



**Sustainable
Stock Exchanges**



Disclosing Climate- Related Metrics

Training Tool



**UN SSE SUSTAINABILITY-RELATED
TOOLKIT FINANCIAL DISCLOSURES**

Introduction

This training tool is designed as a resource for participants of the SSE Academy training on the IFRS Sustainability Disclosure Standards. The tool outlines resources and key concepts to help report preparers implementing the IFRS Sustainability Disclosure Standards, developed in response to a growing number of questions received by the SSE Academy training team on climate-related metrics. This tool provides a high-level overview of cross-industry climate metrics, GHG disclosure, GHG key concepts, GHG measurements and disaggregation of GHG emissions.

Climate-related metrics help users of general-purpose financial reports to understand a company’s performance¹ in relation to its climate-related risks and opportunities (IFRS S2.27). The types of metrics that a company is required to disclose in accordance with IFRS S2 include cross-industry metrics applicable to companies in all industries (IFRS S2.29) as well as industry-based metrics (IFRS S2.32). This tool helps companies to get started with cross-industry metrics. For information on industry-based metrics, companies should review the [IFRS S2 Industry-based Guidance](#).

This training tool does not apply to companies participating in asset management, commercial banking or insurance, or other companies to which specific requirements on financed emissions apply.

Cross-Industry Climate Metrics Overview

A company is required to disclose cross-industry metrics for the reporting period. The disclosure of cross-industry metrics requires a company to use all reasonable and supportable information available at the reporting date without undue cost and effort (IFRS S2.30). Table 1 provides an overview of the 7 cross-industry metrics companies should disclose, a brief description of the metric, and additional factors to be considered where applicable.

Table 1: Summary of cross-industry metrics a company is required to disclose (Source: UN SSE)

Metric, IFRS reference	Description	Factors a company is required to consider
GHG emissions S2.29(a)	Scope 1, 2 and 3 GHG emissions reported on an absolute, gross basis and expressed as metric tonnes of CO ₂ equivalent	<ul style="list-style-type: none"> See guidance below on GHG emissions
Transition risks S2.29(b)	The amount and percentage of assets or business activities vulnerable to climate-related transition risks	<ul style="list-style-type: none"> The time horizons over which climate-related risks and opportunities could reasonably be expected to occur (IFRS S2.B65(a)) Where in the business model or value chain climate-related risks and opportunities are concentrated (IFRS S2.B65(b)) The effects of climate-related risks and opportunities on the company’s financial position, financial performance and cash flows for the reporting period (IFRS S2.B65(c)) Whether industry-based metrics could be used (in whole or in part) to satisfy the cross-industry metrics requirements (IFRS S2.B65(d)) Connections between cross-industry metrics and information disclosed in relation to the related financial statements
Physical risks S2.29(c)	The amount and percentage of assets or business activities vulnerable to climate-related physical risks	
Opportunities S2.29(d)	The amount and percentage of assets or business activities aligned with climate-related opportunities	
Capital deployment S2.29(e)	The amount of capital expenditure, financing or investment deployed towards climate-related risks and opportunities	
Internal carbon prices S2.29(f)	Explain whether and how the company applies a carbon price in decision-making (for example, investment decisions, transfer pricing and scenario analysis); and the price (per metric ton) used to assess the cost of its GHG emissions	
Remuneration S2.29(g)	Describe whether, how and to what extent (by % of remuneration in the current period) climate-related considerations are factored into executive remuneration (noting that the information might have been provided in response to governance requirements)	

¹ Performance in relation to climate-related risks and opportunities is reflected in changes to the entity’s income, expenses, cash flows and operational results that are attributable to the climate-related risks and opportunities it has identified.



Exception for companies in the value chain

Where companies in the value chain have a different reporting period, there could be misalignment of reporting periods. In such cases, a company can report information from companies in its value chain with a different period from its own provided that:

- The most recent data available from those entities is used;
- The length of the reporting period is the same; and
- The company discloses the effects of significant events and changes in circumstances between the reporting dates of the value chain partners and the company (IFRS S2.B19).

