**Draft**

**Guidance Note**

**ICMAI Sustainability Standard ( ISS 2 )**

**Climate related disclosures**

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**Objective** The objective of this non – authoritative Application Guidance is to support the implementation activities of preparers and others using ISS 2

###### ISS 2 requires an entity shall consider its exposure to climate-related risks, their impact as well as opportunities in its assessment of its context and circumstances while providing climate-related disclosures. This provides facilitates for determination of relevant and appropriate approach to climate-related disclosures which may be quantitative, non –quantitative.

**1.Climate related risk**

###### Physical Risks

Physical risks resulting from climate change can be event driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks may have financial implications for organizations, such as direct damage to assets and indirect impacts from supply chain disruption. Organizations’ financial performance may also be affected by changes in water availability, sourcing, and quality; food security; and extreme temperature changes affecting organizations’ premises, operations, supply chain, transport needs, and employee safety.

###### 1.1.1 Acute Risk

Acute physical risks refer to those that are event-driven, including increased severity of extreme weather events, such as cyclones, hurricanes, or floods.

###### 1.1.2 Chronic Risk

Chronic physical risks refer to longer-term shifts in climate patterns (e.g., sustained higher temperatures) that may cause sea level rise or chronic heat waves.

**1.2 Transition Risks**

Transitioning to a lower-carbon economy may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. Depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of financial and reputational risk to organizations.

###### 1.2.1 Policy and Legal Risks

Policy actions around climate change continue to evolve. Their objectives generally fall into two categories—policy actions that attempt to constrain actions that contribute to the adverse effects of climate change or policy actions that seek to promote adaptation to climate change. Some examples include implementing carbon-pricing mechanisms to reduce GHG emissions, shifting energy use toward lower emission sources, adopting energy-efficiency solutions, encouraging greater water efficiency measures, and promoting more sustainable land-use practices. The risk associated with and financial impact of policy changes depend on the nature and timing of the policy change

**1.2.2 Technological risk**

Technological improvements or innovations that support the transition to a lower-carbon, energy- efficient economic system can have a significant impact on organizations. For example, the development and use of emerging technologies such as renewable energy, battery storage, energy efficiency, and carbon capture and storage will affect the competitiveness of certain organizations, their production and distribution costs, and ultimately the demand for their products and services from end users. To the extent that new technology displaces old systems and disrupts some parts of the existing economic system, winners and losers will emerge from this “creative destruction” process. The timing of technology development and deployment, however, is a key uncertainty in assessing technology risk

###### 1.2.3 Market Risk

While the ways in which markets could be affected by climate change are varied and complex, one of the major ways is through shifts in supply and demand for certain commodities, products, and services as climate-related risks and opportunities are increasingly taken into account.

**1.2.4 Reputational risk**

Climate change has been identified as a potential source of reputational risk tied to changing customer or community perceptions of an entity’s contribution to or distraction from the transition to a lower carbon economy

###### 1.3 Climate-related risks include negative effects of climate change on performance, prospects and cash flows of an entity over short, medium and long term. These risks are categorized as climate-related physical risks and climate-related transition risks. Climate-related opportunities refers to the positive effects and impacts arising from efforts to mitigate and adapt to climate change.

**1.4** An entity shall disclose information that enables stakeholders to understand the climate-related risks and opportunities that could reasonably be expected to affect the entity**’**s performance, prospects and cash flows, over the short, medium or long term.Specifically, the entity shall:

a)describe climate-related risks and opportunities that could reasonably be expected to affect the entity**’**s performance, prospects and cash flows, over the short, medium or long term

b)explain, for each climate-related risk the entity has identified, whether the entity considers the risk to be a climate-related physical risk or climate-related transition risk;

c)specify, for each climate-related risk and opportunity the entity has identified, over which time horizons**—**short, medium or long term**—** the effects of each climate-related risk and opportunity could reasonably be expected to occur; and

d)explain how the entity defines **‘**short term**’**, **‘**medium term**’** and **‘**long term**’** and how these definitions are linked to the planning horizons used by the entity for strategic decision-making.

**1.5** In identifying the climate-related risks and opportunities that could reasonably be expected to affect an entity**’**s prospects, the entity shall use all reasonable and supportable information that is available to the entity at the reporting date without undue cost or effort, including information about past events, current conditions and forecasts of future conditions.

**1.6** an entity should use climate-related scenario analysis to assess its climate resilience, using an approach that is commensurate with its circumstances. The entity is required to use an approach to climate-related scenario analysis that enables it to consider all reasonable and supportable information that is available to the entity at the reporting date without undue cost or effort.

**1.7** An entity shall use an approach to climate-related scenario analysis that is commensurate with its circumstances as at the time the entity carries out its climate-related scenario analysis. To assess its circumstances the entity shall consider:

1. the entity**’**s exposure to climate-related risks and opportunities ,and
2. the skills, capabilities and resources available to the entity for the climate-related scenario analysis

**1.8** Climate-related scenario analysis can be resource intensive and might**—** through an iterative learning process**—**be developed and refined over multiple planning cycles. As an entity repeats the climate-related scenario analysis, it is likely to develop skills and capabilities that will enable the entity to strengthen its approach to climate-related scenario analysis over time

**2. Determining the appropriate approach**

# **2.1** An entity shall use an approach for disclosure of climate risk - related information that is appropriate and in line with the context and circumstances prevailing at the time the entity provides sustainability- related Information. Context and circumstances may be assessed based on consideration of the following factors :

1. The susceptibility of the entity with regard to climate - related risks and opportunities.
2. The availability of necessary skills and resources for providing climate risk - related disclosures.

