

Non-State and Subnational Action Guidance

Guidance for integrating the impact of non-state and subnational mitigation actions into national greenhouse gas projections, targets and planning

July 2018

How to define the assessment boundary

4. DEFINING ASSESSMENT BOUNDARY

This chapter provides guidance on defining the assessment boundary in terms of sectors, GHGs, actor groups, action types, and indirect emissions included in the analysis.

Checklist of key recommendations

- Specify which sectors and subsectors, actor groups, action types, greenhouse gases, and types of indirect emissions are included in the assessment

Non-state and subnational actions can encompass a very large number of actions and targets taken by businesses, cities, states and provinces across all sectors. Table 4.1 illustrates the variety of non-state and subnational action in the US as an example. Depending on their objectives, users should define the boundary of the assessment.

It is a *key recommendation* to specify which sectors and subsectors, actor groups, action types, greenhouse gases, and types of indirect emissions are included in the assessment. By specifying the parameters of the assessment boundary, users may undertake a comprehensive assessment that includes all categories of each parameter, or a targeted assessment which may focus on a specific sector or actor group for example.

In addition, for users who selected an objective that requires integration, they may want to decide at this stage if they will compare their results against a BAU or other scenario, or whether they have the capacity and technical support to integrate results into a global assessment model (see Chapter 9 for more on integration). Deciding at the start of the assessment what to compare against at the end, will inform the steps and calculations during the assessment.

Table 4.1: Examples of non-state and subnational action from the U.S.

States	Cities	Businesses
GHG Target/Cap		
GHG emission targets	Climate change goal formally adopted or in process	Internal carbon price
Carbon pricing		Science-based GHG reduction target
Renewable/CCS/Nuclear		
Renewable energy portfolio standards or goals	Committed to 100% renewable energy	Companies with renewable targets
Property Assessed Clean Energy		100% renewable energy target
Financial incentives for CCS		
Zero-emission credits for nuclear		
Energy efficiency		
Combined heat and power financing and incentives	Energy savings goal formally adopted or in process	Corporate energy efficiency improvements through Better Buildings Challenge
Energy efficiency resource standard or goals	Energy efficiency procurement policy	Industrial EE improvements through Better Plants Program
Most recent building energy codes	Adopted the 2015 IECC building code/adopted stretch code	
Appliance and equipment energy efficiency standards	Green building requirements for some private buildings	
	Required building retrofit or retro commissioning	
Transport		
Freight plan with multimodal freight strategies	Car sharing program	
Efficient vehicle requirement for public fleet procurement	Bike sharing program	
Integrating transport and land use in comprehensive plans	Sustainable transportation plan	
Dedicated funding streams for public transit	Fuel efficiency requirement for public fleets	

