# Guidance Note on Environmental Costing

ICMAI
THE INSTITUTE OF
COST ACCOUNTANTS OF INDIA
(Statutory body under an Act of Parliament)

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**April 2025**

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# FOREWORD
## PRESIDENT, ICMAI

Reducing impact of human activity on the planet is essential for long-term health and sustainability. Humanity's consumption patterns are driving climate change at an alarming rate. The consequences are already evident in rising global temperatures, extreme weather events, and disruption of ecosystems. By taking action to reduce our environmental footprint, we can mitigate severity of these impacts, protect vulnerable communities, preserve biodiversity, and leave a better planet for future generations.

Understanding and tracking environmental impact is the first step toward meaningful climate action. Tracking environmental impact is becoming essential for businesses to stay ahead of competition, and to do their part for the environment, while safeguarding the future of their business. Such tracking will aid companies in achieving sustainability goals by helping understand where one is, in creating strategies to reduce environmental impact, and in becoming a sustainability leader.

However, tracking environmental impact is easier said than done. Every activity a business undertakes, be it for manufacturing or for provision of services, and for the business, can lead to environmental impact in a direct or indirect manner. It is essential, to have a systematic and standardized approach to recording environmental impact, cutting across all kinds of activities, to be able to measure the cumulative environmental impact of the business, across its value-chain.

To address this need, the Professional Development & CPE Committee of the Institute of Cost Accountants of India constituted a Taskforce on Cost and Carbon Convergence and decided to bring out a Guidance Note on Environmental Costing. The foundational idea here being the fact that similar to how every activity of a business has a financial cost implication, every activity also costs the environment (planet) in some form or other. Hence, the Taskforce was entrusted to draw out a framework for environmental costing of business operations.

I am happy that the Task Force has compiled this Guidance Note to provide guidance to the industry for identification of source and quantum of environmental impact, and further facilitate appropriate and factual reporting in the BRSR format.

I am confident this publication will be beneficial to industry, professional members, and other users engaged in providing assurance services. It will also help regulatory bodies assess and analyse environmental impact data given in BRSR Reports filed by corporates, to aid the country to present before various bodies globally.

**(CMA Bibhuti Bhusan Nayak)**
President
The Institute of Cost Accountants of India

New Delhi
Date: 22nd April 2025

# PREFACE
## CHAIRMAN, PROFESSIONAL DEVELOPMENT & CPE COMMITTEE

Humanity's environmental impact is driving climate change and experts worry the change may be irreversible. The time to act on reducing environmental impact is now, as businesses face increasing pressure to become green and contribute to a more sustainable future.

SEBI currently mandates the top 1,000 listed companies to report their environmental impact in the Business Responsibility and Sustainability Reporting (BRSR) format. As Principle 6 in the format lays down, "businesses should respect and make efforts to protect and restore the environment", it is intended to help companies to be transparent about their environmental performance. This transparency helps investors, customers, and other stakeholders make better decisions.

Tracking and measurement are the foundation of any reporting and analytics. Companies must first understand their environmental footprint before taking steps to reduce it. The same is true for reporting needs as well. Further, it is crucial to follow a standardized methodology when calculating the environmental footprint. This not only ensures accuracy but also makes analytics and reporting easy.

To meet this need of businesses for a standardized way of measuring environmental impact, the Professional Development Committee & CPE Committee of the Institute of Cost Accountants of India constituted a Task Force on Convergence of Cost Accounting and Carbon Accounting with the following mandate:

To develop a framework that expands and/or intersects with typical Cost Accounting to include Environmental Costing.

To undertake and conceptualize awareness and capacity building modules on such convergence addressing industry demands.

To recommend standardization and policy pathways for such convergence.

To recommend digitization pathways for assurance, transparency in Environmental Reporting.

To study feasibility and recommend creation of a Certification Programme to create capacity for such Environmental Costing and Reporting in India.

After several rounds of fruitful discussions, the Task Force has brought out this Guidance Note on Environmental Costing.

This Guidance Note presents a Holistic Environmental Costing (HEC) Framework for identification and measurement of environmental impact right from the source i.e. the operations and activities undertaken by the business. As the name suggests, the intention is to accurately measure the cost to the environment of running a business.

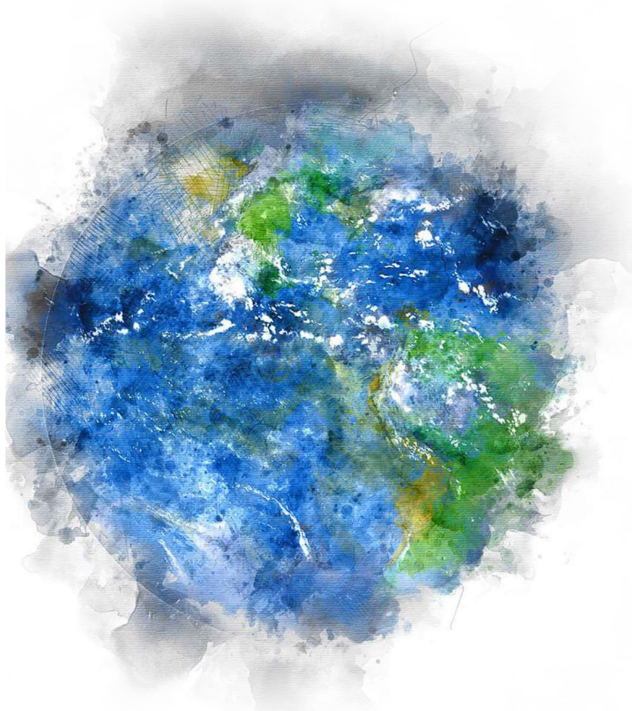
HEC enables multidimensional perspectives of relevance to the business, and overall management of environmental footprint. HEC data mapped on to three layers of relevance for a business viz. Operations Layer, Management Layer, and Reporting Layer, provides insights for internal efficiency improvement, to develop strategies to reduce/manage environmental footprint, and significantly enhances ease of regulatory reporting, generating reports for investors/customers, collating data for ESG rating. green finance, audit and assurance, among others.

On behalf of the Professional Development Committee & CPE Committee, I would like to place on record my deep appreciation of the members of the Task Force namely, Er. Keerthi Lal Kala, CMA Rameesh Kailasam, CMA Pramod Chauhan, CMA (Dr.) S K Gupta and CMA B B Goyal for their invaluable inputs which have given the present shape to this Guidance Note.

I truly believe and trust that this Guidance Note will go a long way in establishing sound environmental costing system in the industry and would be of immense utility to others concerned.

**CMA Manoj Kumar Anand**
Chairman,
Professional Development & CPE Committee
The Institute of Cost Accountants of India

New Delhi
Date: 22nd April 2025



**Govt, Regulators, Investors, Customers**

Pushing industries to reduce environmental impact

**Industry seeking answers to**

What is my environmental impact ?
How can I reduce my environmental impact ?
What is the business value of sustainability actions ?

## Holistic Environmental Costing (HEC) : Developed by ICMAI


HEC led lifecycle environmental impact bookkeeping enables the above

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# GUIDANCE NOTE ON ENVIRONMENTAL COSTING
## Exploiting convergence with Cost Accounting principles

The Institute of Cost Accountants of India (ICMAI) has constituted a Task Force to explore the convergence between cost accounting and enterprise environmental impact assessments. In view of the emerging focus and concern regarding environmental degradation there is a definitive need to develop and derive principles and methods for recording of environmental impact of an industry.