**2.2** An entity shall determine an approach to climate-related scenario analysis that enables it to consider all reasonable and supportable information that is available to the entity at the reporting date without undue cost or effort. The determination of the approach shall be informed by the assessments of the entity**’**s exposure to climate-related risks and opportunities and its available skills, capabilities and resources. Making such a determination involves:

1. selecting inputs to the climate-related scenario analysis, and
2. making analytical choices about how to carry out the climate-related scenario analysis

**2.3** An entity will need to use judgement to determine the mix of inputs and analytical choices that will enable the entity to consider all reasonable and supportable information that is available to the entity at the reporting date without undue cost or effort.

**2.4** the entity might carry out its climate-related scenario analysis in line with its strategic planning cycle, including a multi-year strategic planning cycle (for example, every three to five years).

### **2.5 Selecting inputs**

**2.5.1** When an entity selects the inputs to use in its climate-related scenario analysis, the entity shall consider all reasonable and supportable information—including scenarios, variables and other inputs which may be quantitative or qualitative ,available to the entity at the reporting date without undue cost or effort.

**2.5.2** In considering whether the selected inputs are reasonable and supportable, an entity shall consider the objective of ISS 1 which requires the entity to disclose information that enables stakeholders to understand the impact and resilience of the entity’s strategy and business model to climate-related changes, developments and uncertainties, taking into consideration the entity’s identified climate-related risks and opportunities. This means that the inputs to the entity’s climate-related scenario analysis shall be relevant to the entity’s circumstances,

**2.6 Assessing Impacts**

Each type of climate risk exposure shall be treated as distinct. The process for determining material climate risk exposure shall be as under:

1. Understand the entity’s context and circumstances.
2. Identify actual and potential risks and their likely impacts.
3. Assess the significance of the risks and their impact.
4. Prioritize the most significant risks and their impacts for climate risk reporting.

**2.6.1** Climate related metrics : cover a wide range of activities impacting climate, waste, and energy use. Climate related KPIs include:

* CO2 emissions reduction in kt
* Energy consumption in kWh
* Water usage in metric tons
* Waste reduction in cubic meters
* Plastic reduction in metric tons
* Material efficiency in material input per unit of service (MIPS)
* Noise pollution in decibels
* Compliance with chemical safety requirements
* Compliance with environmental standards
* Number of suppliers audited against environmental standards
* **Greenhouse Gas (GHG) emissions:** A company may report on its [Scope 1, Scope 2, and Scope 3 emissions](https://plana.earth/academy/what-are-scope-1-2-3-emissions), measured in metric tons of CO2 equivalent (CO2e).
* **Energy consumption:** Total energy usage is measured in megawatt-hours (MWh) or gigajoules (GJ). It can be further divided into renewable vs. non-renewable energy usage.
* **Water usage:** This metric typically measures the total amount of water a company withdraws, consumes, or discharges.
* **Waste management:** The amount of waste generated, diverted from landfills, or recycled, reported in metric tons.

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| **2.6.2** Entities should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning. Entities should consider including the impact on their businesses and strategy in the following areas:  ‒ Products and services |
| ‒ Supply chain and/or value chain |
| ‒ Adaptation and mitigation activities |
| ‒ Investment in research and development |
| ‒ Operations (including types of operations and location of facilities) |
| Entity should provide a holistic picture of the interdependencies among the factors that affect their performance, prospects and cash flows in the short, medium and long term. |
| **2.6.3** Entities should also consider including |
| in their disclosures the impact on financial planning in the following areas: |
| ‒ Operating costs and revenues |
| ‒ Capital expenditures and capital allocation |
| ‒ Acquisitions or divestments |
| ‒ Access to capital |

* 1. **Governance**

1. Disclose the organization’s governance around climate- related risks and opportunities

ii)Describe the board’s oversight of climate-related risks and opportunities.

iii)Describe management’s role in assessing and managing climate-related risks and opportunities.

**2.8 Strategy**

1. Disclose the actual and potential impacts of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning where such information is material.
2. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.
3. Describe the impact of climate- related risks and opportunities on the organization’s businesses, strategy, and financial planning.
4. Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios,

**2.9 Risk Management**

1. Disclose how the organization identifies, assesses, and manages climate-related risks.
2. Describe the organization’s processes for identifying and assessing climate-related risks
3. Describe the organization’s processes for managing climate-related risks.
4. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management.

### **2.15 Emission factors**

As part of an entity**’**s disclosure of the measurement approach, inputs and assumptions, the entity shall disclose information to enable users of general purpose financial reports to understand which emission factors the entity uses in its measurement of its greenhouse gas emissions. This Standard does not specify emission factors an entity is required to use in its measurement of its greenhouse gas emissions instead, this Standard requires an entity to use emission factors that best represent the entity**’**s activity as its basis for measuring its greenhouse gas emissions.

**3.Scenario Analysis**

ISS 2 requires an entity to use climate-related scenario analysis to assess its climate resilience, using an approach that is commensurate with its circumstances. The entity is required to use an approach to climate-related scenario analysis that enables it to consider all reasonable and supportable information that is available to the entity at the reporting date without undue cost or effort.

In conducting scenario analysis, entities should *strive* to achieve

* transparency around parameters, assumptions, analytical approaches, and time frames;
* comparability of results across different scenarios and analytical approaches;
* adequate documentation for the methodology, assumptions, data sources, and analytics;
* consistency of methodology year over year;

**3.1** sound governance over scenario analysis conduct, validation, approval, and application requires an entity to use climate-related scenario analysis to assess its climate resilience, using an approach that is commensurate with its circumstances. The entity is required to use an approach to climate-related scenario analysis that enables it to consider all reasonable and supportable information that is available to the entity at the reporting date without undue cost or effort.

