Act sets in statute a GHG emissions reduction target for 2050. A series of five-year GHG emissions budgets will act as stepping stones to reach that target.

The Climate Change Commission will advise on the first three of these budgets in 2021, covering 2022–25, 2026–30 and 2031–35.

As a minimum the CIPA disclosure should report on the GHG emission impacts of policy proposals to 2035, to align with the first three GHG emission budgets on which Government will receive advice.

Where possible the CIPA should also report on the GHG emission impacts for the 2036–40, 2041–45 and 2046–2050 GHG emission budget periods (acknowledging that the Government will not have yet received advice on what these budgets should be), to align with the GHG emissions reduction target for 2050.

Time period	Report on GHG emission impacts?
2020–25	Yes
2026–30	Yes
2031–35	Yes
2036–40	Where possible
2041–45	Where possible
2046–50	Where possible

Table 3: Timescales for reporting GHG emission impacts

2.3 Step 3: Reporting and disclosing the CIPA

If subject to the CIPA requirement, a summary of the GHG emission impacts of a policy proposal should be given under the heading Climate Implications in the Cabinet policy paper template.

The GHG emission impacts of the policy proposal should also be reported using the CIPA disclosure sheet (see appendix 3), and appended to the relevant Cabinet paper.

The CIPA disclosure sheet reports on the GHG emissions impacts of the policy proposal for each of the time periods outlined in section 2.2.4 for the main emitting sectors. If GHG emission impacts are not expected in a certain period, outline why.

The CIPA disclosure sheet also reports an annual average figure. This allows for the fact that, for some policy proposals, there will be an adjustment period before the GHG emissions impacts are realised.

The CIPA disclosure sheet also allows the inclusion of additional information, for example:

- sensitivity analysis
- carbon leakage
- where differing assumptions have been used than those included in the CIPA Excel tool
- any important limitations or uncertainties underlying the analysis.

2.3.1 CIPA disclosure cannot be completed at time of proposal going to Cabinet

For those submissions that have missing or inadequate CIPA disclosures, the Ministry for the Environment may advise the Minister for Climate Change and the Chair of the relevant Cabinet Committee. If the submission proceeds to Cabinet discussion, the submission should acknowledge the deficiency and include a commitment on when a robust CIPA will be provided to Cabinet.

Where applicable, it may be appropriate to seek this as part of a Supplementary Analysis Report, provided in accordance with Cabinet's Impact Analysis requirement. If the submission does not address these issues, the responsible Minister and the Minister for Climate Change will jointly determine when and to whom the completed CIPA will be provided, on advice from officials.

2.3.2 Quality assurance

If the CIPA requirement applies, the Ministry for the Environment will include a statement on the quality of the analysis of GHG emissions impacts, to be included in the Cabinet paper.

When quality assuring the CIPA disclosure, the Ministry for the Environment will assess:

- whether relevant sources of GHG emissions (activity data) have been reliably identified
- how robust the estimates for the activity data are, and the basis for these estimates
- any key assumptions or projections that have been flagged to the Ministry through the assessment process.

Agencies should complete the assessment to the best level possible. The Ministry for the Environment will follow up if additional information is required.

3. Climate Implications of Policy Assessment and other Government processes

3.1 Climate Implications of Policy Assessment and Treasury's Regulatory Impact Assessment regime

For regulatory proposals, Climate Implications of Policy Assessment (CIPA) represents an additional, complementary requirement to RIA requirements administered by Treasury's Regulatory Quality Team.

For regulatory proposals, the CIPA early engagement questions are included in the Regulatory Impact Assessment (RIA) process confirmation form. The completed form should be sent to both the Treasury and the Ministry for the Environment CIPA team at cipa@mfe.govt.nz. This will help reduce the risk of different document versions being sent to agencies, and the Ministry for the Environment and the Treasury making inconsistent process decisions.

In terms of quality assurance, the Treasury will invite the Ministry for the Environment to join Treasury's quality assurance panel for the regulatory impact statement whenever the Ministry determines that a CIPA is required (and where Treasury is carrying out the quality assurance for the regulatory impact statement). This will give the benefits of sharing information and expertise, improving consistency in quality assurance, and mean agencies receive complete feedback from a single source.

The Ministry for the Environment will retain sole authority over CIPA quality assurance and the quality assurance statement.

In terms of outputs, the CIPA disclosure will be integrated into the regulatory impact statement that accompanies the Cabinet paper. This is in addition to the separate CIPA disclosure sheet.