GHG Disclosure Overview

Greenhouse gases (GHGs) absorb and re-emit heat and, therefore, keep the planet's atmosphere warmer than it would otherwise be. GHGs occur naturally in the planet's atmosphere but also arise from human activities such as burning fossil fuels. IFRS S2 (Appendix A) defines 'greenhouse gases' as the seven GHGs listed in the Kyoto Protocol.² The Kyoto Protocol is designed (among other things) to control the release of seven GHGs, often known as the Kyoto Gases. They are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆) and nitrogen trifluoride (NF₃). GHG emissions not covered by the Kyoto Protocol (for example, CFCs and NO_x) are generally reported separately. Table 2 provides more detail on the requirements set out by IFRS S2 on disclosure of GHG emissions. In addition, companies should read thoroughly IFRS S2, which provides detailed guidance on the metrics required, as well as application guidance (Appendix B) on greenhouse gasses (B19-63).

Table 2: Factors to consider when disclosing GHG emissions for IFRS S2 (Source: UN SSE)

Requirement	What to disclose
Scope S2.29(a)(i) S2.29(a)(iv) S2.B30 S2.B32 S2.B33	<ul style="list-style-type: none"> ▪ Scope 1, Scope 2 and Scope 3 GHG emissions, considering both direct and indirect GHG emissions. ▪ Location-based Scope 2 and information about any contractual instruments necessary to help users of general-purpose financial reports understand the company's Scope 2 GHG emissions. ▪ Categories included in accordance with the Scope 3 categories described in the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011). ▪ Consider the entire value chain (upstream and downstream) in determining Scope 3 GHG emissions and ensure that the value chain is reassessed in accordance with the requirements on reassessment below. ▪ How the company is managing Scope 3 GHG emissions in cases where it has been impracticable to estimate Scope 3 GHG emissions (after making every reasonable effort to do so) (IFRS S2.B57).
Metric S2.B20-21	<ul style="list-style-type: none"> ▪ All absolute, gross, direct and indirect GHG emissions t expressed as metric tons of CO₂ equivalent using global warming potential values on a 100-year time horizon from the latest Intergovernmental Panel on Climate Change (IPCC) assessment available at the reporting date.
Method S2.29(a)(iii) S2.B26(C) S2.B55 S2.B56	<ul style="list-style-type: none"> ▪ GHGs measured in accordance with the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004), provided that it does not conflict with the requirements in IFRS S2 or any measurement methods prescribed by a jurisdictional authority or an exchange on which the company is listed. ▪ The measurement method, inputs, assumptions and factors used to calculate GHGs, including the reasons for its choice of method and measurement approach. ▪ How the measurement framework has been applied, including the extent to which measurement includes inputs from specific activities within the value chain and the extent to which verified data is used.
Disaggregation S2.29(A)(IV)(1)	<ul style="list-style-type: none"> ▪ The consolidated accounting group disaggregated, which normally comprises the parent and its consolidated subsidiaries. ▪ Other investees (excluded from above) including associates, joint ventures and unconsolidated subsidiaries.

² www.unfccc.int/kyoto_protocol

GHG Key Concepts

To support companies in providing the disclosures required in IFRS S2, certain key concepts should be understood by the report preparers. These core concepts include absolute vs. gross emissions, direct vs. indirect emissions and CO₂ equivalence.

Absolute and gross GHG emissions

- **Absolute** GHG emissions means total GHG emissions as distinct from 'relative' or 'intensity' GHG emissions that are expressed as emissions per unit of output or activity.
- Reporting GHG emissions on a **gross** basis means that a company cannot take account of any reductions or offsets. GHG reductions and offsets are reported separately in response to requirements on strategy and targets.

Direct and indirect GHG emissions

GHG emissions associated with a company's activities and operations are either direct or indirect.