This Guidance Note builds on existing principles and methods of cost accounting, and adapts them for environmental costing. The principles and methods enunciated in this Guidance Note help in practical determination of environmental cost of an enterprise (and its operations) enabling deeper understanding and knowledge for the enterprise to take appropriate actions to reduce its environmental impact.

Further, the Securities Exchange Board of India (SEBI) has mandated enterprises to start publishing environmental data in a standardized format known as the Business Responsibility and Sustainability Report (BRSR) vide its notification number SEBI/HO/CFD/CMD-2/P/CIR/2021/562, dated 10 May 2021. The BRSR format takes into cognizance global standards and norms such as the Global Reporting Initiative (GRI), International Sustainability Standards Board (ISSB) and others. SEBI has been issuing updates to the BRSR format, in consultation with stakeholders, and to keep up with standards evolving globally for reporting. The approach and methods enunciated in Guidance Note facilitate enterprises to seamlessly derive needed data for the BRSR report and for any other global environmental or sustainability reporting needs of an enterprise.

This Guidance Note is expected to act as a recommended method for environmental costing, and not as a prescriptive standard. However ICMAI, in collaboration with stakeholders such as SEBI, is working towards standardizing environmental costing principles, and updates shall be announced when such efforts reach their logical conclusion.

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# 1. Definitions

The following terms are used in the Guidance Note with the meaning specified:

**Activity-based Assessment** : Refers to the approach of evaluating each activity of running a business with respect to a particular factor of interest, for e.g. cost, quality, time, efficiency, waste, energy, etc.

**BRSR** : Acronym for Business Responsibility and Sustainability Report, a format for ESG reporting outlined by SEBI for select listed enterprises in India.

**Circular Economy** : A model of production and consumption that involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.

**Emission Factor** : Multiplication factor used to convert standard units of a substance into equivalent units of tCO2e (please see definition below), with respect to its GWP (please see definition below), for ascertaining Environmental Impact. Emission factors to calculate tCO2e are available for all GHGs (please see definition below) from IPCC (please see definition below) and are updated from time-to-time. The latest, at the time of writing this note, can be accessed free of cost here: https://ghgprotocol.org/sites/default/files/2024-08/Global-Warming-Potential-Values%20%28August%202024%29.pdf

For e.g. emission factor for CH4 is 25, meaning one unit of CH4 is 25 times as harmful, i.e. has 25x the warming/heating potential, to the environment as one unit of CO2. Similarly emission factor for diesel is 2.69 kgCO2e per litre, i.e. to consuming one litre of diesel releases GHGs equal to 2.69 kg of CO2 into the atmosphere. Similar emission factors for various other materials are available either openly or with paid subscriptions online.

**Environmental Cost** : The tangible, intangible cost of running a business on the environment (planet).

**Environmental Impact** : Any impact on the natural environment, whether land, soil, water, plants, animals, geological formations, atmosphere, climate and on the interlinkage between any of these aspects.

**ESG** : An acronym for Environment – Social – Governance. ESG is an area of focus for businesses globally, with the expectation being that businesses should perform well on all the three parameters, along with financial profits.

**ESG Rating** : Based on details provided by businesses of their performance on parameters of interest under ESG and other public or privately available information, various agencies rate companies on overall ESG performance. ESG ratings, similar to credit ratings, are gaining popularity not just in the finance community, but also among governments and other stakeholders alike.

**ESG Report** : A report published by a business to showcase its performance on various parameters under ESG. Various global reporting norms and standards require companies to report on multiple parameters of interest to them. Similarly other stakeholders such as regulators and other stakeholders might seek reports on parameters of interest to them, beyond any existing reporting standard.

**Fugitive Emissions** : Unintentional and undesirable emission, leakage or discharge of gases or vapours from pressurized equipment or facilities, and from components inside an industrial plant such as valves, piping, flanges, pumps, storage tanks, compressors, etc.

**Green House Gases (GHG)** : Gases identified as those that cause global warming when in the planet's atmosphere viz. CO2, N2O, CH4, NF3, SF6, HFC (Hydrofluorocarbons) and PFC (Perfluorocarbons), as defined by IPCC (please see definition below).

**GHG Protocol** : Framework established by United Nations Framework Convention on Climate Change (UNFCCC) for GHG reporting and analysis. All reporting standards and regulations globally build upon this framework.

**GWP** : Acronym for Global Warming Potential, a measure to establish equivalence of global temperature rise potential of all GHGs with respect to CO2 as the base unit.

**IPCC** : Intergovernmental Panel on Climate Change (IPCC) setup by the United Nations Environment Programme and World Meteorological Organization in 1988 to advance scientific knowledge about climate change caused by human activities.

**Lifecycle Assessment** : The approach of considering complete life of a product, from cradle-to-cradle or cradle-to-grave as the case may be.

**Mitigation** : Any activity or set of activities leading to reduction of environmental cost, i.e. environmental footprint of a business operation.

**Particulate Matter** : A term used for a mixture of solid particles and liquid droplets found in the air, large or dark enough to visible to the naked eye, for e.g. dust, soot, etc.

**Scope 1 (S1) Emissions** : Direct GHG emissions into the atmosphere resulting from any business activity inclusive of Fugitive Emissions (please see definition above).

**Scope 2 (S2) Emissions** : Indirect emissions as a result of energy consumption in the form of electricity, cooling, heating or steam.

**Scope 3 (S3) Emissions** : All other indirect but related emissions associated with a business not accounted for in Scope 2.

**tCO2e** or **kgCO2e** : For ease of understanding and comparison the quantum of all GHG emissions is converted into equivalent tonnes or kilograms as the case may be of CO2. The ratio of GWP of any GHG with respect to CO2 is used as the multiplier for such conversion.

■

# 2. Introduction

The focus on becoming environmentally friendly is ever increasing given we are beginning to see the adverse impact of climate change in our daily lives. As such industries, globally, are looking to reduce their environmental footprint in a bid to reduce the harm to the environment (planet) from their operations.

As with any effort to understand reality, recording factual data based on proof of any activity of interest, is the bedrock for comprehensive assessment of environmental impact of an enterprise and its operations. Only with such factual data can an enterprise strategize how to reduce its environmental impact, and also showcase its (positive) credentials to stakeholders and customers.

## 2.1. What is Environmental Impact

Governments, regulators globally are mandating businesses to report their performance on various environmental (impact) parameters of interest. In India, SEBI has mandated reporting in the BRSR format for all listed enterprises. Other regulators in EU, UK, USA, Singapore, Japan, South Korea, Brazil, to name a few have also provided such reporting formats for businesses operating in their geographies. There are also voluntary standards such as GRI, ISSB, CDP and others that have gained popularity over the years.

The environmental impact of an enterprise is its impact on the environment (planet) for carrying out business and operations thereof as a whole, including manufacturing, digital services, farming, mining, logistics, its physical infrastructure such as offices, warehouses or retail stores, business travel, and any other activity that is essential for business.