4. Carrying out greenhouse gas emissions analysis

4.1 Carrying out greenhouse gas emissions analysis

4.1.1 Logic model for carrying out emissions analysis

There are four steps in the Climate Implications of Policy Assessment (CIPA) process for carrying out greenhouse gas emissions (GHG) analysis.





4.1.2 Step 1: Identifying the GHG emissions counterfactual

The first step in carrying out GHG emissions analysis is to identify the appropriate GHG emissions baseline. This requires considering what would happen if the policy or project was not carried out. This default course of action is known as the "do nothing new" option. It provides the base case, or counterfactual.

In defining a GHG emissions baseline, consider:

- What will, or is likely to, happen without the proposed policy?
- What would the GHG emissions be without the proposed action?

The GHG emission impacts of each option should be considered relative to their counterfactual. It is important to carefully consider the most appropriate counterfactual,

as it could significantly change the projected impact of a proposal. If the counterfactual is uncertain, this should be highlighted, and impacts of varying the counterfactual should be explained.

Some Government agencies will have pre-agreed GHG emissions baselines. If appropriate, in the first instance seek advice from the relevant GHG emission reporting teams, to gain advice on the appropriate GHG emissions baseline to use.

4.1.3 Step 2: Identifying policy overlaps

It is important to consider whether other policies may have overlapping impacts when assessing the GHG emission impacts of policy proposals. For example, a policy proposal that increases the uptake of insulation in homes may have overlapping GHG emission impacts with a policy proposal that encourages fuel switching to low-emission alternatives for home heating.

In identifying policy overlaps, consider:

- 1. Would some of the identified impacts of this policy already be accounted for (overlaps)?
- 2. Could an existing policy increase the success of the intervention (complementary policies)?

4.1.4 Step 3: Identify changes in activity data

To carry out GHG emissions analysis, identify the activity data that will have an impact on emissions. For example:

- For policies that encourage an uptake of electric vehicles, the activity data could include:
 - a reduction in internal combustion engines (ICEs)
 - an increase in electric vehicles, and thus electricity demand.
- For policies that encourage the adoption of energy efficiency measures (for example, more energy efficient appliances), the activity data could include a reduction in electricity demand.
- For policies that deter the movement of waste to landfill, potential activity data will likely be a decrease in the amount of waste to landfill.
- For policies that encourage fuel switching from fossil fuels to electricity for example for industrial process heat activity data could include:
 - a reduction in fossil fuel use
 - an increase in electricity demanded.

4.1.5 Step 4: Applying a GHG emissions factor

Once the activity data has been identified, an appropriate GHG emissions factor is applied to estimate the change in GHG emissions. The Ministry for the Environment recommends using

the GHG emission factors from *Measuring Emissions: A Guide for Organisations*,⁴ which have been integrated into the CIPA Excel tool.

The exception to this is the GHG emission factors associated with afforestation and deforestation, for which bespoke emissions factors have been developed. For more information on the GHG emission factors in the CIPA Excel tool, see section 5.2.

If there is no appropriate GHG emissions factor, contact the Ministry for the Environment's CIPA team at cipa@mfe.govt.nz for support.

4.2 Direct and indirect impacts

4.2.1 Direct impacts

The CIPA requirement only applies to the direct impacts on GHG emissions of policy proposals. There is no clear consensus on the definition of direct and indirect GHG emission impacts internationally. For the purposes of the CIPA requirement, the Ministry for the Environment has defined direct impacts as those impacts that flow reasonably automatically from the implementation of the proposed policy or decision.

Direct GHG emission impacts can be further categorised as:

- 1. Embodied GHG emission impacts. These are the GHG emissions associated with the consumption of materials in the production process. For example, in the construction of infrastructure, embodied emissions are from manufacturing and use of materials, such as steel and cement.
- 2. Operational GHG emissions. These are the GHG emissions associated with the ongoing operation of a policy or investment proposal. For example, for the creation of new infrastructure, operational emissions span the design life of the building and include appliances such as heating and cooling (ie, air conditioners, hot water systems, refrigeration and lighting).
- GHG emissions associated with the rebound effect. Proposals that improve energy
 efficiency (such as heating or lighting policies or projects) have the effect of reducing the
 overall amount of energy used. An immediate result will be a reduction in energy bills.
 This frees up funds that can be spent on energy or other goods and services.

For the purposes of the CIPA requirement, the Ministry for the Environment has defined rebound effects only in relation to changes in energy demand (both electricity and transport fuels). They will therefore be most relevant to proposals that are put forward by the Ministry for Business, Innovation and Employment, Ministry of Transport, the Energy Efficiency and Conservation Authority, and the New Zealand Transport Agency.