**4.** GHG accounting and reporting shall be based on the following principles:

**4.1 RELEVANCE -** Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company. An important aspect of relevance is the selection of an appropriate inventory boundary that reflects the substance and economic reality of the company’s business relationships, not merely its legal form. The choice of the inventory boundary is dependent on the characteristics of the company, the intended purpose of information, and the needs of the users

When choosing the inventory boundary, a number of factors should be considered, such as: • Organizational structures: control (operational and financial), ownership, legal agreements, joint ventures, etc. • Operational boundaries: on-site and off-site activities, processes, services, and impacts • Business context: nature of activities, geographic locations, industry sector(s), purposes of information, and users of information

**4.2 COMPLETENESS -** Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions. All relevant emissions sources within the chosen inventory boundary need to be accounted for so that a comprehensive and meaningful inventory is compiled. In practice, a lack of data or the cost of gathering data may be a limiting factor. Sometimes it is tempting to define a minimum emissions accounting threshold (often referred to as a materiality threshold) stating that a source not exceeding a certain size can be omitted from the inventory. Technically, such a threshold is simply a predefined and accepted negative bias in estimates (i.e., an underestimate).

**4.3 CONSISTENCY -** Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.

Users of GHG information will want to track and compare GHG emissions information over time in order to identify trends and to assess the performance of the reporting company. The consistent application of accounting approaches, inventory boundary, and calculation methodologies is essential to producing comparable GHG emissions data over time. The GHG information for all operations within an organization’s inventory boundary needs to be compiled in a manner that ensures that the aggregate information is internally consistent and comparable over time. If there are changes in the inventory boundary, methods, data or any other factors affecting emission estimates, they need to be transparently documented and justified.

**4.4 TRANSPARENCY** - Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.

Transparency relates to the degree to which information on the processes, procedures, assumptions, and limitations of the GHG inventory are disclosed in a clear, factual, neutral, and understandable manner based on clear documentation and archives (i.e., an audit trail). Information needs to be recorded, compiled, and analyzed in a way that enables internal reviewers and external verifiers to attest to its credibility. Specific exclusions or inclusions need to be clearly identified and justified, assumptions disclosed, and appropriate references provided for the methodologies applied and the data sources used. The information should be sufficient to enable a third party to derive the same results if provided with the same source data. A “transparent” report will provide a clear understanding of the issues in the context of the reporting company and a meaningful assessment of performance. An independent external verification is a good way of ensuring transparency and determining that an appropriate audit trail has been established and documentation provided.

**4.5 ACCURACY -** Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

Data should be sufficiently precise to enable intended users to make decisions with reasonable assurance that the reported information is credible. GHG measurements, estimates, or calculations should be systemically neither over nor under the actual emissions value, as far as can be judged, and that uncertainties are reduced as far as practicable. The quantification process should be conducted in a manner that minimizes uncertainty. Reporting on measures taken to ensure accuracy in the accounting of emissions can help promote credibility while enhancing transparency.

**5. Setting Organizational boundaries**

Business operations vary in their legal and organizational structures; they include wholly owned operations, incorporated and non-incorporated joint ventures, subsidiaries, and others. For the purposes of financial accounting, they are treated according to established rules that depend on the structure of the organization and the relationships among the parties involved. In setting organizational boundaries, a company selects an approach for consolidating GHG emissions and then consistently applies the selected approach to define those businesses and operations that constitute the company for the purpose of accounting and reporting GHG emissions.

For corporate reporting, two distinct approaches can be used to consolidate GHG emissions: the equity share and the control approaches. Companies shall account for and report their consolidated GHG data according to either the equity share or control approach

**5.1 Equity share approach**

Under the equity share approach, a company accounts for GHG emissions from operations according to its share of equity in the operation. The equity share reflects economic interest, which is the extent of rights a company has to the risks and rewards flowing from an operation.

**452 Control approach**

Under the control approach, a company accounts for 100 percent of the GHG emissions from operations over which it has control. It does not account for GHG emissions from operations in which it owns an interest but has no control. Control can be defined in either financial or operational terms. When using the control approach to consolidate GHG emissions, companies shall choose between either the operational control or financial control criteria.

**6. Consolidation at multiple levels**

The consolidation of GHG emissions data will only result in consistent data if all levels of the organization follow the same consolidation policy. In the first step, the management of the parent company has to decide on a consolidation approach (i.e., either the equity share or the financial or operational control approach). Once a corporate consolidation policy has been selected, it shall be applied to all levels of the organization.

**7. Double counting**

When two or more companies hold interests in the same joint operation and use different consolidation approaches (e.g., Company A follows the equity share approach while Company B uses the financial control approach), emissions from that joint operation could be double counted. This may not matter for voluntary corporate public reporting as long as there is adequate disclosure from the company on its consolidation approach. However, double counting of emissions needs to be avoided in trading schemes and certain mandatory government reporting programs.

**8.1 Scope 1: Direct GHG emissions**

Companies report GHG emissions from sources they own or control as scope 1. Direct GHG emissions are principally the result of the following types of activities undertaken by the company:

• Generation of electricity, heat, or steam. These emissions result from combustion of fuels in stationary sources, e.g., boilers, furnaces, turbines

• Physical or chemical processing. Most of these emissions result from manufacture or processing of chemicals and materials, e.g., cement, aluminum, adipic acid, ammonia manufacture, and waste processing

• Transportation of materials, products, waste, and employees. These emissions result from the combustion of fuels in company owned/controlled mobile combustion sources (e.g., trucks, trains, ships, airplanes, buses, and cars)

• Fugitive emissions. These emissions result from intentional or unintentional releases, e.g., equipment leaks from joints, seals, packing, and gaskets; methane emissions from coal mines and venting; hydrofluorocarbon (HFC) emissions during the use of refrigeration and air conditioning equipment; and methane leakages from gas transport.