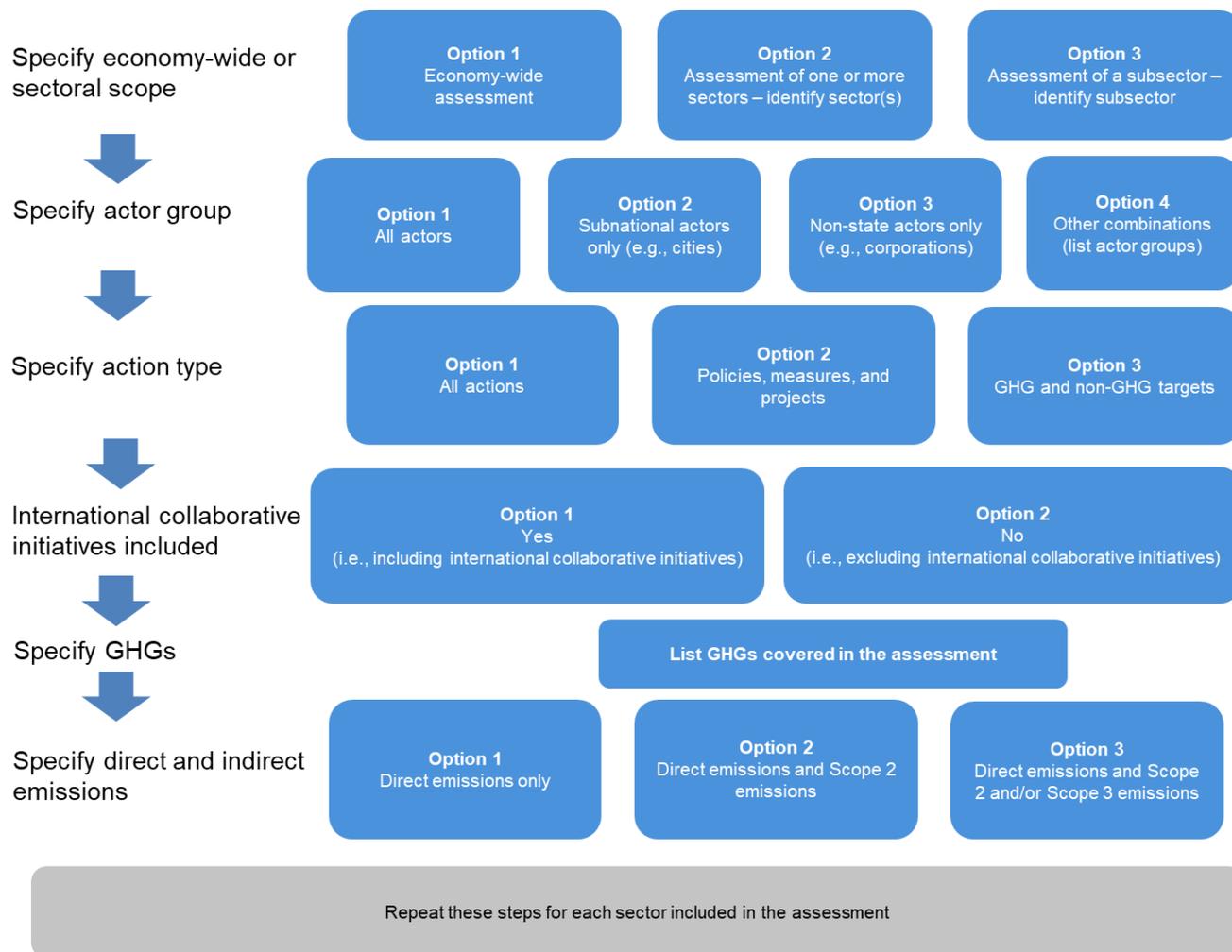
Financial incentives for high efficiency vehicles	Codified VMT/transportation-related GHG targets	
Clean streets legislation	Codified travel mode target	
California's vehicle emission standards	Vehicle infrastructure incentives	
Zero Emission Vehicle mandate	Vehicle purchase incentives	
Low carbon fuel standard	No minimum parking requirements for new developments	
Freight specific energy efficiency performance metrics	Efficient freight strategy	
	Adopted technologies to help coordinate freight transport	
Forestry and land use		
Property tax programs to support sustainable forests	Urban heat island goals	
Conservation easement tax credits		
Cost-sharing programs to improve forest systems		
Wildfire protection incentives		
Methane		
Landfill gas energy project incentive	Zero-waste goal	Joining EPA's Natural Gas Star program
Rules and incentives to reduce food waste		Joining EPA's Methane Challenge
Coal mine methane standards		Taking actions that reduce food waste 50%
Methane standards for existing oil and natural gas facilities		
Setting methane emission reduction targets		
HFCs		
HFC management program (stronger than EPA)		Supermarkets committing to reduce HFC emissions and use

Source: (America's Pledge, 2017).

4.1 Choose which sectors and subsectors to include

Users should identify whether the assessment is economy-wide or is applicable to specific sectors. Users can consider defining sectors and sub-sectors according to IPCC categories (Figure 4.1 and Figure 4.2), or could follow the categorisation followed in country-specific models or tools. Users wishing to carry out an economy-wide assessment should cover sectors and subsectors contributing to at least 95% of total national emissions or removals, or 95% of projected national emissions or removals.¹ This will ensure that the coverage can truly be considered economy-wide.

Figure 4.1: Defining the assessment boundary



¹ This relates to the concept of 'key source analysis' in the IPCC guidance for national GHG inventories, which identifies sources that contribute to 95% of the total emissions or 95% of the trend of the inventory in absolute terms.

4.2 Choose which actor groups to include

Users should first identify which actor groups the assessment will include (Figure 4.1). The scope can include actions taken by all or a subset of the following types of actors:

- Cities
- States, provinces, and regions
- Companies
- Investors
- Civil society organisations
- Others

Users may choose to focus on one group of actors such as cities or states or businesses. Alternatively, users may wish to focus more broadly on all actor groups. Depending on the objectives and data availability, specific sub-groups may be targeted such as cities of a certain size, or businesses within a specific economic sector (Figure 4.1).

4.3 Choose which action types to include

Users should determine which types of actions by the selected actor groups are included in the analysis (Figure 4.1):

- GHG reduction targets
- Sectoral (non-GHG) targets such as targets for renewable energy or forests, and/or
- Specific policies, measures, and projects taken to reduce emissions.