⁴ Ministry for the Environment, 2019a.

4.2.2 Indirect impacts

The CIPA disclosure may include an assessment of the indirect GHG emission impacts of a policy proposal. These GHG emission impacts are less attributable to the policy proposal, but may occur over a longer timeframe as a result of the policy.

Indirect impacts often include:

- long-term behavioural changes
- technological changes.

Given the high amounts of uncertainty in estimating the indirect GHG emission impacts of policy proposals, it is not included as a requirement at this stage of the CIPA disclosure. However, if you feel that consideration of relevant indirect impacts may be beneficial for your analysis, contact the Ministry for the Environment's CIPA team at cipa@mfe.govt.nz.

4.3 Sensitivity analysis

There will be a level of uncertainty in the expected changes in activity data, particularly in relation to future impacts of policy proposals. There may also be uncertainty around the appropriate base case or counterfactual. It is optional, but encouraged, to carry out a sensitivity analysis around the CIPA results and present this appropriately. For example, for policy proposals with a high level of uncertainty, it may be appropriate to present the results in terms of low, central and high scenarios.

4.4 Examples

4.4.1 Research and development

Policy proposals that encourage the development of lower-emitting technologies will have an impact on GHG emissions. For example, the decision to create a new research and development (R&D) fund may lead to increased innovation that help to develop new, loweremitting technologies. However, it would be very challenging to attribute the development of these technologies to the decision to create a new R&D fund. The new technologies may be developed many years after the creation of the fund, and may have resulted from the cumulative impact of several technological advances, innovations and knowledge spill-overs.

It is likely that the bulk of the GHG emission impacts would be classified as indirect, and are not currently in scope of the CIPA requirement. However, if you would like to consider these in your GHG emission analysis it is optional to do so. Please contact the Ministry for the Environment's CIPA team for support at cipa@mfe.govt.nz.

4.4.2 Low-to-high density urban development

The impact of moving from low- to high-density urban development on GHG emissions will depend on the exact nature of the change. As a minimum, consider the GHG emissions associated with:

a) the construction of new infrastructure

- b) land conversion
- c) increases and decreases in transport times (for example due to agglomeration of services into one area)
- d) changes in mode of transport (for example through increased cycleways or improved public transport)
- e) end-of-life disposal of materials.

For example, a decision to increase urban density could result in decreased GHG emissions as people travel smaller distances to work/businesses/schools. This is a direct impact on emissions.

However, this could also lead to a decrease in fuel bills as distances travelled are shorter. This frees up funds that some households may choose to use by travelling more frequently by car, when previously they would have taken other modes of transport. This is known as a rebound impact.

4.4.3 Transport mode shift

A transport shift from fuel-powered vehicles to public transport and other types of lowemissions transport would be associated with:

- 1. a decrease in emissions associated with a decrease in the use of fossil fuels
- 2. an increase in emissions associated with increased electricity demand, as uptake of electric vehicles increases.

4.4.4 Fuel switching for the purposes of industrial process heat

For policies that encourage fuel switching for the purpose of industrial process heat, for example from coal and gas to electricity or biomass, there may be changes in GHG emissions associated with:

- 1. a reduction in fossil fuel use
- 2. an increase in electricity demanded; or an increase in the amount of biomass being used.

5. Using the Climate Implications of Policy Assessment Excel tool

5.1 Introduction to the Climate Implications of Policy Assessment Excel tool

To support the completion of fit-for-purpose greenhouse gas (GHG) emissions analysis, the Ministry for the Environment has developed the Climate Implications of Policy Assessment (CIPA) Excel tool to estimate the emission impacts of potential policy proposals.

The CIPA Excel tool will assist agencies to calculate GHG emissions, by gas, and measured in kilograms of carbon dioxide equivalent.

The Excel tool uses a set of standard assumptions around emission factors to develop high quality, consistent analyses across government. These assumptions are listed in the calculation Excel tool itself.

For ease of use, the CIPA Excel tool is split into separate guidance for each of the six main emitting sectors, according to reported emissions in New Zealand's Greenhouse Gas Inventory. The emission factors are also recorded in the Excel tool itself. It is likely that some policy interventions will have impacts across multiple sectors.

The Excel tool calculates the emission impacts from changes to sectors (for example, an increase or decrease in energy consumption, or waste to landfill) into changes in GHG emissions.