**8.2 Scope 2: Electricity indirect GHG emissions**

Companies report the emissions from the generation of purchased electricity that is consumed in its owned or controlled equipment or operations as scope 2. Scope 2 emissions are a special category of indirect emissions. For many companies, purchased electricity represents one of the largest sources of GHG emissions and the most significant opportunity to reduce these emissions. Accounting for scope 2 emissions allows companies to assess the risks and opportunities associated with changing electricity and GHG emissions costs. Another important reason for companies to track these emissions is that the information may be needed for some GHG programs. Companies can reduce their use of electricity by investing in energy efficient technologies and energy conservation. Additionally, emerging green power markets4 provide opportunities for some companies to switch to less GHG intensive sources of electricity. Companies can also install an efficient on site co-generation plant, particularly if it replaces the purchase of more GHG intensive electricity from the grid or electricity supplier. Reporting of scope 2 emissions allows transparent accounting of GHG emissions and reductions associated with such opportunities.

**8.3 Scope 3: Other indirect GHG emissions**

This section provides an indicative list of scope 3 categories

Some of these activities will be included under scope 1 if the pertinent emission sources are owned or controlled by the company (e.g., if the transportation of products is done in vehicles owned or controlled by the company). To determine if an activity falls within scope 1 or scope 3, the company should refer to the selected consolidation approach (equity or control) used in setting its organizational boundaries.

• Extraction and production of purchased materials and fuels

• Transport-related activities

• Transportation of purchased materials or goods

• Transportation of purchased fuels

• Employee business travel

• Employees commuting to and from work

• Transportation of sold products

• Transportation of waste

• Electricity-related activities not included in scope 2

* Extraction, production, and transportation of fuels consumed in the generation of electricity (either purchased or own generated by the reporting company)

• Purchase of electricity that is sold to an end user (reported by utility company)

• Generation of electricity that is consumed in a T&D system (reported by end-user)

* Leased assets, franchises, and outsourced activities— emissions from such contractual arrangements are only classified as scope 3 if the selected consolidation approach (equity or control) does not apply to them.
* Use of sold products and services
* Waste disposal • Disposal of waste generated in operations • Disposal of waste generated in the production of purchased materials and fuels • Disposal of sold products at the end of their life

**9.Tracking Emissions Over Time -** A meaningful and consistent comparison of emissions over time requires that companies set a performance datum with which to compare current emissions. This performance datum is referred to as the base year1 emissions. For consistent tracking of emissions over time, the base year emissions may need to be recalculated as companies undergo significant structural changes such as acquisitions, divestments, and mergers

**10. Choosing a base year -** Companies shall choose and report a base year for which verifiable emissions data are available and specify their reasons for choosing that particular year.

**11. Structural changes -**  in the reporting organization that have a significant impact on the company’s base year emissions. A structural change involves the transfer of ownership or control of emissions-generating activities or operations from one company to another. While a single structural change might not have a significant impact on the base year emissions, the cumulative effect of a number of minor structural changes can result in a significant impact. Structural changes include:

• Mergers, acquisitions, and divestments

• Outsourcing and insourcing of emitting activities

• Changes in calculation methodology or improvements in the accuracy of emission factors or activity data that result in a significant impact on the base year emissions data

• Discovery of significant errors, or a number of cumulative errors, that are collectively significant.

Base year emissions shall be retroactively recalculated to reflect changes in the company that would otherwise compromise the consistency and relevance of the reported GHG emissions information.

No recalculation for organic growth or decline Base year emissions and any historic data are not recalculated for organic growth or decline. Organic growth/decline refers to increases or decreases in production output, changes in product mix, and closures and openings of operating units that are owned or controlled by the company. The rationale for this is that organic growth or decline results in a change of emissions to the atmosphere and therefore needs to be counted as an increase or decrease in the company’s emissions profile over time.

**12. Identifying and Calculating GHG Emissions**

Once the inventory boundary has been established, companies generally calculate GHG emissions using the following steps:

1. Identify GHG emissions sources

2. Select a GHG emissions calculation approach

3. Collect activity data and choose emission factors

4. Apply calculation tools

5. Roll-up GHG emissions data to corporate level

**13. Identify GHG emissions sources**

categorize the GHG sources within that company’s boundaries. GHG emissions typically occur from the following source categories:

• Stationary combustion: combustion of fuels in stationary equipment such as boilers, furnaces, burners, turbines, heaters, incinerators, engines, flares, etc.

• Mobile combustion: combustion of fuels in transportation devices such as automobiles, trucks, buses, trains, airplanes, boats, ships, barges, vessels, etc.

• Process emissions: emissions from physical or chemical processes such as CO2 from the calcination step in cement manufacturing, CO2 from catalytic cracking in petrochemical processing, PFC emissions from aluminum smelting, etc.

• Fugitive emissions: intentional and unintentional releases such as equipment leaks from joints, seals, packing, gaskets, as well as fugitive emissions from coal piles, wastewater treatment, pits, cooling towers, gas processing facilities, etc.

Every business has processes, products, or services that generate direct and/or indirect emissions from one or more of the above broad source categories. The GHG Protocol calculation tools are organized based on these categories..

**14. Process for Identification and reporting of emissions**

**14.1 IDENTIFY SCOPE 1 EMISSIONS**

As a first step, a company should undertake an exercise to identify its direct emission sources in each of the four source categories listed above. Process emissions are usually only relevant to certain industry sectors like oil and gas, aluminum, cement, etc. Manufacturing companies that generate process emi sions and own or control a power production facility will likely have direct emissions from all the main source categories. Office-based organizations may not have any direct GHG emissions except in cases where they own or operate a vehicle, combustion device, or refrigeration and air-conditioning equipment. Often companies are surprised to realize that significant emissions come from sources that are not initially obvious.

**14.2 IDENTIFY SCOPE 2 EMISSIONS**

The next step is to identify indirect emission sources from the consumption of purchased electricity, heat, or steam. Almost all businesses generate indirect emissions due to the purchase of electricity for use in their processes or services.