Users may want to consider data availability and levels of uncertainty around different actions when deciding which action types to include. Quantitative GHG emission reduction targets, or commitments, may have uncertainty around their likelihood of being achieved. On the other hand, specific policies, programs and activities may be more difficult to convert into quantitative GHG reduction outcomes and therefore may involve greater uncertainties. Users may wish to include all types of actions in their assessment which may increase uncertainty, but provide a more comprehensive indication of potential impact. On the other hand, a narrow selection of action types may reduce uncertainty, but may not provide a full picture of the potential impacts.

Users should also specify whether international cooperative initiatives are included in the assessment (Figure 4.1). International collaborative actions, in particular with commitments spanning across geographical boundaries, may prove challenging as an accurate disaggregation of impacts by individual countries will depend on sufficient information availability. Users may want to include these initiatives for a comprehensive indication of potential impact, or exclude them to minimise uncertainty.

Users may also want to decide if actions to reduce emissions from sources that are excluded from national totals in inventories (e.g., emissions from international aviation and maritime transport) should be included in the assessment. As these categories generally involve multiple countries, any analysis involving these sectors should be undertaken, and documented, separately from the main assessment.

4.4 Choose which types of GHGs and indirect emissions to include

Users should also specify the greenhouse gases and types of indirect emissions included within the identified (sub)sector(s) in the assessment (Figure 4.1).

Greenhouse gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃). Users can assess the impacts of non-state and subnational actions on all or a subset of GHGs, depending on data availability.

Specifying which direct and indirect emissions are included in the assessment is necessary to clearly define the scope of the assessment and prevent any possible double counting between multiple subnational and non-state actors. Direct emissions are presumed to be accounted for, but users should specify whether and which indirect emissions will be included in the assessment. The definition of direct and indirect emissions is different for businesses and organisations versus cities and subnational regions.

A corporate GHG inventory (which applies to organisations of any type including businesses, government agencies, and civil society organisations) classifies emissions according to scopes (scopes 1, 2, and 3) (WRI and WBCSD, 2004):

- Scope 1 (direct emissions): Emissions that occur from sources owned or controlled by the company. For example, emissions from stationary fuel combustion, mobile fuel combustion in company-owned vehicles, and process-related emissions such as from calcination in the cement industry.

Indirect emissions are a consequence of the company's activities, but occur at sources not owned or controlled by the company. These are further divided into Scope 2 and Scope 3 emissions.

- Scope 2: Indirect emissions resulting from the use of purchased electricity, heat, or steam.
- Scope 3: All other indirect emissions that occur in the company's value chain (e.g., employee commuting, outsourced production activities, use of sold products).

A city or subnational GHG inventory classifies emissions into scopes relative to the city or subnational geopolitical boundary (adapted from WRI, C40 and ICLEI 2014):

- Scope 1: GHG emissions from sources located within the city or subnational boundary
- Scope 2: GHG emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the city or subnational boundary
- Scope 3: All other GHG emissions that occur outside the city or subnational boundary as a result of activities taking place within the city or subnational boundary

One company's scope 2 or 3 emissions are another company's scope 1 emissions, while one city's scope 2 or 3 emissions are another city's scope 1 emissions. Scope 1 emissions of a business located within a city are also the scope 1 emissions of that city.

Users may want to restrict the analysis to scope 1 (direct) emissions of selected actor groups to avoid complications arising from indirect emissions. Alternatively, users may want to address scope 2 emissions but not scope 3 emissions. Narrowing the assessment boundary would be a conservative approach which is likely to underestimate the aggregated impacts from non-state and subnational actions, but would avoid uncertainties and possible double counting between actor groups.

In contrast to non-state and subnational inventories, national GHG inventories categorise emissions by source. For example, emissions from fossil fuel combustion across sectors (e.g., the cement, iron and steel, and aluminium sectors) are listed under a single category. Similarly, industrial process emissions are aggregated and reported in a single category, though disaggregated totals are often available for process emissions from major-emitting industries (e.g., cement, and iron and steel). Therefore, emissions from purchased electricity used in iron and steel industry is accounted under electricity generation in national inventories whereas the iron and steel company will account these as scope 2 emissions.

These differences in emissions accounting present a challenge. For the sake of simplicity, this guidance therefore suggests to follow the IPCC categories which lists GHG emissions by (direct) sources of emissions and removals by sinks (Figure 4.2),² but to carefully consider the effect of mitigation actions on reducing electricity use and related (indirect) emissions. For example, international collaborative actions from companies in the waste sector should be accounted for in the waste sector, while any effect those actions may have on electricity generation should be accounted for in the energy supply sector. Some examples are further illustrated in Box 4.1. Users may also want to carefully note any details related to direct and indirect emissions of a given non-state or subnational action, if provided by those actors, as this may be valuable information for use in later steps to determine any gaps or overlap.