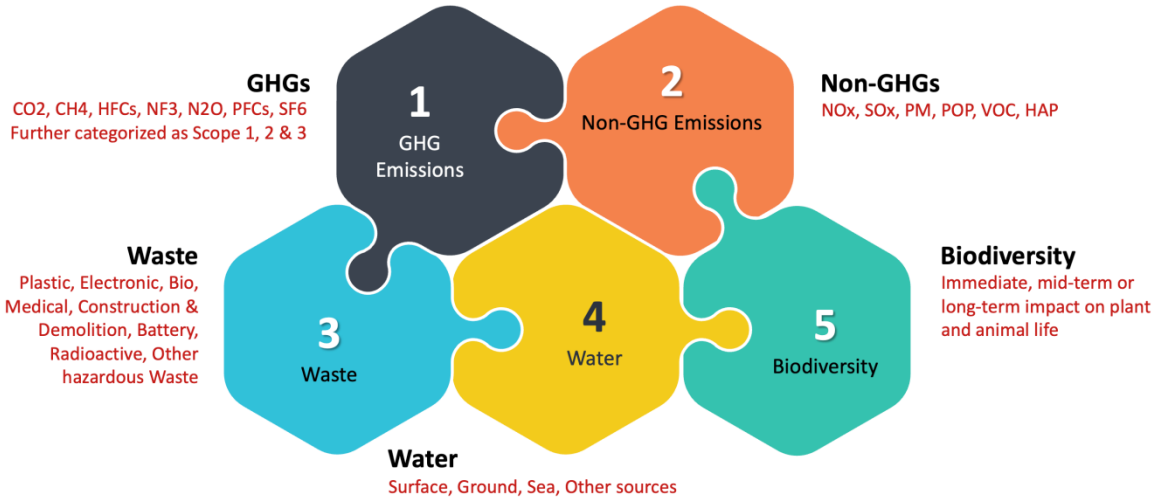


*Figure 1 Categories of Environmental Impact*

## 2.2. Categories of Environmental Impact

Environmental impact emanates from a combination of gaseous emissions, waste and their impact on natural resources used, such as water, impact on biodiversity, forest cover and others. As showcased in Figure 1, an enterprise has to be aware of five categories of environmental impact as described in sections below.

### 2.2.1. GHG Emissions

The following is the list of gases that the UN recommended GHG Protocol (www.ghgprotocol.org) mandates to be measured and reported:

(i) CO2 – Carbon dioxide

(ii) CH4 – Methane

(iii) HFCs – Hydrofluorocarbons

(iv) NF3 – Nitrogen trifluoride

(v) N2O – Nitrous oxide

(vi) PFCs – Perfluorocarbons

(vii) SF6 – Sulphur hexafluoride

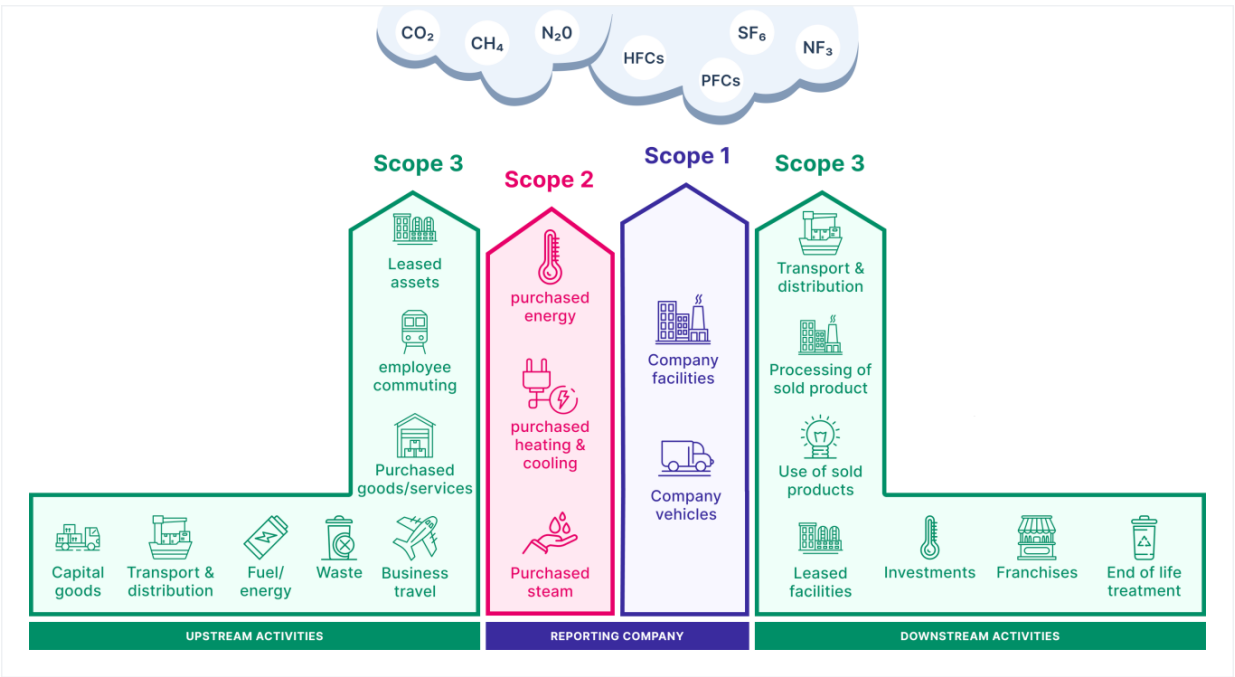


*Figure 2 GHG Scope 1, 2 and 3*

The GHG Protocol further classifies GHG emissions into three categories viz. Scope 1, Scope 2 and Scope 3 for the purposes of reporting. This categorization is to provide insight into the source of these emissions and, for effective actions to reduce such emissions. Figure 2 summarizes the various Scopes and GHG emissions covered within. Please note Scope 3 covers fifteen elements of interest from a GHG emissions perspective.

**Scope 1 Emissions**

Scope 1 covers emissions from sources that a business controls or operates directly. For e.g. emissions from burning fuel such as coal for boilers in factories, emissions from organization's own vehicles are covered here. Further fugitive emissions, such leakages of coolant (HFCs) from air-conditioning equipment, either in factories or in offices owned, though not intended, are also covered within this scope.

**Scope 2 Emissions**

Scope 2 covers emissions that a company causes indirectly and come from where the energy it purchases and uses is produced. For e.g. emissions from generating the electricity consumed by the business for factories, warehouses, offices or retail outlets it owns are covered within this scope.

**Scope 3 Emissions**

Scope 3 encompasses emissions that are not produced by the company itself and are not the result of activities from assets owned or controlled by them, but by those that it is indirectly associated with in its value-chain.

Examples are emissions associated with components sourced from vendors, emissions associated with logistics used for transporting finished products, emissions from business travel by personnel, emissions associated with leased office spaces or stores, and others are covered within this scope. Scope 3 includes all GHG emissions not within Scope 1 and Scope 2.

## 2.2.2. Non-GHG Emissions

Other than gaseous emissions mandated by GHG Protocol, the following emissions are also of interest from a sustainability and air pollution perspective. Some reporting standards, such as BRSR, require disclosure of the quantum of these emissions as well:

(i) NOx – Nitrogen oxides i.e. Nitric oxide (NO), Nitrogen dioxide (NO2)

(ii) SOx – Sulphur oxides i.e. Sulphur monoxide (SO), Sulphur dioxide (SO2), Sulphur trioxide (SO3)

(iii) PM – Particulate matter

(iv) POP – Persistent organic pollutants

(v) VOC – Volatile organic compounds

(vi) HAP – Hazardous air pollutants

These gases do not have emission factors to calculate tCO2e, and hence are reported in absolute quantum, either in tonnes or in litres as appropriate.