**14.3 IDENTIFY SCOPE 3 EMISSIONS**

This optional step involves identification of other indirect emissions from a company’s upstream and downstream activities as well as emissions associated with outsourced/contract manufacturing, leases, or franchises not included in scope 1 or scope 2. The inclusion of scope 3 emissions allows businesses to expand their inventory boundary along their value chain and to identify all relevant GHG emissions. This provides a broad overview of various business linkages and possible opportunities for significant GHG emission reductions that may exist upstream or downstream of a company’s immediate operations.

**15. Scope of 3 greenhouse gas emissions**

an entity shall disclose information about its Scope 3 greenhouse gas emissions to enable users of general purpose financial reports to understand the source of these emissions. The entity shall consider its entire value chain (upstream and downstream)

### **16. Scope 3 measurement framework**

**16.1** An entity**’**s measurement of Scope 3 greenhouse gas emissions is likely to include the use of estimation rather than solely comprising direct measurement. In measuring Scope 3 greenhouse gas emissions an entity shall use a measurement approach, inputs and assumptions that result in a faithful representation of this measurement.

**16.2** An entity**’**s measurement of Scope 3 greenhouse gas emissions relies upon a range of inputs. This Standard does not specify the inputs the entity is required to use to measure its Scope 3 greenhouse gas emissions, but does require the entity to prioritize inputs and assumptions using these identifying characteristics (which are listed in no particular order):

1. data based on direct measurement
2. data from specific activities within the entity**’**s value chain
3. timely data that faithfully represents the jurisdiction of, and the technology used for, the value chain activity and its greenhouse gas emissions, and
4. data that has been verified

#### **16. 3 Data based on direct measurement**

Two methods are used to quantify Scope 3 greenhouse gas emissions: direct measurement and estimation. Of these two methods **-** and with all else being equal **–** an entity shall prioritize direct measurement.

**‘**Direct measurement**’** refers to the direct monitoring of greenhouse gas emissions and, in theory, provides the most accurate evidence. However, it is expected that Scope 3 greenhouse gas emissions data will include estimation due to the challenges associated with direct measurement of Scope 3 greenhouse gas emissions.

**16.4 Estimation of Scope 3 greenhouse gas emissions** involves approximate calculations of data based on assumptions and appropriate inputs. An entity that measures its Scope 3 greenhouse gas emissions using estimation is likely to use two types of input:

1. data that represents the entity**’**s activity that results in greenhouse gas emissions (activity data). For example, the entity might use distance travelled as activity data to represent the transport of goods within its value chain.
2. emission factors that convert activity data into greenhouse gas emissions. For example, the entity will convert the distance travelled (activity data) into greenhouse gas emissions data using emission factors.

**16.4.1** **Primary data** for Scope 3 greenhouse gas emissions includes data provided by suppliers or other entities in the value chain related to specific activities in an entity**’**s value chain. For example, primary data could be sourced from meter readings, utility bills or other methods that represent specific activities in the entity**’**s value chain. Primary data could be collected internally (for example, through the entity**’**s own records), or externally from suppliers and other value chain partners (for example, supplier-specific emission factors for purchased goods or services).

**16.4.2 Secondary data** for Scope 3 greenhouse gas emissions is data that is not obtained directly from specific activities within an entity**’**s value chain. Secondary data is often supplied by third-party data providers and includes industry-average data (for example, from published databases, government statistics, literature studies and industry associations). Secondary data includes data used to approximate the activity or emission factors. Additionally, secondary data includes primary data from a specific activity (proxy data) used to estimate greenhouse gas emissions for another activity. If an entity uses secondary data to measure its Scope 3 greenhouse gas emissions, it shall consider the extent to which the data faithfully represents the entity**’**s activities.

**16.5** An entity shall disclose information about the measurement approach, inputs and assumptions it uses to measure its Scope 3 greenhouse gas emissions

**16.6** In preparing disclosures to fulfil the requirements of ISS 2 , an entity shall:

a) consider the time horizons over which the effects of climate-related risks and opportunities could reasonably be expected to occur,

b) consider where in the entity**’**s business model and value chain climate- related risks and opportunities are concentrated (for example, geographical areas, facilities or types of assets)

c) consider the connections between the information disclosed to fulfil the requirements of BRSR. These connections include consistency in the data and assumptions used**—**to the extent possible

**17. Select a calculation approach**

Direct measurement of GHG emissions by monitoring concentration and flow rate is not common. More often, emissions may be calculated based on a mass balance or stoichiometric basis specific to a facility or process. However, the most common approach for calculating GHG emissions is through the application of documented emission factors. These factors are calculated ratios relating GHG emissions to a proxy measure of activity at an emissions source. The IPCC guidelines (IPCC, 1996) refer to a hierarchy of calculation approaches and techniques ranging from the application of generic emission factors to direct monitoring. In many cases, particularly when direct monitoring is either unavailable or prohibitively expensive, accurate emission data can be calculated from fuel use data. Even small users usually know both the amount of fuel consumed and have access to data on the carbon content of the fuel through default carbon content coefficients or through more accurate periodic fuel sampling. Companies should use the most accurate calculation approach available to them and that is appropriate for their reporting context.