Government agencies are expected to make use of the CIPA Excel tool to undertake their GHG emission analysis, unless the agency chooses to use a more comprehensive or bespoke model. It is expected that agencies will carry out the GHG emissions analysis to the level of the CIPA Excel tool at a minimum.

Although designed for central government, this Excel tool can be used by local government, iwi, non-governmental organisations and community service providers.

5.1.1 No clear activity data

GHG emission modelling is one part of the cost benefit analysis process. The CIPA Excel tool supplements well-researched quality policy advice, and relies on understanding the impact your policy will have in application.

If there are information gaps that are irreconcilable in your analysis, supplement the information that is required where practicable, and disclose this to the CIPA team.

5.2 How to use the CIPA Excel tool

Start in the tab titled "Summary sheet". This provides an opportunity to record the policy proposal, including start date and end date for GHG emission impacts. This tab also includes a summary table for impacts, which draws on the input calculations from each of the separate sector tabs.

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Open the "Identifying affected sectors" tab. This tab identifies the emissions sectors likely to be impacted by the policy proposal. The questions mirror the CIPA early engagement form. Answering the questions in the tab will signpost you to the relevant sector tabs.

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10 11	 Is this proposal likely to result in a change in demand for transport fuels? e.g. fuel switching from oil to biomass, electrification of transport 	If yes, please go to "Transport - residential" and "Transport -				
12 13 14	 Is this proposal likely to result in a change in the amount of waste going to landfill? e.g. encouraging behaviour change, changed charges for waste disposed of at landfill 	if yes, please go to "Waste"				
16 17	 Is this proposal likely to result in a change in agricultural practices? e.g. a reduction in the use of nitrogen fertiliser, a reduction in the numbers of ruminant 	If yes, please go to "Agriculture"				
18 19 20	 Is this proposal likely to result in a change to industry and processing practices? e.g. the electrification of process heat, construction of new roads / buildings 	If yes, please go to "industry"				
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5.2.1 Sector tabs

The CIPA Excel tool includes tabs for each of the listed sectors. Each sector tab provides space for inputting the most common activity data for each of the sectors. Once this activity data is input to the Excel tool, it will automatically assign the appropriate emissions factor and calculate the emissions reductions or increases. In addition, this information will be automatically pulled into the summary table on the "Summary sheet" tab.

Electricity

The "Electricity" tab in the CIPA Excel tool allows for estimating the changes in GHG emissions associated with a change in electricity demand; for example, a reduction in electricity demand might be associated with energy efficiency measures. The change in electricity demand in kilowatt hours per year should be included in the Excel tool. It will then be converted to kilograms of carbon dioxide equivalent.

Other electricity demand side-drivers may also be considered, such as Distributed Energy Resources, solar photovoltaic (PV), distributed generation, electric vehicles and batteries.

The Excel tool also allows for estimating the increase in electricity demand associated with an increase in the uptake of electricity vehicles, including electric buses. You can choose to provide an estimate of this based on the fleet year of the vehicle, if this is known.



Electricity emission factors

Electricity emissions factors are critical, particularly during peak electricity demand periods. Higher peak demand means higher emissions from the electricity system, as the renewable electricity supply only goes so far. However, assessing an emissions factor for electricity use is more complex than for other energy sources. For electricity, the complexity of the system, the range of generation sources in use, and the time-varying nature of demand and supply all combine to make the emissions factor less straightforward. The CIPA Excel tool takes the average emissions approach for estimating electricity emission factors assumptions. This takes all of the electricity emissions in a given period (usually a year) and divides them by the total electricity demand in that period. The average emissions approach is a useful one for assessing overall emissions from existing demand, as the sum of emissions for different uses will add to the total for the sector.

An alternative approach is to use 'marginal emissions'. This looks at the effect on emissions of changing demand (up or down). For example, if we estimate that implementing a programme will result in a demand reduction of 50 GWh, we can model the electricity system and determine the likely change in emissions.

In general the marginal demand in New Zealand at present is supplied by a mixture of highand low-efficiency gas generation, and coal or gas generation from Huntly. Statistically, the marginal demand is supplied 'almost always' by combined-cycle gas turbine generation; it is 'occasionally' (for example during dry periods) by open-cycle gas turbines, diesel or Huntly 'rankine' units with higher emissions factors.

The marginal demand approach may be more appropriate for policies with significant impacts on electricity demand, in which case a bespoke analysis may be undertaken.