### 2.2.3. Water

Water is a key natural resource that is used by every business – either in business operations or for human usage. As such, knowing the quantum of water used, esp. fresh water, is given utmost importance in all sustainability related disclosures and general climate discourse. Some reporting standards further require detailing the source of the water used by the business, as follows:

(i) Surface water

(ii) Ground water

(iii) Sea water

(iv) Any other source

In addition, data on recycled, and water released with or without removal of harmful pollutants is also sought by some standards.

### 2.2.4. Waste

Waste is another key aspect of interest in all sustainability related disclosures and discourse. The typical types of waste that need to be quantified and recorded are:

(i) Plastic waste

(ii) Electronic waste

(iii) Bio-medical waste

(iv) Construction and demolition waste

(v) Battery waste

(vi) Radioactive waste

(vii) Other hazardous or non-hazardous waste

Along with absolute quantum of waste generated, record of the quantum of waste disposed through various means is also relevant. The following data is usually sought:

(i) Recycled

(ii) Reused

(iii) Any other recovery operations

(iv) Incinerated

(v) Taken to landfills

(vi) Any other disposal mechanism

### 2.2.5. Biodiversity

If there is any impact on local biodiversity because of the operations of a business, such data is also sought during disclosures. To provide this data, enterprises have to undertake longitudinal (long-term) assessments of the geographic environment in which their operations exist.

For e.g. has the number of species of flora and fauna in the geographic region surrounding the business operation changed because of its presence. Similarly, if a cement factory is established close to a lake which is a hub for seasonal birds, migrating there during a particular season, beyond commenting on the purity of the water in the lake, the business will also be expected to assess the impact on the pattern of movement of the birds, the number of birds visiting, and other aspects. Another example could be would probability for a land slide increase due to a business operating in the region. These assessments are typically carried out by experts in the particular domain, such as environmentalists, geologists, zoologists or others as needed for the particular context.

As can be seen from the examples, impact can be diverse depending on the nature of the business or product being produced. All such impact data is disclosed in appropriate units or measurement metrics.

## 2.3. Environmental Cost

As seen above environmental impact is specified as the amount (quantity) of gaseous emissions, and impact on natural resources, some in equivalent CO2 terms and others in absolute terms. Environmental Cost is defined as such impact measured in relevant units belonging to any of the five categories of environmental impact discussed in Section 2.2 above.

While this not a cost measured in monetary equivalent (such as INR or USD), the term environmental cost is used to signify the cost on the environment (planet) because of a business conducting its activities. Further, it is easy to see that such environmental cost can be attributed to any human activity not just a business.

## 2.4. Environmental Costing

To be able quantify and report environmental impact of an enterprise, one has to record actual data of emissions, waste and natural resource usage across all of its operations. Environmental Costing is the process of recording such environmental costs, in relevant units for different categories of environmental impact described in earlier section. Diligent environmental costing will enable generation of various disclosure reports with ease, and the data can be used by the enterprise for insights into its own environmental impact and ways of reducing (mitigation of) such impact.

This note provides a framework for such environmental costing regardless of the nature of business or product.

## 2.5. Purpose of Reporting

Given the global focus on limiting climate change, reporting or disclosures, mandated by regulation or voluntarily made by an enterprise, is a measure of assessing the impact (damage) enterprises are causing or not causing to the environment. These disclosures are also pointers for regulators, governments, consumers, society and enterprises themselves to do their bit in protecting our planet and to keep its environment habitable for future generations.

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# 3. Method for Environmental Costing

## 3.1. Activity-based Costing (ABC) Summary

Activity-based Costing is a well-known cost accounting method that assigns costs to products and services based on the activities that go into their production. A typical ABC method involves:

(i) Identification of activities such as product design, machine setup, manufacturing, distribution, others that go into making a product or enabling a service.

(ii) Computing costs associated with each activity.

(iii) Assigning (financial) costs to each activity.

(iv) Use this information to analyse product or service cost and profitability.

ABC has been used by enterprises to improve cost management, set accurate prices, identify activities that need improvement and cut back overhead costs. Here's an example of traditional costing vs. ABC model.

***Table 1 ABC Model***

| | Traditional Costing | ABC Model |
|---|---|---|
| Overhead costs for machine setup | - | 250,000 |
| Volume of machines setup | 1,000 | 1,000 |
| **Overhead cost per setup** | **-** | **250** |
| | | |
| Overhead costs of raw material procurement | - | 3,70,000 |
| Volume of raw material (in kgs) | 45,00,000 | 45,00,000 |
| **Overhead cost per kg of raw material** | **-** | **0.08** |
| | | |
| Total production overhead | 19,00,000 | 19,00,000 |
| Assigned overhead | - | 62,000 |
| Overhead allocated on machine hours | 19,00,000 | 12,80,000 |
| Machine hours | 13,200 | 13,200 |
| **Overhead cost per machine hour** | **14.39** | **9.70** |

## 3.2. Life cycle Costing (LCC)

Life cycle Costing is a method of calculating the total cost of a product or service over its lifetime. It is also referred to as cradle-to-grave costing at times. LCC is a process of economic analysis that considers all costs associated with an asset, from initial cost to the end of its life. This costing includes purchase costs, maintenance costs, operational costs, financing costs, depreciation costs and associated end-of-life costs.

LCC is typically used to compare alternative projects and their externalities. For example, when deciding whether to buy Car A vs Car B (an electric vehicle), LCC can help consider the purchase price, operating costs, maintenance costs, resale value and other parameters of interest.

***Table 2 LCC Model***

| | | Car A | Car B |
|---|---|---|---|
| **Acquisition** | On-road cost | 18,29,185 | 18,08,552 |
| | Refuelling cost (per km) | 3.63 | 1.3 |
| **Operations** | Insurance (per year) | 69,798 | 61,988 |
| | Tolls payable (per year) | 36,000 | 0 |
| | Maintenance cost (per year) | 20,000 | 12,000 |
| **Disposal** | Resale value | 15,00,000 | 14,00,000 |

## 3.3. The Holistic Environmental Costing (HEC) Framework

To completely assess the environmental impact of a business, it is necessary to consider the entire lifecycle of the business's offering (product or service), and to capture the environmental impact of each of the activities involved throughout such lifecycle. This approach, built as a hybrid of lifecycle costing (LCC) and activity-based costing (ABC) described above, is what is called Holistic Environmental Costing (HEC). This approach ensures every potential aspect of environmental impact emanating from a business, and its operations thereof, is captured.

HEC can be undertaken in three steps:

(i) Lifecycle mapping

(ii) Activity-based break-down

(iii) Assigning environmental costs to each activity

### 3.4.1. Lifecycle Mapping

A product or service offered by a business goes through multiple stages in its lifecycle. Depending on the nature of the product or service, one or more of the following stages in its lifecycle will become relevant for environmental impact analysis. Figure 2 is a generic depiction of a lifecycle of a product or a service.