**18. Collect activity data and choose emission factors**

For most small to medium-sized companies and for many larger companies, scope 1 GHG emissions will be calculated based on the purchased quantities of commercial fuels (such as natural gas and heating oil) using published emission factors. Scope 2 GHG emissions will primarily be calculated from metered electricity consumption and supplier-specific, local grid, or other published emission factors. Scope 3 GHG emissions will primarily be calculated from activity data such as fuel use or passenger miles and published or third-party emission factors. In most cases, if source- or facilityspecific emission factors are available, they are preferable to more generic or general emission factors. Industrial companies may be faced with a wider range of approaches and methodologies. They should seek guidance from the sector-specific guidelines on the GHG Protocol website (if available) or from their industry associations

**19. Apply calculation tools**

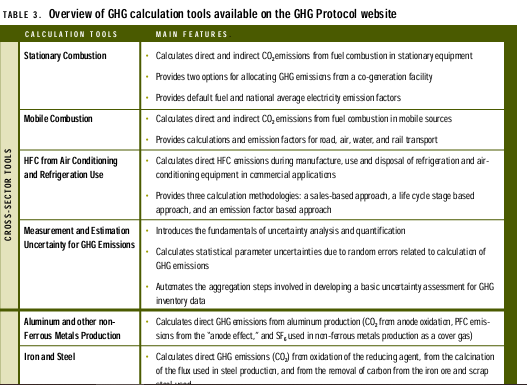
This section provides an overview of the GHG calculation tools and guidance available on the GHG Protocol Initiative website (www.ghgprotocol.org). Use of these tools is encouraged as they have been peer reviewed by experts and industry leaders, are regularly updated, and are believed to be the best available. The tools, however, are optional. Companies may substitute their own GHG calculation methods, provided they are more accurate than or are at least consistent with the GHG Protocol Corporate Standards approaches.

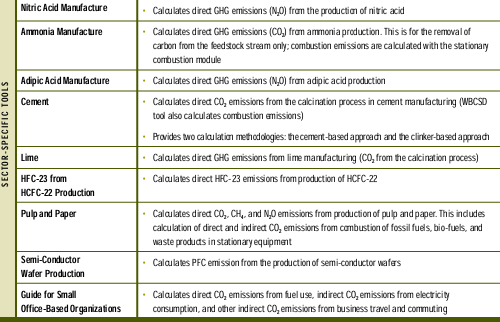
There are two main categories of calculation tools:

• Cross-sector tools that can be applied to different sectors. These include stationary combustion, mobile combustion, HFC use in refrigeration and air conditioning, and measurement and estimation uncertainty.

• Sector-specific tools that are designed to calculate emissions in specific sectors such as aluminum, iron and steel, cement, oil and gas, pulp and paper, officebased organizations.

Most companies will need to use more than one calculation tool to cover all their GHG emission sources. For example, to calculate GHG emissions from an aluminum production facility, the company would use the calculation tools for aluminum production, stationary combustion (for any consumption of purchased electricity, generation of energy on-site, etc), mobile combustion (for transportation of materials and products by train, vehicles employed on-site, employee business travel, etc), and HFC use (for refrigeration, etc). See Table 3 for the full list of tools.

**STEEL USED**

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**20.Roll-up GHG emissions data to corporate level**

To report a corporation’s total GHG emissions, companies will usually need to gather and summarize data from multiple facilities, possibly in different countries and business divisions. It is important to plan this process carefully to minimize the reporting burden, reduce the risk of errors that might occur while compiling data, and ensure that all facilities are collecting information on an approved, consistent basis. Ideally, corporations will integrate GHG reporting with their existing reporting tools and processes, and take advantage of any relevant data already collected and reported by facilities to division or corporate offices, regulators or other stakeholders.

**21. EMISSION FACTORS AND OTHER PARAMETERS**

For a particular source category, emissions calculations will generally rely on emission factors and other parameters (e.g., utilization factors, oxidation rates, methane conversion factors).2 These factors and parameters may be published or default factors, based on companyspecific data, site-specific data, or direct emission or other measurements. For fuel consumption, published emission factors based on fuel energy content are generally more accurate than those based on mass or volume, except when mass or volume based factors have been measured at the company- or site-specific level. Quality investigations need to assess the representativeness and applicability of emission factors and other parameters to the specific characteristics of a company. Differences between measured and default values need to be qualitatively explained and justified based upon the company’s operational characteristics.

**22.EMISSION ESTIMATES** - Estimated emissions for a source category can be compared with historical data or other estimates to ensure they fall within a reasonable range. Potentially unreasonable estimates provide cause for checking emission factors or activity data and determining whether changes in methodology, market forces, or other events are sufficient reasons for the change. In situations where actual emission monitoring occurs (e.g., power plant CO2 emissions), the data from monitors can be compared with calculated emissions using activity data and emission factors.

Estimation uncertainty arises any time GHG emissions are quantified. Therefore all emissions or removal estimates are associated with estimation uncertainty. Estimation uncertainty can be further classified into two types: model uncertainty and parameter uncertainty.

**22.1 Model uncertainty**

refers to the uncertainty associated with the mathematical equations (i.e., models) used to characterize the relationships between various parameters and emission processes. For example, model uncertainty may arise either due to the use of an incorrect mathematical model or inappropriate input into the model. As with scientific uncertainty, estimating model uncertainty is likely to be beyond most company’s inventory efforts; however, some companies may wish to utilize their unique scientific and engineering expertise to evaluate the uncertainty in their emission estimation models.

**22.2 Parameter uncertainty**

refers to the uncertainty associated with quantifying the parameters used as inputs (e.g., activity data and emission factors) into estimation models. Parameter uncertainties can be evaluated through statistical analysis, measurement equipment precision determinations, and expert judgment. Quantifying parameter uncertainties and then estimating source category uncertainties based on these parameter uncertainties will be the primary focus of companies that choose to investigate the uncertainty in their emission inventories.

**23. Climate-related targets**

**23.1** An entity to disclose the quantitative or qualitative climate-related targets it has set, and any it is required to meet by law or regulation, including any greenhouse gas emissions targets. In disclosing these climate-related targets, the entity is required to disclose information about the characteristics of these targets. If the climate-related target is quantitative, an entity is required to describe whether the target is an absolute target or an intensity target. An absolute target is defined as a total amount of a measure or a change in the total amount of a measure, whereas an intensity target is defined as a ratio of a measure, or a change in the ratio of a measure, to a business metric.