Transport – residential

The *Transport – residential* tab in the CIPA Excel tool allows for estimation of the impact on GHG emissions associated with changes in the light vehicle fleet. Agencies can choose to estimate these impacts based on the type of vehicle, and fleet age (if these are known). An average or more general category can be used for when the size of vehicle is uncertain. The changes in kilometres for each of the applicable vehicle fleet types should be included in the Excel tool. The CIPA Excel tool will automatically estimate the GHG impacts in terms of kilograms of carbon dioxide equivalent.

The Excel tool also allows for estimating the change in GHG emissions associated with a change in the number of domestic flights taken.

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Transport – freight

The *Transport – freight* tab in the CIPA Excel tool allows for estimating changes in GHG emissions associated with a change in the number of kilometres driven for road, air and coastal freight. For example, this tab could be used to estimate the impact of GHG emissions of a proposal that limited the amount or type of freight. Input the changes in kilometres for each of the applicable freight types; the CIPA Excel tool will automatically estimate the GHG impacts in terms of kilograms of carbon dioxide equivalent.



Waste

The *Waste* tab in the CIPA Excel tool estimates changes in GHG emissions associated with a change in the amount of waste going to landfill. There is the option to choose to include gas recovery.

GHG emissions can be estimated based on the type of waste (if this is known). The changes in kilograms for each of the waste types should be input into the Excel tool (use the general waste line if this is not known). It will automatically estimate the GHG impacts in terms of kilograms of carbon dioxide equivalent.

The *Waste* tab also allows for estimating changes in GHG emissions associated with a change in the amount of compost.

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Agriculture

The *Agriculture* tab in the CIPA Excel tool allows for estimating changes in GHG emissions associated with changes in the number of ruminants (dairy, non-dairy cattle, sheep and lamb, and deer). Changes in the number of ruminants should be included in the Excel tool and it will automatically estimate the GHG impacts in terms of kilograms of carbon dioxide equivalent and methane.

This tab aids in estimating the GHG of relatively minor changes in agriculture. For more significant changes, agencies should contact the Ministry for Primary Industries. The Ministry for the Environment CIPA team can help facilitate these discussions.

The Excel tool also allows for estimating of changes in GHG emissions associated with a change in fertiliser, for a number of fertiliser types. The tool will automatically estimate the GHG impacts in terms of kilograms of carbon dioxide equivalent, and of nitrous oxide.

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Industry

The *Industry* tab supports estimating of GHG emissions associated with construction materials, such as steel and cement. The amount of construction materials used should be input into the Excel tool in kilograms. The tool will then estimate the GHG impacts in terms of kilograms of carbon dioxide equivalent.

The *Industry* tab also allows for estimating GHG emissions from switching fossil fuels to loweremitting alternatives (electricity and biomass) commonly associated with industrial heat. In this case, input the reduction in the fuel source being replaced.

In the case of switching to biomass, include the increase in the use of biomass in the *Industry* tab. In the case of switching to electricity, input the increase in electricity demand in the *Electricity* tab.



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Land use change

The *Land use* tab in the CIPA Excel tool estimates the GHG emissions differently to the other sector tabs. The GHG emissions associated with changes in forestry, both afforestation and deforestation, are very complex, particularly due to their interactions with the New Zealand Emissions Trading Scheme.

The purpose of this tab is to aid in estimating the GHG emissions of relatively minor changes in forestry. For more significant changes, agencies should contact the Ministry for Primary Industries, the land-use and carbon analysis system (LUCAS) team at the Ministry for the Environment or Te Uru Rākau (the operational policy – forest incentives team) at the Ministry for Primary Industries. Contact the Ministry for the Environment's CIPA team to help facilitate these discussions.

For proposals that increase forestry planted, the summary table on the *Summary sheet* tab records this separately under the Sequestration heading.

The Land use change tab makes use of high-level summarising assumptions for estimating the appropriate emission factors, based on New Zealand's Greenhouse Gas Inventory. Contact the Ministry for the Environment for assistance calculating the impact of other forms of land use change affecting emissions, such as an increase or decrease in wetlands or other types of vegetation.

Afforestation

Afforestation estimates the net emissions in carbon dioxide of converting land of other types into forest land. The change in soil carbon and biomass losses, which occur from the removal of the vegetation of the previous land use, are calculated as the weighted average of all the land uses that had been converted to forest land (planted or natural) from 1990 to 2017.