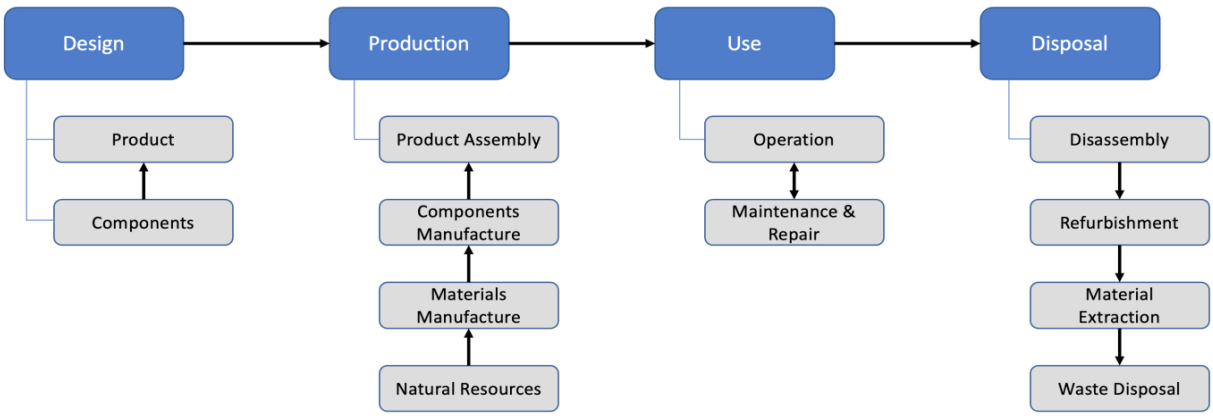


***Figure 3 Generic Lifecycle***

The four key stages viz. Design, Production, Use and Disposal are further broken down into sub-aspects within each stage that need to be considered. Depending on the product, the stages or sub-aspects in these stages might change, hence this is being used as a generic, not prescriptive depiction.

**Design**

Design of a product (or service) is the first stage where decisions can be taken on multiple aspects of interest from an environmental impact perspective. A designer might seek to ensure the product in itself has minimal impact on the environment, for e.g. energy efficient refrigerators in the case of a product or energy efficient computation in case of a software service. Or a designer might want to use only recycled raw material in the product, for e.g. by using recycled instead of virgin plastic to reduce its environmental cost by-design.

If a product or service uses components, for e.g. automobiles are assembled using numerous components, or a software application might use digital services from different organizations, the designer of the product can choose to use only environmentally friendly components in their product.

Further, design-for-repair or design-for-reuse are growing concepts in Industrial Product Design. They emphasise on minimizing the need for a customer or consumer to replace

a product in its entirety due to a fault in one of its components by making repair easy, and also designing the product in a way that at its end-of-life (disposal stage) maximum materials used in the product can be recovered or reused as is to make newer products.

The business, who owns the product or service can also influence such component vendors or suppliers to ensure their products or offerings are environmentally friendly, especially if it's a large market player, and a key customer of its vendors or suppliers.

While the actual environmental impact of Design as a business operation in itself might be minimal, for e.g. a design team may only use a few computers to design the product, where the environmental impact is largely limited to the energy consumed by these computers, a deeper understanding of this stage is of great value in engaging in conversations around reduction of environmental footprint in the later stages of the lifecycle.

**Production**

In a typical product or service lifecycle, production or manufacturing or deployment is the stage where the environmental impact generation is significant. The sub-aspects relevant in this stage are assembly, components manufacture, materials manufacture and natural resource extraction. As in Figure 3, the idea is to dig deeper into this stage, breaking down each aspect into production or manufacture of its constituents, down to the origin of natural resources used in the product or in making the raw materials needed.

This stage is where the environmental impact may go outside the operational boundary of a business, i.e. since most businesses rely on third party suppliers or vendors for components and sub-components, the environmental impact is not directly within the remit of their scope of operations. However, in the context of understanding the holistic environmental impact of the product or service, this deep-dive becomes relevant.

**Use**

The environmental impact of a product or service during its usage is of interest in this stage. For e.g. gaseous emissions from automobiles, while the automobile manufacturer may not consider such emissions as their own, the business along with the consumer are jointly responsible for the environmental impact the automobile has. The business could have designed a product which has minimum harmful emissions, or the customer could have chosen an automobile with a lower emission footprint. Some reporting standards require businesses to report this environmental impact as well.

Further, tying into design-for-repair, maintenance of a product may lead to environmental impact. Replacing a component in a product or repairing a damaged product and such aspects need to be assessed from an environmental impact perspective.

**Disposal**

With the concept of Circular Economy gaining popularity across industries, analysis of this stage is becoming critical in the lifecycle. The various sub-aspects shown in Figure 3, viz. disassembly, refurbishment, material extraction, waste disposal, as operations themselves may add to the environmental impact in the product lifecycle. However, in doing so, the net result is a potential reduction in the environmental impact by taking away the need for a new or virgin product or component or raw material to be used for a new product, thereby creating a net positive impact on the environment. Government regulations such as Extended Producer Responsibility (EPR) are a good example of how businesses are being pushed towards actions in the circularity space.

Also disposal of waste, if emerging from production operations, or from scrapping end-of-life products is also a closely monitored aspect of environmental impact. Pollution control norms, EPR regulations and other such policy measures address this aspect. Relevant agencies implementing these policies seek such data on a periodic basis .

Mapping activities under these four stages viz. design, production, use and disposal, and defining which among these fall within the remit of a business is the first step towards internalizing HEC. While not all stages or sub-aspects of a stage might be under the control of a business, all of them are relevant from a product lifecycle perspective. Best efforts need to be made in collating all such information possible, given these could have a significant Scope 3 GHG emissions or environmental impact as a whole of the product.

## 3.4.2. Activity-based Break-down

The stages and the sub-aspects detailed during Lifecycle Mapping, need to be broken down to a machine or individual activity level to gain insight into the environmental impact being generated by each activity. The following is an example of such activity-based breakdown effort.

Let us assume a business makes biscuits. In the lifecycle of the biscuit, this business is responsible for production stage, and relevant sub-aspect, say, manufacturing. Figure 4 is a generic depiction of how biscuits are made.

Dough mixing, fermentation, moulding, baking, cooling and packaging are various 'Level I' activities undertaken in making biscuits. However, each top-level activity can be further broken down into sub-activities, which use a machine or tool, given this is a manufacturing process. It is now necessary to further break-down each Level I activity into relevant machine or tool (equivalent) activity, designated as Level II, as needed.

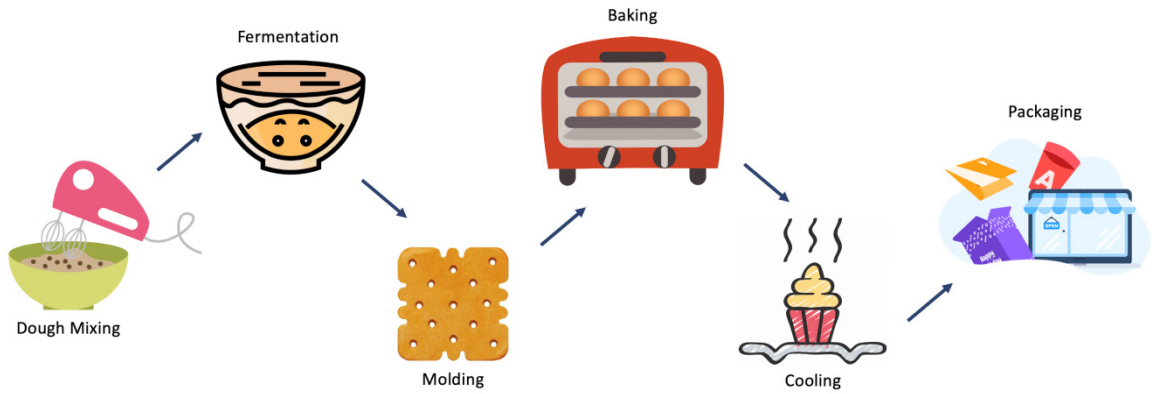


*Figure 4 Generic Biscuit Making Level I Activities*

Figure 5 is a depiction of such break-down for the biscuit making process shown above. Note in Level II, we identify the individual machines on which activities are taking place, rather than simply taking note of the activity itself. The need for this will become apparent very soon.