**23.2 Setting a GHG Target**

As companies develop strategies to reduce the GHG emissions of their products and operations, corporate-wide GHG targets are often key elements of these efforts

Setting a GHG target involves making choices among various strategies for defining and achieving a GHG reduction. The business goals, any relevant policy context, and stakeholder discussions should inform these choices.

**23.3 Obtain senior management commitment**

As with any corporate wide target, senior management buy-in and commitment particularly at the board/CEO level is a prerequisite for a successful GHG reduction program. Implementing a reduction target is likely to necessitate changes in behavior and decision-making throughout the organization. It also requires establishing an internal accountability and incentive system and providing adequate resources to achieve the target. This will be difficult, if not impossible, without senior management commitment.

**23.4 Decide on the target type**

There are two broad types of GHG targets: absolute and intensity-based. An absolute target is usually expressed in terms of a reduction over time in a specified quantity of GHG emissions to the atmosphere, the unit typically being tonnes of CO2-e. An intensity target is usually expressed as a reduction in the ratio of GHG emissions relative to another business metric.1The comparative metric should be carefully selected. It can be the output of the company (e.g. tonne CO2-e per tonne product, per kWh, per tonne mileage) or some other metric such as sales, revenues or office space. To facilitate transparency, companies using an intensity target should also report the absolute emissions from sources covered by the target.

**23.5 Decide on the target boundary**

The target boundary defines which GHGs, geographic operations, sources, and activities are covered by the target. The target and inventory boundary can be identical, or the target may address a specified subset of the sources included in the company inventory. The quality of the GHG inventory should be a key factor informing this choice. The questions to be addressed in this step include the following:

**23.5.1** **WHICH GHGS?**

Targets usually include one or more of the six major GHGs covered by the Kyoto Protocol. For companies with significant non-CO2 GHG sources it usually makes sense to include these to increase the range of reduction opportunities. However, practical monitoring limitations may apply to smaller sources.

**23.5.2 WHICH GEOGRAPHICAL OPERATIONS?**

Only country or regional operations with reliable GHG inventory data should be included in the target. For companies with global operations, it makes sense to limit the target’s geographical scope until a robust and reliable inventory has been developed for all operations. Companies that participate in GHG programs involving trading2 will need to decide whether or not to include the emissions sources covered in the trading program in their corporate target.

**23.5.3 WHICH DIRECT AND INDIRECT EMISSION SOURCES?**

Including indirect GHG emissions in a target will facilitate more cost-effective reductions by increasing the reduction opportunities available. However, indirect emissions are generally harder to measure accurately and verify than direct emissions although some categories, such as scope 2 emissions from purchased electricity, may be amenable to accurate measurement and verification. Including indirect emissions can raise issues with regard to ownership and double counting of reductions, as indirect emissions are by definition someone else’s direct emissions

**23.6 SEPARATE TARGETS FOR DIFFERENT TYPES OF BUSINESSES?**

For companies with diverse operations it may make more sense to define separate GHG targets for different core businesses, especially when using an intensity target, where the most meaningful business metric for defining the target varies across business units (e.g., GHGs per tonne of cement produced or barrel of oil refined).

**23.6.1 Define the length of the commitment period**

The target commitment period is the period of time during which emissions performance is actually measured against the target. It ends with the target completion date. Many companies use single-year commitment periods, whereas the Kyoto Protocol, for example, specifies a multi-year “first commitment period” of five years (2008–2012). The length of the target commitment period is an important factor in determining a company’s level of commitment. Generally, the longer the target commitment period, the longer the period during which emissions performance counts towards the target

**23.6.2** For each target, the entity shall disclose:

* 1. the metric used to set the target and to monitor progress towards reaching the target;
  2. the specific quantitative or qualitative target the entity has set or is required to meet;
  3. the period over which the target applies;
  4. the base period from which progress is measured;
  5. any milestones and interim targets;
  6. performance against each target and an analysis of trends or changes in the entity’s performance; and
  7. any revisions to the target and an explanation for those revisions.

**23.6.3** In identifying and disclosing the metric used to set a climate-related target and measure progress, an entity shall consider the cross-industry metrics and industry-based metrics

**23.6.4**  If an entity has a greenhouse gas emissions target, the entity is required to specify whether the target is a gross greenhouse gas emissions target or a net greenhouse gas emissions target. Gross greenhouse gas emissions targets reflect the total changes in greenhouse gas emissions planned within the entity**’**s value chain. Net greenhouse gas emissions targets are the entity**’**s targeted gross greenhouse gas emissions minus any planned offsetting efforts (for example, the entity**’**s planned use of carbon credits to offset its greenhouse gas emissions).

**23.6.5**  If an entity uses emission factors to estimate its greenhouse gas emissions, the entity shall use**—**as its basis for measuring its greenhouse gas emissions**—**the emission factors that best represent the entity**’**s activity

**23.6.6** an entity to disclose the measurement approach, inputs and assumptions it uses to measure its greenhouse gas emissions

**24. Decide on the use of GHG offsets or credits**

A GHG target can be met entirely from internal reductions at sources included in the target boundary or through additionally using offsets that are generated from GHG reduction projects that reduce emissions at sources (or enhance sinks) external to the target boundary. The use of offsets may be appropriate when the cost of internal reductions is high, opportunities for reductions limited, or the company is unable to meet its target because of unexpected circumstances. When reporting on the target, it should be specified whether offsets are used and how much of the target reduction was achieved using them.

It is also important to carefully assess the credibility of offsets used to meet a target and to specify the origin and nature of the offsets when reporting. Information needed includes:

• the type of project • geographic and organizational origin

• how offsets have been quantified

• whether they have been recognized by external programs (CDM, JI, etc.)

**25. Track and report progress**

Once the target has been set, it is necessary to track performance against it in order to check compliance, and also—in order to maintain credibility—to report emissions and any external reductions in a consistent, complete and transparent manner.