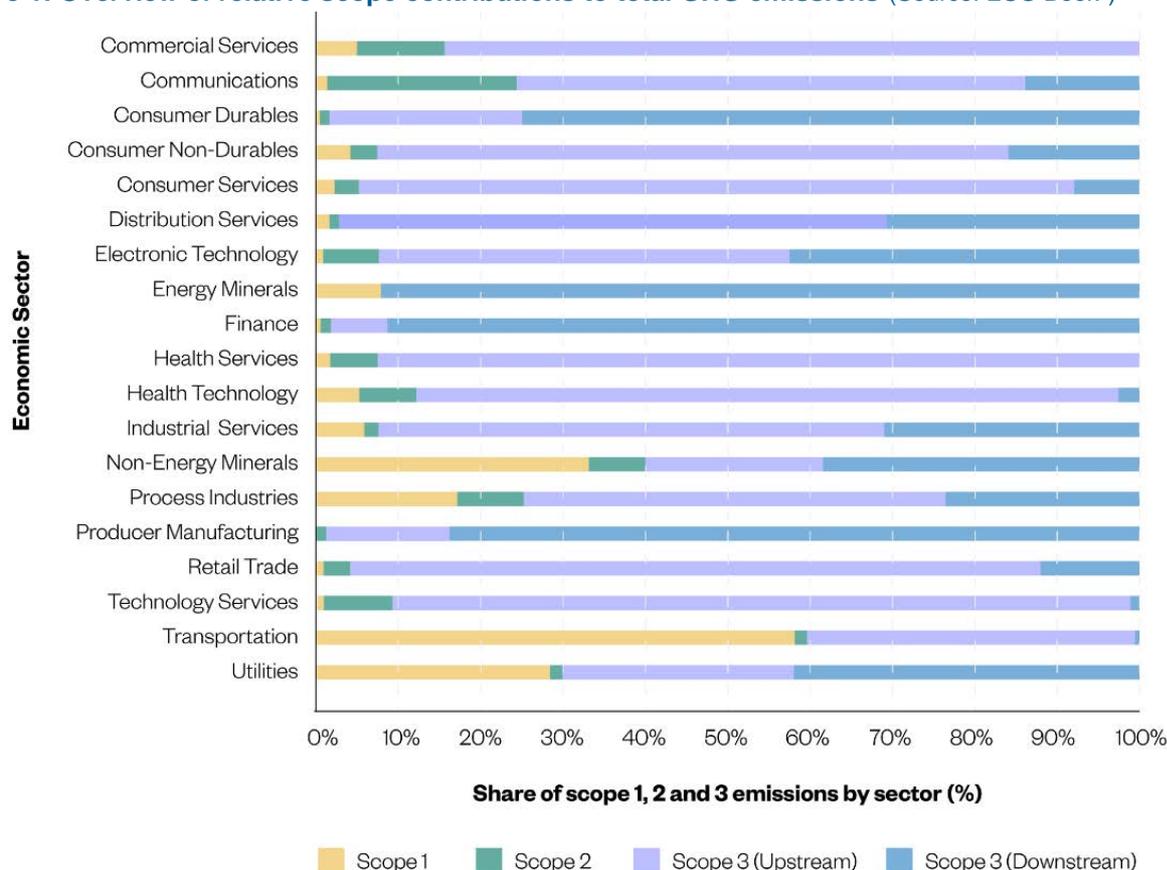
- **Direct GHG emissions** are from sources that are owned or controlled by the company; and.
- **Indirect GHG emissions** occur at sources outside the company because of its activities. The GHG Protocol Corporate Accounting and Reporting Standard (2004) (GHG Protocol) uses the concept of 'scopes' to distinguish between direct and indirect GHG emissions and to differentiate the two types of indirect GHG emissions.
- **Scope 1 direct GHG emissions** are from sources that are owned or controlled by the company such as boilers, furnaces, equipment, facilities and vehicles. For Scope 1, the source categories (GHG Protocol, page 41) are:
 - stationary combustion—combustion of fuels in stationary equipment such as boilers, furnaces, burners, turbines, incinerators engines and flares;
 - mobile combustion—combustion of fuels in transport including cars, trucks, buses, trains, airplanes, boats, ships, barges and other vessels;
 - process emissions from physical or chemical processes, such as CO₂ from the calcination step in cement manufacturing or PFC emissions from aluminum smelting; and
 - fugitive emissions from sources such as equipment leaks, coal piles, wastewater treatment, pits, cooling towers and gas-processing facilities.
- **Scope 2 indirect GHG emissions** are from the generation of electricity (heat and steam) purchased and consumed by the company.
- **Scope 3 indirect GHG emissions** occur from sources outside the company because of its activities, including outsourced activities. Scope 3 GHG emissions are subdivided into:
 - **upstream emissions** from the company's supply chain; and
 - **downstream emissions** from the products and services consumed by the company's customers.

Figure 1 presents an overview of the relative contributions of each scope to a company's total greenhouse gas emissions for different sectors. It can serve as a valuable illustration for companies considering their GHG reporting metrics, offering a means for conducting a preliminary assessment.