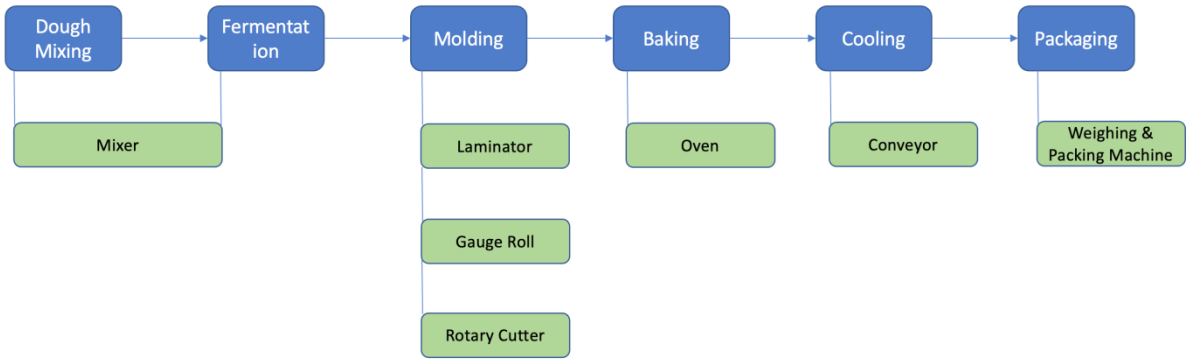


*Figure 5 Level II Activity Break-down for Biscuit Making*

As can be seen, some Level I activities use the same machine, such as Dough Mixing and Fermentation happen in the same machine – a Mixer. Others such as Moulding involve activities on multiple machines, viz. Laminator, Gauge Roll and a Rotary Cutter.

This Level II break-down is the foundation for understanding the environmental impact of a biscuit making operation. It is easy to grasp that the impact on the environment actually happens because of the operation or usage of these machines. The logical next step is to understand what environmental footprint is generated at each machine, i.e. Level II activity.

### 3.4.3. Assigning Environmental Costs

Before one can assign environmental costs to Level II activities at each machine or tool, it is important to identify which input or output of this activity has an environmental impact. As discussed before, environmental footprint has multiple categories viz.:

(i) GHG Emissions

(ii) Non-GHG Emissions

(iii) Water

(iv) Waste

(v) Biodiversity

Each input or output from a Level II activity has to be analysed under these lenses for assigning an environmental cost, whether in tCO2e or relevant units.

Continuing with the biscuit manufacturing example, Figure 6 showcases the elements (input or output) of interest at each Level II activity from an environmental perspective.

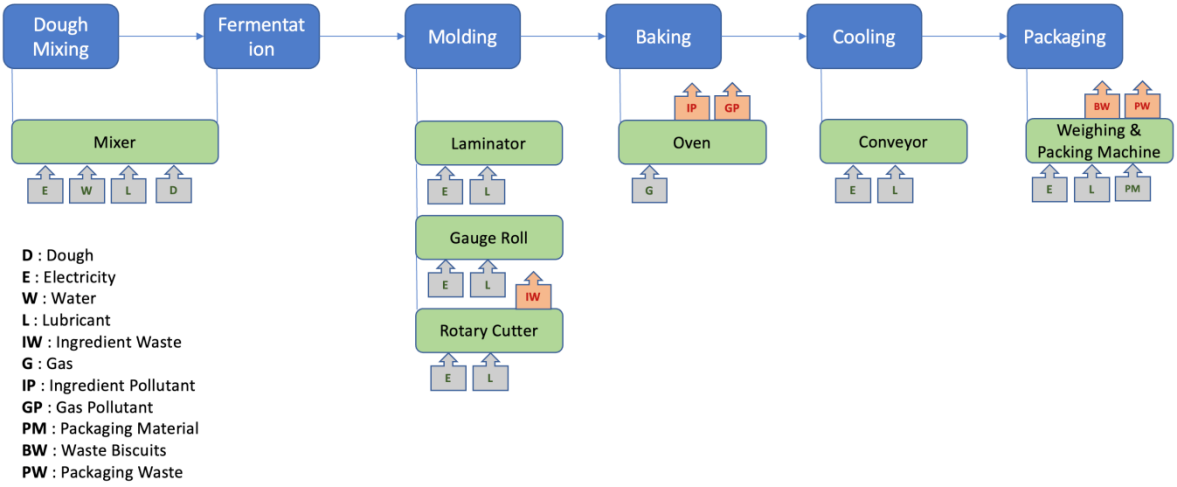


***Figure 6 Identifying elements to assign Environmental Costs***

Please note, the raw materials used in making the biscuit, flour, salt, sugar, any additives are shown simply as 'Dough' in Figure 6. A brief description of some elements identified follows, and the reason for considering them in this analysis follows.

**Mixer**: Electricity and water consumed are obvious elements of interest. However, the lubricant used for smooth operation of the Mixer is also relevant as it is usually a by-product of oil refining, and hence can add to the overall (indirect) environmental impact.

**Rotary Cutter**: During this operation, when the dough is cut into shapes to form the biscuits, some dough is wasted. Depending on the chemical composition of the ingredients used in the dough, this waste, and its unsafe disposal could lead to environmental harm or hazard. Thus this is an added element of interest as well.

**Baking**: During baking, it is possible for some of the chemical additives in the biscuit dough evaporate, and become part of the emissions from the oven. Further, there's always a possibility of fugitive emission of compressed gas being used as fuel. Hence, these elements are of interest from an environmental footprint perspective.

**Packaging**: The Packaging Material, usually accounted for under Scope 3 GHG emissions, is shown as it is not an ingredient that goes into making the biscuit. There's also a possibility of packaging materials and some biscuits going waste for many reasons. Safe disposal of let's say packaging waste, if plastic is being used, and biscuits are also aspects of interest from an environmental impact perspective.

For each of the elements identified, assigning environmental costs would mean either deriving the equivalent tCO2e for GHG emissions, or quantifying the others in absolute units as relevant. The elements identified, from a reporting standpoint, can be sorted into categories as shown in Table 3, making it a useful foundation for all reporting needs.

*Table 3 Environmental Report*

| Level I | Level II | GHG Gases | | | Non GHG Gases | Water | Waste | Biodi-versity |
|---|---|---|---|---|---|---|---|---|
| | | Scope 1 | Scope 2 | Scope 3 | | | | |
| Dough Mixing | Mixer | | E | D, L | | W | | |
| Fermentation | | | | | | | | |
| Moulding | Laminator | | E | L | | | | |
| | Gauge Roll | | E | L | | | | |
| | Rotary Cutter | | E | L | | | IW | |

| Level I | Level II | GHG Gases | | | Non GHG Gases | Water | Waste | Biodi-versity |
|---|---|---|---|---|---|---|---|---|
| | | Scope 1 | Scope 2 | Scope 3 | | | | |
| Cooling | Conveyor | | E | L | | | | |
| Packaging | Weighing & Packaging machine | | E | L, PM | | | PW, BW | |

Further, for each of the elements identified, it would be worthwhile to also identify the source or destination for the element, source in case of an input and destination in case of an output. For e.g. energy the source could be grid energy or energy sourced from a solar farm i.e. renewable energy. Similarly, for gas pollutant the destination is the atmosphere as it may be simply let out or may be a pre-treatment/catalytic chamber or for ingredient waste the destination could be a landfill. This data gives further insight into the elements that are responsible for the environmental footprint, and in some cases such as BRSR, will help in reporting as well.