**25.1 CARRY OUT REGULAR PERFORMANCE CHECKS.**

In order to track performance against a target, it is important to link the target to the annual GHG inventory process and make regular checks of emissions in relation to the target. Some companies use interim targets for this purpose (a target using a rolling target base year automatically includes interim targets every year).

## **26. Climate-Related Opportunities**

Efforts to mitigate and adapt to climate change also produce opportunities for organizations, for example, through resource efficiency and cost savings, the adoption of low-emission energy sources, the development of new products and services, access to new markets, and building resilience along the supply chain. Climate-related opportunities will vary depending on the region, market, and industry in which an organization operates.

The Task Force on Climate related Financial Disclosures identified several areas of opportunity as described below.

###### Resource Efficiency

There is growing evidence and examples of organizations that have successfully reduced operating costs by improving efficiency across their production and distribution processes, buildings, machinery/appliances, and transport/mobility—in particular in relation to energy efficiency but also including broader materials, water, and waste management. Such actions can result in direct cost savings to organizations’ operations over the medium to long term and contribute to the global efforts to curb emissions. Innovation in technology is assisting this transition; such innovation includes developing efficient heating solutions and circular economy solutions, making advances in LED lighting technology and industrial motor technology, retrofitting buildings, employing geothermal power, offering water usage and treatment solutions, and developing electric vehicles.

###### Energy Source

According to the International Energy Agency (IEA), to meet global emission-reduction goals, countries will need to transition a major percentage of their energy generation to low emission alternatives such as wind, solar, wave, tidal, hydro, geothermal, nuclear, biofuels, and carbon capture and storage. For the fifth year in a row, investments in renewable energy capacity have exceeded investments in fossil fuel generation. The trend toward decentralized clean energy sources, rapidly declining costs, improved storage capabilities, and subsequent global adoption of these technologies are significant. Organizations that shift their energy usage toward low emission energy sources could potentially save on annual energy costs.

###### Products and Services

Organizations that innovate and develop new low-emission products and services may improve their competitive position and capitalize on shifting consumer and producer preferences. Some examples include consumer goods and services that place greater emphasis on a product’s carbon footprint in its marketing and labeling (e.g., travel, food, beverage and consumer staples, mobility, printing, fashion, and recycling services) and producer goods that place emphasis on reducing emissions (e.g., adoption of energy-efficiency measures along the supply chain).

###### Markets

Organizations that pro-actively seek opportunities in new markets or types of assets may be able to diversify their activities and better position themselves for the transition to a lower-carbon economy. In particular, opportunities exist for organizations to access new markets through collaborating with governments, development banks, small-scale local entrepreneurs, and community groups in developed and developing countries as they work to shift to a lower-carbon economy. New opportunities can also be captured through underwriting or financing green bonds and infrastructure (e.g., low-emission energy production, energy efficiency, grid connectivity, or transport networks).

###### Resilience

The concept of climate resilience involves organizations developing adaptive capacity to respond to climate change to better manage the associated risks and seize opportunities, including the ability to respond to transition risks and physical risks. Opportunities include improving efficiency, designing new production processes, and developing new products. Opportunities related to resilience may be especially relevant for organizations with long-lived fixed assets or extensive supply or distribution networks; those that depend critically on utility and infrastructure networks or natural resources in their value chain; and those that may require longer-term financing and investment

**27. Tools and Data**

**27.1 Portals with a range of tools and data**

**27.1.1 IASA -** IIASA provides a variety of land, energy, transition, and water tools as well as online databases, including for energy, GHG mitigation strategies, and climate policies consistent with 2°C and IPCC scenarios

**27.1.2 CLIPC** - CLIPC provides access to climate information of direct relevance to a wide variety of users

* It is a “one-stop-shop” platform that allows you to find answers to questions related to climate change and climate impact
* It includes data from satellite and in-situ observations, climate models, data re-analyses, and transformed data products enabling assessment of climate change impact indicators

**27.2 Topic- and/or sector-specific tools**

**27.2.1 WRI -** The World Resources Institute (WRI) built a tool/database to help companies, investors, governments, and communities better understand where and how water risks are emerging around the world

**27.2.2 U.S. EPA CREAT** ­- The U.S. Environmental Protection Agency (EPA) provides a tool known as the Climate Resilience Evaluation and Awareness Tool (CREAT)

It is a risk assessment application for utilities in adapting to extreme weather events through a better understanding of current and future climate conditions

**27.2.3 UNEP & Copenhagen Centre for Energy Efficiency -** Best Practices and Case Studies for Industrial Energy Efficiency Improvement

**27.2.4 MOSAICC -** United Nations Food and Agricultural Organization’s Modelling System for Agricultural Impacts of Climate Change

## **28.** **AI and machine learning for Climate related reporting**

## Using AI and machine learning (ML) for Climate related reporting is a growing trend that will further accelerate in the coming years. Many enterprises and public agencies have already implemented AI and ML in their Climate related reporting initiatives, but they can also be applied to reporting.

## AI-powered tools that identify anomalies or inconsistencies and automate the validation process. ML algorithms that apply uniform metrics to all datasets.

## AI solution that consolidates various kinds of Climate related data across multiple regions into a unified, global sustainability report

## Deploying ML models for predicting future emissions

## Using natural language processing (NLP) for transforming raw data into clear, comprehensible reports for all stakeholder

## Using vision-based AI systems, using ML to predict future waste

## Using AI to analyse Climate related data from multiple external sources and using ML algorithms to automatically generate reports

## NLP-powered systems automatically gathering and analysing reports and audit data from suppliers, ML models that predict potential compliance risks

## AI-powered solution that enhances existing datasets or maps missing data. Enabling the company to see how different actions or strategies could affect sustainability outcomes

APPENDIX 1

APPENDIX 2

APPENDIX 3