Figure 1: Overview of relative scope contributions to total GHG emissions (Source: ESG Book³)



CO₂ equivalent (CO₂-eq) and global warming potential

Greenhouse gas emissions reside in the atmosphere for different lengths of time and they absorb different amounts of heat. The ‘global warming potential’ (GWP) of a GHG indicates the amount of warming a gas causes over a given period (normally 100 years). GWP is the index or factor used to convert all greenhouse gas measurements to ‘CO₂ equivalents’, which describe different GHGs in a common unit. For example, Table 3 shows that 1 unit of methane causes 30 times more warming over a 100-year period compared with 1 unit of CO₂. Therefore, methane has a GWP of 30.

Table 3: Kyoto Gases Global Warming Potential (Source: IPCC 2021, 6th Assessment)

Greenhouse Gas	Global Warming Potential	Example GHG source
Carbon dioxide (CO ₂)	1	Fossil fuel combustion (for example, emissions from electricity production from coal or gas)
Methane (CH ₄)	30	Landfill and animal waste decomposition, natural gas, oil and coal production
Nitrous oxide (N ₂ O)	273	Fertilizers, nitric acid production from manufacturing
Hydrofluorocarbons (HFCs)	5 – 14,600	By-products of industrial processes (for example, chemical production)
Perfluorocarbons (PFCs)	78 – 12,400	Manufacture of semiconductors, refrigeration equipment, aluminum
Sulfur hexafluoride (SF ₆)	25,200	High voltage circuit breakers, switchgear
Nitrogen trifluoride (NF ₃)	17,400	Manufacture of semiconductors and LCD panels, certain types of solar panels and chemical lasers

³ ESG Book, [Scope 3 is the Magic Number](#), Page 4. Data includes average relative contribution of each scope to the total greenhouse gas emissions of a company according to ESG Book’s disclosed emissions data. Companies have been filtered so that only those that report the most material scope 3 emissions, as defined by ESG Book, are included. Data correct as of 16th May 2023.

GHG Measurements

The basic quantification methodology for calculating GHG emissions using an emission factor-based method is outlined by the following calculation:

$$\text{Activity} \times \text{Emission Factor} \times \text{GWP} = \text{CO}_2\text{-eq}$$

Activity is a measure of a level of activity that results in GHG emissions (for example, quarterly liters of fuel or kWh of electricity consumed).

An *emission factor* is a coefficient that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.⁴ Emissions factors are used to convert activity data into GHG emissions. IFRS S2 does not specify which emissions factors a company is required to use. A company is required to use the emissions factors that best represent its activity as the basis for measuring GHG emissions (IFRS S2.B29). Emissions factors can be general, or source or facility specific. They can be calculated by the reporting entity but are more commonly published by third parties.

Paragraph B30 of IFRS S2 requires a company to disclose its location-based Scope 2 greenhouse gas emissions and provide information about any contractual instruments the company has entered into that could inform users' understanding of the company's Scope 2 greenhouse gas emissions. Therefore, a company is required to report against the location-based method and use average energy generation emission factors for defined locations, including local, subnational, or national boundaries.

Sources used for emission factors may differ by jurisdiction (for example, Canadian companies may use the Canada National Inventory Report (NIR) and US companies may use US Environmental Protection Agency (EPA)). If a company also has contractual instruments that meet the Scope 2 Quality Criteria set out in the GHG Protocol, the company may also use the market-based method for Scope 2 accounting with the location-based method. In this case, the company would use the GHG emission factor associated with the qualifying contractual instruments it owns.

Note that a company is generally required to apply emissions factors to activity data converted, if necessary, to match the units used by the emissions factor to calculate GHG emissions. energy units. Therefore, fuel consumption data, for example, needs to be converted to energy units before a company applies emission factors to calculate GHG emissions.

As noted above, global warming potentials produce the carbon dioxide equivalent, CO₂-eq, for any gas. It is the mass of CO₂ that would warm the earth as much as the mass of that gas. Thus, GWP provides a common scale for measuring the climate effects of different gases. It is calculated as GWP times mass of the other gas.

The GHG Protocol does not prescribe a single method for measuring GHG emissions. It allows for a range of different methods including:

- direct measurement of GHG emissions—for example, through monitoring;
- applying emissions factors to proxy measures of activity at an emissions source; and
- using sector-specific approaches.