Table 3 provides an abstract view of the entire production operation and reflects where, what type of environmental footprint is generated. This view enables a business to understand their environmental footprint in the context of their own operations in an easy manner.

To assign environmental costs and to capture all relevant information in a single place for later use, Table 4 is the suggested format for environmental cost of GHG emissions.

*Table 4 GHG Emissions Environmental Cost*

| <Level II Activity Name> - GHG Emissions Environmental Cost | | | | | | |
|---|---|---|---|---|---|---|
| Scope | Gas | Qty | Unit | Emission Factor | tCO2e | Source / Destination |
| 1 | CO2 | | | | | |
| | CH4 | | | | | |
| | N2O | | | | | |
| | HFCs | | | | | |
| | PFCs | | | | | |
| | SF6 | | | | | |
| | NF3 | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Total tCO2e** | | | | | | |
| **2** | CO2 | | | | | |
| | CH4 | | | | | |
| | N2O | | | | | |
| | HFCs | | | | | |
| | PFCs | | | | | |
| | SF6 | | | | | |
| | NF3 | | | | | |
| **Total tCO2e** | | | | | | |
| **3** | CO2 | | | | | |
| | CH4 | | | | | |
| | N2O | | | | | |
| | HFCs | | | | | |
| | PFCs | | | | | |
| | SF6 | | | | | |
| | NF3 | | | | | |
| **Total tCO2e** | | | | | | |

Table 5 is the suggested format for capturing non-GHG emission environmental cost.

*Table 5 Non-GHG Emissions Environmental Cost*

| **<Level II Activity Name> - Non-GHG Emissions Environmental Cost** | | | |
|---|---|---|---|
| **Gas** | **Qty** | **Unit** | **Source / Destination** |
| NOx | | | |
| SOx | | | |
| Particulate Matter (PM) | | | |
| Persistent Organic Pollutants (POP) | | | |
| Volatile Organic Compounds (VOC) | | | |
| Hazardous Air Pollutants (HAP) | | | |

Table 6 is the suggested format for capturing waste related environmental costs.

*Table 6 Waste Environmental Costs*

| <Level II Activity Name> - Waste Environmental Cost | | | |
|---|---|---|---|
| **Type of waste** | **Qty** | **Unit** | **Source / Destination** |
| Plastic waste | | | |
| E-waste | | | |
| Bio-medical waste | | | |
| Construction and Demolition waste | | | |
| Battery waste | | | |
| Radio-active waste | | | |
| Other non-hazardous waste | | | |
| Other hazardous waste (if any) | | | |

For HEC, Tables 4, 5 and 6, have to be created for all sub-aspects of each stage viz. design, production, use and disposal. The combined data from all such tables is the true HEC of a business from an environmental impact perspective.

Note that 'biodiversity', while is part of the environmental impact, needs an extensive assessment, usually done by expert third parties, and the footprint will depend on the nature of impact. The impact could be in terms of increase or reduction of ground-water table over time, increase or decrease in content of a particular chemical in soil, reduction or increase in bio-diversity in the surrounding region, increase or decrease of habitable region for animals, and others. While potential impact can be assessed before-hand by experts, there could be a need for longitudinal studies (studies conducted over a longer period time, typically in years) to know the true impact. As such this aspect of environmental impact is left open-ended from an environmental cost capture perspective, as it is contextual to the nature of a business.

While the above description is a generic one, assuming a product that is manufactured and its simplified lifecycle, the more detailed the lifecycle mapping of a business the better it is. For e.g. post-production, there could be an additional 'sales' stage, where the product is shipped to warehouses, retail stores or customer sites. This lifecycle mapping is contextual to the nature of the business.

Additionally, while the focus is on product, in cases such as IT companies, the environmental impact of their offices themselves can be significant. For complete environmental impact assessment of a business, it is necessary to include footprint of all office facilities as well. This, along with impact of movement of personnel for business travel, etc. are covered under Scope 3 of GHG. Beyond GHG, these operations will also have an impact on water and waste footprint, and hence start becoming relevant. A similar analysis, as described above, suited for office facilities can be carried out as well.

## 3.5. Benefits of HEC

HEC method allows for 360-degree analysis of a business from an environmental impact standpoint. This comprehensive analysis has multiple benefits as outlined below.

### 3.5.1. Granularity

HEC provides details of environmental impact in a bottom-up fashion, ensuring each activity of the business and the business offering's lifecycle are accounted for. This granularity can provide deep insights to a business on how it is impacting the environment while conducting its business. For businesses looking to develop mitigation strategies, this data is invaluable as they can then confidently identify best areas of action to reduce their environmental impact.

HEC led granularity also has the benefit of being almost a forensic audit from an environmental impact perspective. As such the data captured has multiple benefits not just for business decision-making, but to provide needed transparency into environmental data provided. Any concerns of green washing from any stakeholder can be addressed by providing them the right data points to allay their fears.

### 3.5.2. Assurance & Verification

Similar to financial records, HEC provides a detailed record of environmental impact tied into actual activities within a business. Since a record of every activity and its associated environmental cost is captured, assurance of data happens by design in the HEC method. Further, any third party verification will also accentuate the quality of environmental data recorded by a business using the HEC method.

### 3.5.3. Ease of digitization

Leveraging any existing automation for data capture of elements such as electricity, water, the data needed under HEC can be easily captured. Even if such automation

doesn't exist, it is possible to create simplified data collection SOPs for business personnel to periodically record needed data, given they tend to do such data collection in some form or the other already. This data capture can be easily digitised with basic data entry software applications.

### 3.5.4. Enhanced Risk Assessments

Climate change and its impact on a business are key areas of risk assessment today. The HEC derived environmental cost provides valuable insights into risk assessments of a business and its ecosystem from a climate change standpoint. Decision-making becomes fact or data-led making enhancing effectiveness of such assessments and actions taken thereof.

■

# 4. Usage of HEC and Data Produced Thereof

HEC can enable multidimensional perspectives of relevance to the business, and overall management of environmental footprint. The usage of environmental costing data can be mapped onto three layers of relevance from a business perspective as follows:

(i) Operations Layer

(ii) Management Layer

(iii) Reporting Layer

Figure 7 showcases these layers and the value they bring to a business, and how the value starts accruing.