Planted forest

- The emission factors for afforestation of planted forest are based on the long-term average carbon stock for afforestation gains. This makes use of the post-1989 forest yield table until it reaches 209.4 tonnes C (around age 22). It assumes the species is pinus radiata, with a rotation of 28 years, and includes harvested wood products. The soil losses/gains are included in this figure.
- Biomass losses are derived from the national inventory report and occur within the year of conversion.

Natural forest

- The emission factors for afforestation of natural forest are based on the long-term average carbon stock for afforestation gains; this uses the post-1989 forest yield table.
- Soil losses on conversion are derived from the national inventory report.
- Biomass losses are derived from the national inventory report and occur within the year of conversion.

Deforestation

Deforestation estimates the net emissions in carbon dioxide from converting forest land into other types of land use (for example into grassland, wetland or settlements).

The change in soil carbon, and biomass losses, which occur from the addition of the vegetation in conversion to a new land use, are calculated as the weighted average of all the land uses converted from forest land (planted or natural) from 1990 to 2017.

Planted forest deforestation

- The emission factors use an average of the post-1989 and pre-1990 planted forest yield tables at 28 years old. All carbon biomass is assumed to be instantly emitted.
- Soil losses on conversion are derived from the national inventory report.
- Biomass losses are derived from the national inventory report and occur within the year of conversion.

Natural forest deforestation

- The GHG emission factors use an average of the natural forest stocks from the latest report. All carbon biomass is assumed to be instantly emitted.
- Soil losses on conversion are derived from the national inventory report.
- Biomass losses are derived from the national inventory report and occur within the year of conversion.

5.3 Emission factors

Emission factors are provided in kilograms of carbon dioxide equivalent (CO_2e) and, where possible, the breakdown by carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) (in carbon dioxide equivalent) has also been provided. Emission factors are provided for these gases per unit as specified in the tables, for example:

Emission source		kg CO₂	e/unit	kg CH₄/unit		
Regular petrol	Litre	2.45	2.35	0.0276	0.0797	

The emission factors are taken from *Measuring emissions: A guide for organisations* (Ministry for the Environment, 2019a). The exception to this are the emission factors used for land use, land-use change and forestry (LULUCF), which use bespoke GHG emission factors based on New Zealand's Greenhouse Gas Inventory.

5.3.1 Global warming potentials

All emission factors in the guide are expressed in units of carbon dioxide equivalent (CO₂e), which is in line with the GHG Protocol. The Global Warming Potentials (GWPs) used are those from the *Fourth Assessment Report* (Intergovernmental Panel on Climate Change, 2007). The use of these values is in line with the United Nations Framework Convention on Climate Change (UNFCCC), to which the New Zealand National Inventory Report is submitted.

Greenhouse gas	CO2	CH₄	N₂O
Global warming potentials	1	25	298

5.4 Approach taken

The approach taken for estimating greenhouse gas emissions in this Excel tool is:

 $E = Q \times F$

Where:

- E = emissions from the emission source in kilograms of carbon dioxide equivalent per year
- Q = activity data; eg, quantity of fuel used
- F = emission factor for emissions source.

This formula applies to both the calculation of carbon dioxide equivalent emissions and individual carbon dioxide, methane and nitrous oxide emissions, with the appropriate emission factors applied for F.

The preferred form of data is in the units expressed in the emission factor tables, which result in the most accurate emission calculation. If the data cannot be collected in this unit then appropriate conversion factors should be used.

5.5 Limitations of the CIPA Excel tool

To be able to use the CIPA Excel tool, agencies need to quantify changes in activity data. There will be gaps in the evidence for the impacts of initiative proposal, for example how effective an initiative might be when trying something new.

CIPA modelling is just one part of cost benefit analysis (CBA) and policy analysis, and supplements well-researched quality policy advice. Agencies will need to do a thorough policy analysis when conducting a CBA to help inform their CIPA assessment. This requires research, so that options are informed by evidence.

There are likely to be uncertainties in the outputs, as the analysis relies on information and judgements on assumptions. With this in mind, agencies will need to make judgements based on the best available evidence, and what is a reasonable and fit-for-purpose analysis for the proposal. For example, agencies will make judgements about the policy and intervention options (such as what options are feasible), the counterfactual, and the impact assumptions.

5.5.1 Assumptions

The purpose of the Excel tool is not to deliver a judgement on what the assumptions should be. Instead, it is about making these assumptions transparent. This allows discussions and advice about GHG emission impacts to be better informed, and enables more rounded and robust analysis in the future.