Choices about which method(s) to use depend on operational and organizational boundary decisions, the company's type of activities, the availability of activity data, the company's approach to gathering data and whether that approach is centralized or de-centralized.

The GHG Protocol explains organizational boundaries (Chapter 3) and operational boundaries (Chapter 4) and offers a range of calculation tools and guidance.

⁴ GHG Management Institute (2022) "[What are emissions factors? And where can I find them?](#)"





GHG Measurement Method

The measurement method includes information about which 'organizational boundaries' the company has chosen to use to define the businesses and operations for which GHG emissions will be reported. Chapter 3 of the GHG Protocol describes two distinct approaches:

- **The equity share approach**—a company accounts for GHG emissions from operations according to its share of equity or economic interest in the operation.
- **The control approach**—a company accounts for 100% of the GHG emissions from operations over which it has either operational control or financial control.

In addition to identifying the distinct approach (IFRS S2.B27(a)), companies are also required to disclose the measurement method the company has chosen (for example, direct, estimation), the inputs, assumptions and emissions factors the company has used, the reasons for the company's approach and how that approach relates to an understanding of the company's performance in relation to its climate-related risks and opportunities (IFRS S2.B26-29). If the company does not measure its GHG emissions in accordance with the GHG Protocol, it is required to disclose the applicable method used, the reasons the company chose that method and how it relates to an understanding of the company's performance in relation to its climate-related risks and opportunities (IFRS S2.B28).

Scope 3 Measurements

IFRS S2 paragraphs B38–B57 set out the measurement framework that must be applied for measuring Scope 3 GHG emissions. Measurement of Scope 3 GHG emissions relies on a range of inputs. IFRS S2 does not specify inputs, but a company is required to give priority to:

- **Data based on direct measurement**, recognizing that Scope 3 GHG emissions will include estimation (IFRS S2.B44). Where estimation is used, inputs are likely to include activity data such as the distance traveled to transport goods within the value chain (IFRS S2.B45(a)); and emissions factors that convert activity data to GHG emissions (IFRS S2.B45(b)). Scope 3 GHG emissions are most likely to be measured using estimation rather than direct measurement. However, a company is required to use a measurement approach, including the inputs and assumptions, that results in a faithful representation of the Scope 3 GHG emissions. The company is also required to use all reasonable information that is available to it at the reporting date without undue cost or effort when measuring Scope 3 GHG emissions.
- **Data obtained directly (primary data) and/or indirectly (secondary data) from specific activities within the company's value chain.** A company is required to prioritize primary data wherever possible. Primary data is sourced from meter readings, utility bills or other methods that represent specific activities in the company's value chain. Primary data could be collected internally (through the company's own records) or externally from suppliers and other value chain partners (IFRS S2.B48). Secondary data is often supplied by third-party data providers and includes industry-average data and data used to approximate the activity or emission factors (IFRS S2.B49).
- **Timely data that faithfully represents the jurisdiction of and the technology used in the value chain activity and associated GHG emissions.** For example, a company is required to consider primary data from its activities, (i.e. the specific aircraft model, distance traveled and travel-class used by employees when traveling) when calculating Scope 3 GHG emissions from business travel (IFRS S2.B50). A company should also consider the use activity, emissions data and emissions factors that relate to the jurisdiction in which the activity took place (IFRS S2.B51). Activities should also be prioritized and emissions data relating to the reporting entity's value chain activity during the reporting period. However, the measurement framework recognizes that some secondary data sources rely on information collected in a reporting period that differs from the reporting entity's own reporting period (IFRS S2.B52).
- **Verified data** can include data that has been internally or externally verified. Verification can take place through on-site checking, reviewing calculations or cross-checking data against other sources. It might be necessary to use unverified data if verification cannot be obtained without undue cost and effort—for example, if the data originates from entities that are separate from the reporting entities by many tiers in the value chain (IFRS S2.B54).

Disaggregation of GHG emissions

Scope 1 and Scope 2 Disaggregation

A company should disclose whether it is using the equity share method or operational/financial control method. However, neither the equity share method, operational control method nor financial control method discussed in *Explainer A.6—Measurement method* perfectly align with the boundaries of the consolidated accounting group under IFRS Accounting or other GAAP. As such, preparers are required to disaggregate these numbers between the consolidated accounting group and other subsidiaries, so that investors, in addition to being able to understand the company’s full Scope 1 and Scope 2 under the equity share method or operational/financial control method, are also able get a metric for the emissions based on the same boundaries used for financial statements. An example of disaggregating Scope 1 and Scope 2 GHG emissions between the consolidated group and its investees is provided in IFRS S2 Illustrative Example IE5.