Box 4.1: Examples of determining the assessment boundary based on the objective of the assessment

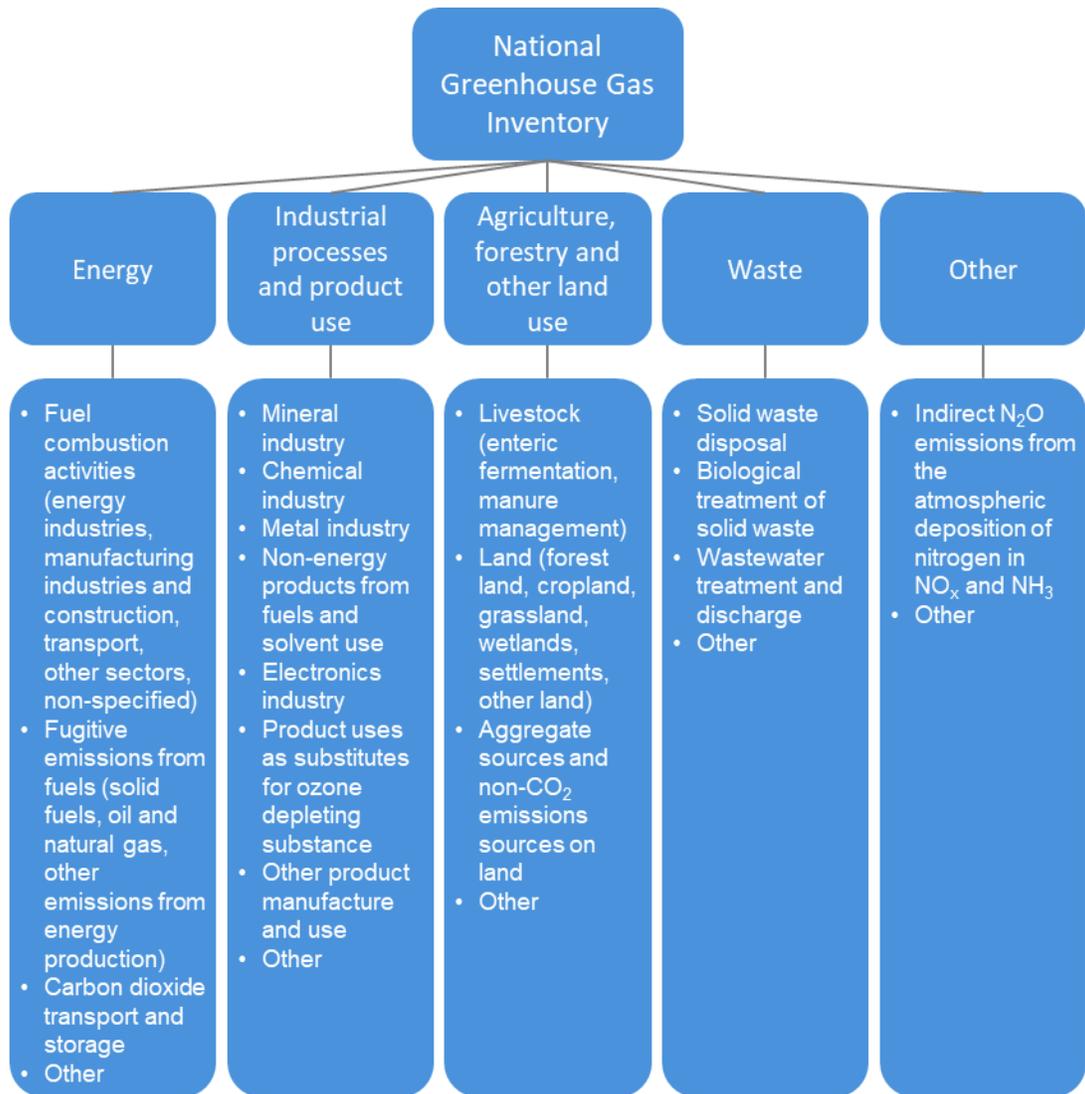
Objective of assessment: Identify, quantify and integrate the impact of non-state and subnational action to revise overall national emissions projections for 2030. Users should go through the steps for all relevant sectors and subsectors identified in the 2006 IPCC guidelines for national greenhouse gas inventories.

Objective of assessment: Identify, quantify and integrate the impact of non-state and subnational action when designing a roadmap to decarbonise the national transport sector by 2050. Users should apply the steps for the transport sector (direct emissions) and the energy supply sector (indirect emissions resulting from the production of electricity consumed by electric vehicles).

Objective of assessment: Identify, quantify and integrate the impact of non-state and subnational action on energy efficiency of passenger cars sold nationally by 2030. Users should apply the steps only to this specific subsector (road transportation).

² IPCC 2006a

Figure 4.2: Main categories of GHG emissions by sources and removals by sinks



Source: IPCC 2006b.