Developing policy advice is inherently uncertain, as it requires advising on changes that may occur in the future. It is important to develop practical advice, based on the information available. The assumptions require clarity. The CIPA Excel tool can help with this assessment

by providing a consistent approach and standardised measurement for the projected emissions impacts.

Appendix 1: Answers to common questions

Questions and support

If there are further questions on the Excel tool, guidance or process, the Climate Implications of Policy Assessment (CIPA) team at the Ministry for the Environment is available to help in your assessment if necessary.

If the Excel tool is not working, or the output seems to be consistently incorrect, please contact the CIPA team at cipa@mfe.govt.nz for advice.

What if there is no appropriate emissions factor in the CIPA Excel tool?

We recommend using the Ministry for the Environment's greenhouse gas (GHG) emissions factors. The most common GHG emission factors are listed in the tool itself.

For other emission factors, please refer to the documents for the *Measuring Emissions: A Guide for Organisations. 2019 Detailed Guide* (Ministry for the Environment, 2019a), which provides a comprehensive list of emission factors.

If an agency is still uncertain as to an appropriate emissions factor relevant for the analysis, please contact the Ministry for the Environment's CIPA team.

What if I want to use a different emissions model or assumptions?

Agencies are expected, as a minimum, to make use of the CIPA Excel tool to undertake their GHG emission analysis, unless the agency has a comprehensive in-house or bespoke model. It is expected that agencies will carry out the GHG emissions analysis to the level of the CIPA Excel tool, at a minimum.

Where agencies have used an in-house model and not the CIPA Excel tool, please make note of this in your email to the Ministry for the Environment.

What if the information is uncertain, or there isn't enough?

To be able to use the CIPA Excel tool, agencies need to quantify impacts on activity data. This is done through thorough policy impact analysis, which will help inform the CIPA disclosure sheet.

This requires research, so that options are informed by evidence. Agencies will need to make judgements based on the best available evidence and what is reasonable and fit-for-purpose analysis for the proposal.

For example, agencies will make judgements about the policy intervention options (such as what options are feasible), the counterfactual and impact assumptions. Developing

policy options are inherently uncertain, as it requires advising on changes that may occur in the future.

The CIPA Excel tool helps overall policy assessment by providing a consistent approach and standardised measurement for GHG emissions impacts of policy proposals.

What if there are impacts across different sectors?

The reporting template allows agencies to report on GHG emissions impacts in more than one sector. Agencies should ensure that all changes in GHG emissions take into account the interactions that policies and projects in one sector can have on other sectors. For instance, planning decisions may impact on transport emissions, as well as GHG emissions in buildings through GHG-embodied emissions in construction, and GHG emissions arising from energy use in buildings.

The impacts of policies or projects might also overlap or reinforce each other, impacting their combined effectiveness. The analysis should account for any interaction. For example, the savings from a new, efficient boiler will be lower in a house that already has cavity wall insulation.

Do I need to report on carbon leakage?

Carbon leakage occurs where, if for reasons related to the cost of climate policies, businesses transfer production to other countries with laxer emissions constraints. This could lead to an increase in their total emissions. The risk of carbon leakage may be higher in certain energy-intensive industries.

The CIPA Excel tool does not quantify carbon leakage, due to the difficulty in calculating GHG emissions elsewhere. Agencies can choose to report on the likelihood or risk of carbon leakage in the CIPA disclosure sheet.

Appendix 2: Climate Implications of Policy Assessment: early engagement form

Background

The Climate Implications of Policy Assessment (CIPA) is a requirement on central government agencies to carry out and report on the greenhouse gas (GHG) emission impacts of policy proposals that go to Cabinet. The requirement applies for policy proposals where:

- reductions in greenhouse gas emissions is an explicit objective of the proposal
- the impact on greenhouse gas emissions is likely to be equal or above 0.5 million tonnes CO₂-e within the first ten years of the proposal period (representing an annual average of 50,000 tonnes)
- for forestry-related proposals, the impact on greenhouse gas emissions is likely to be equal or above 3 million tonnes of CO₂-e within the first 30 years of the proposal period (representing an annual average of 100,000 tonnes).

More information on the requirement can be found in *Climate Implications of Policy Assessment: Guide to disclosing the greenhouse gas emission impacts of policies* (2019), which can be accessed from www.mfe.govt.nz/climate-change/climate-implications-policyassessment.

Compliance with this requirement is supported by the CIPA team at the Ministry for the Environment.

Purpose of this form

The purpose of this early engagement form is to support policy officials considering whether a climate implications of policy assessment needs to be completed.

Instructions for completing the form

Please answer the questions below.