Scope 2 location disaggregation

A location-based method is a method of allocating GHG emissions to the end consumer of a given grid. It reflects the average emissions intensity of grids on which energy consumption occurs (using mostly grid-average emission-factor data.)

Scope 3 GHG emissions categories

The Scope 3 GHG emissions categories are intended to provide companies with a systematic framework to organize, understand and report on the diversity of Scope 3 activities within a corporate value chain. The categories are divided into upstream and downstream activities (Table 4). Upstream emissions are indirect GHG emissions related to purchased or acquired goods and services up to the point of receipt by the reporting entity. Downstream emissions are indirect GHG emissions related to sold goods and services and occur after their sale and transfer of control from the reporting entity (for example, to a customer).

Table 4: List of Scope 3 Categories (Source: GHG Protocol⁵)

Upstream or downstream	Scope 3 category
Upstream scope 3 emissions	<ol style="list-style-type: none"> 1. Purchased goods and services 2. Capital goods 3. Fuel- and energy-related activities (not included in scope 1 or scope 2) 4. Upstream transportation and distribution 5. Waste generated in operations 6. Business travel 7. Employee commuting 8. Upstream leased assets
Downstream scope 3 emissions	<ol style="list-style-type: none"> 9. Downstream transportation and distribution 10. Processing of sold products 11. Use of sold products 12. End-of-life treatment of sold products 13. Downstream leased assets 14. Franchises 15. Investments



SSE Toolkit on Sustainability-Related Financial Disclosures

This tool is part of a toolkit that the UN SSE, together with its partners, developed to support stock exchanges and their market participants in the implementation of the IFRS Sustainability Disclosure Standards. The toolkit includes training tools that are designed to complement the SSE Academy’s training program on the IFRS Sustainability Disclosure Standards. The SSE will continue to work with its partners to add new tools as necessary to provide ongoing support to stock exchanges and their markets on this topic.

⁵ Table adapted from [GHG Protocol Corporate Value Chain Accounting Reporting Standard](#), Table 5.3



Acknowledgements

This paper was prepared in the context of the United Nations Sustainable Stock Exchanges (SSE). The paper was prepared by Tiffany Grabski (SSE Academy Head) and Mike Zimonyi (SSE Senior Specialist) under the overall supervision of Anthony Miller (SSE Chief Coordinator) and James Zhan (UNCTAD Director of Investment and Enterprise and Chair of the SSE Governing Board).

Lois Guthrie (IFRS Foundation) played a crucial role in conducting research and drafting the text. The report benefited greatly from the feedback and advice of Jarlath Molloy, Anoosha Lalani and Mardi McBrien (IFRS Foundation).

Additional research support and inputs were provided by Vanina Vegezzi (SSE Project Officer) and Corli Le Roux (SSE Senior Specialist). The report was typeset and designed by Sylvana Kempka (SSE Design Assistant).

The SSE gratefully acknowledges the financial support for the production of this report provided by Bloomberg Philanthropies.

About UN SSE

The SSE initiative is a UN Partnership Programme organised by UNCTAD, the UN Global Compact, UNEP FI and the PRI. The SSE's mission is to provide a global platform for exploring how exchanges, in collaboration with investors, companies (issuers), regulators, policy makers and relevant international organisations can enhance performance on environmental, social and corporate governance issues and encourage sustainable investment, including the financing of the UN Sustainable Development Goals. The SSE seeks to achieve this mission through an integrated programme of conducting evidence-based policy analysis, facilitating a network and forum for multi-stakeholder consensus-building, and providing technical guidelines, advisory services and training.

Note

Published in 2024, the designations employed and the presentation of the material in this paper do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. This paper is intended for learning purposes. The inclusion of company names and examples does not constitute an endorsement of the individual exchanges or organisations by UNCTAD, UN Global Compact, UNEP or the PRI. Material in this paper may be freely quoted or reprinted, but acknowledgement is requested. A copy of the publication containing the quotation or reprint should be sent to info@SSEinitiative.org.