If you answer yes to any of the questions, please email a completed copy of this form to cipa@mfe.govt.nz with a brief explanation of what the policy is. The Ministry for the Environment will respond with further information as to whether the policy is subject to further analysis through the CIPA requirement.

If you are unsure how to fill in the form, please contact the Ministry for the Environment at cipa@mfe.govt.nz.

Regulatory proposals

For regulatory proposals that are going through Treasury's Regulatory Impact Assessment (RIA) regime, the following questions form part of the RIA Exemption form, and will go to the Treasury and the Ministry for the Environment as part of this analysis. You do not need to send a separate form to the CIPA team at the Ministry for the Environment.

Key questions

	Yes/no/unsure	Comment if needed
Is a reduction in greenhouse gas emissions an explicit objective of the proposal?		
Could any of the policy options considered have a significant impact on greenhouse gas		
emissions (increases or decreases) in the following sectors?:		
Electricity, for example, policies that have an impact on:		
 renewable sources to replace fossil fuels in electricity generation 		
• a change in the amount of electricity demanded, for example the building of a factory		
 the electrification of process heat⁵ 		
 geothermal carbon capture and storage 		
 energy efficiency of buildings. 		
Transport, for example, policies that have an impact on:		
total vehicle kilometres travelled by internal combustion engine vehicles (including		
public transport)		
 fuel switching from fossil fuels to lower emission alternatives, such as electricity 		
(battery), hydrogen and biofuels		
 transport mode change (passenger and freight) 		
electric vehicle uptake.		
Waste, for example:		
 policies that will result in an increase or decrease in waste going to landfill. 		
Agriculture, for example, policies that have an impact on:		
 amounts and types of livestock on farms 		
 use of nitrogen fertiliser. 		
Land use, for example, policies that have an impact on:		
 amount of land converted to or from forest land 		
regenerating native forest		
changes in forest type or species.		
Industrial processes and product use, for example, policies that have an impact on		
 use of greenhouse gas emitting process heat fuels and fuel switching to biomass 		
energy efficiency in process heat		
the use of construction materials.		

Note: the listed examples are not an exhaustive list of all sources or activities associated with GHG emissions and are provided as indicative examples.

⁵ Process heat is energy that is primarily used for warming spaces and industrial processes, often in the form of steam, hot water or hot gases.

Appendix 3: Climate Implications of Policy Assessment: Disclosure Sheet

This disclosure sheet provides the responsible department's best estimate of the greenhouse gas emissions impacts for New Zealand that would arise from the implementation of the policy proposal or option described below. It has been prepared to help inform Cabinet decisions about this policy. It is broken down by periods that align with New Zealand's future emissions budgets.

Section 1: General information

General information	
Name/title of policy proposal or policy option:	
Agency responsible for the Cabinet paper:	
Date finalised:	Assessments may need to be updated as the policy process progresses and/or there is better or new information. If there are multiple assessments under the same initiative title, they will be differentiated by date.
Short description of the policy proposal:	2–3 sentences max. If the proposal/option is covered in a regulatory impact statement (RIS), please also state "More information can be found in the following RIS [give the RIS title and date]"

Section 2: Greenhouse gas emission impacts

Sector & source	Changes in greenhouse gas emissions in tonnes of carbon dioxide equivalent (CO ₂ e)						
	2020–25	2026–30	2031–35	2036–40	2041–45	2046–50	Cumulative impact
Electricity							
Transport							
Industry							
Waste							
Agriculture							
Land use, land use change and forestry							
Total							

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Section 3: Additional information

Additional information

Include in this section additional information that may be relevant. For example, this could include more information on:

- Sensitivity analysis
- Where assumptions differ from those included in the CIPA Excel tool, and why
- The main driver(s) of emission volumes for each of the key sources of impact (eg, the projections are based on 230,000 affected households, average electricity savings of 3000 kWh per household per annum from 2025, partially offset by some increased electricity demand in 30 per cent of households).
- Carbon leakage
- Any important limitations or uncertainties underlying the analysis (eg, the projections do not allow for any emissions arising from the xyz manufacturing process, due to a lack of information. The number of affected households could vary between 180,000 and 250,000, depending on implementation decisions yet to be taken).
- Note: additional sections, tables and/or graphics may be added to this template disclosure sheet if appropriate (discuss this with the CIPA team)

Section 4: Quality assurance

Quality assurance

Include in this section the quality assurance statement from the Ministry for the Environment's Climate Implications of Policy Assessment (CIPA) team.

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