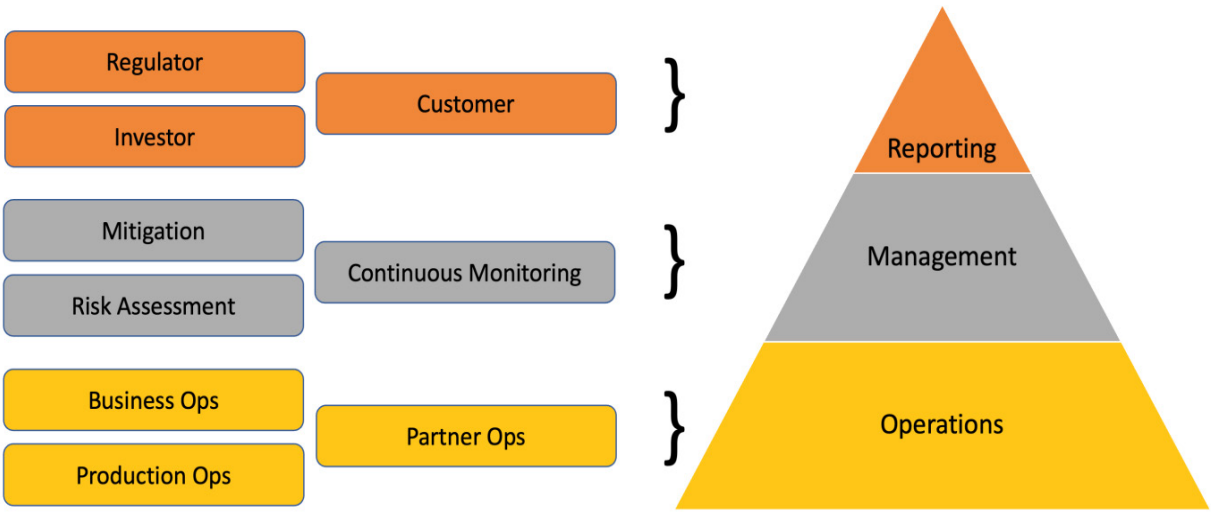


*Figure 7 HEC-enabled Management Layers*

## 4.1. Operations Layer

### 4.1.1. Production Ops

HEC, as described in Section 3 above, enables detailed mapping of business operations and their associated environmental impact, as reflected in their environmental cost. The granularity of the data from HEC, provides deep insights into production operations and helps a business analyse where and how the environmental impact is being generated. Having mapped the entire lifecycle for HEC, it is now possible to know what is happening

at any step or stage in production operations. Thus, environmental costing of production operations is the foundation for any action to both report current environmental impact, and to seek ways of mitigating the same.

Additionally, environmental costing can also provide a different perspective from an operational efficiency stand-point. A simple example is, if the environmental costing exercise shows that the consumption of lubricant over a year is 100litres, but 120liters was procured, one might want to find out where there's a wastage.

### 4.1.2. Business Ops

HEC ensures one maps out all activities undertaken for running the business for e.g. running office facilities, business travel, logistics, warehousing, retail, advertising, etc. As with production operations, this wealth of data acts as a baseline for reporting and mitigation actions.

Additionally, mitigation action can also benefit the organization by seeking ways of making the operations efficient or lean themselves. For e.g. a business might decide to enable hybrid working, i.e. partial work-from-home for personnel in non-critical functions. Such action can have multiple benefits from both an environmental impact perspective, i.e. reduced need for office facilities to be operational, reducing need for personnel to travel to office, and while giving personnel a better work-life balance.

### 4.1.3. Partner Ops

Regulations globally are mandating Scope 3 GHG reporting from supply-chain partners. As such HEC, at least to the extent of deriving environmental cost of production or service provided by partners, should be undertaken. This data allows a business to understand the effect partners activities and operations are having on its own environmental impact. Businesses may then choose to recommend actions to partners to reduce their environmental impact or decide which partner to choose or prioritize over other partners.

Overall, the operations layer is a window into where, how and how much is the environmental impact of a business. HEC enables this through its hybrid lifecycle and activity-based environmental impact measurement approach. Businesses prefer having data at-hand that provides a true picture, and the HEC approach enables maximum transparency at the operations level. This as-is measurement of environmental impact from existing operations is also referred to as the Baseline analysis.

## 4.2. Management Layer

HEC of the operations creates the Operations Layer that is the baseline for action towards reducing the environmental impact of their operations. Before any action is taken, using the baseline data, businesses would want to undertake a risk assessment of how climate change might affect the business itself, and put that in perspective with respect to the operations. Figure 7 showcases a typical risk assessment framework that encompasses risk assessment, mitigation and continuous monitoring.

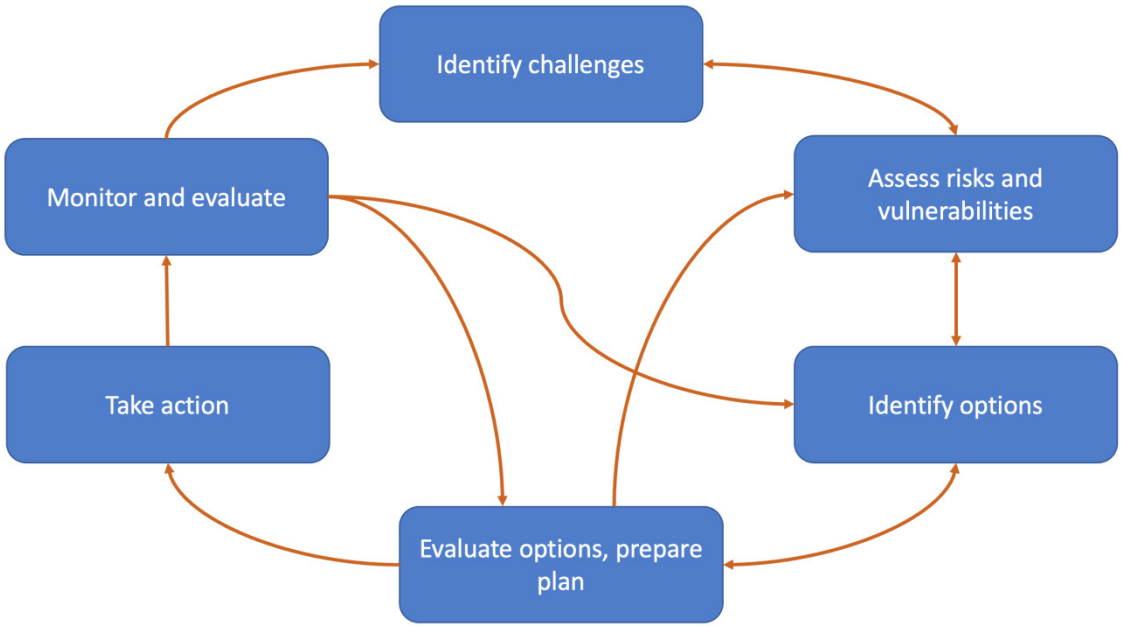


*Figure 8 Typical Risk Assessment Framework*

### 4.2.1. Identify challenges

HEC allows a business to identify the dependency on natural resources in their operations, not just in-house but in its partner ecosystem as well. Climate change can affect business in various ways for e.g. floods, droughts, wild fires, increased need for refrigeration or air-conditioning, and more will have an impact on the business. Correlating HEC data with contextual climate realities, will help a business identify the right challenges to its operations.

### 4.2.2. Assess risks and vulnerabilities

A quantitative and qualitative assessment impact of the identified challenges on the business can be carried out. HEC data helps by providing the basis and baseline for extrapolation of any risk scenario, and its impact on business.

### 4.2.3. Identify options

From the risk assessment perspective , various options to mitigate impact can be identified, and appropriate execution strategies may be developed. Such design usually involves identification of resources need (financial, non-financial), technologies, skills and other relevant aspects as well.

### 4.2.4. Evaluate options, prepare plans

Business decisions are rarely straight-forward yes or no decisions based on just one metric. A compound function of business metrics such as capital needed, impact on productivity, market readiness, customer-demand, technology availability, and others will be part of the mix for taking decisions on a mitigation strategy. Figure 9 is a diagrammatic representation for such a decision making matrix. In this example, the business may decide to act on activities P1 and P3.

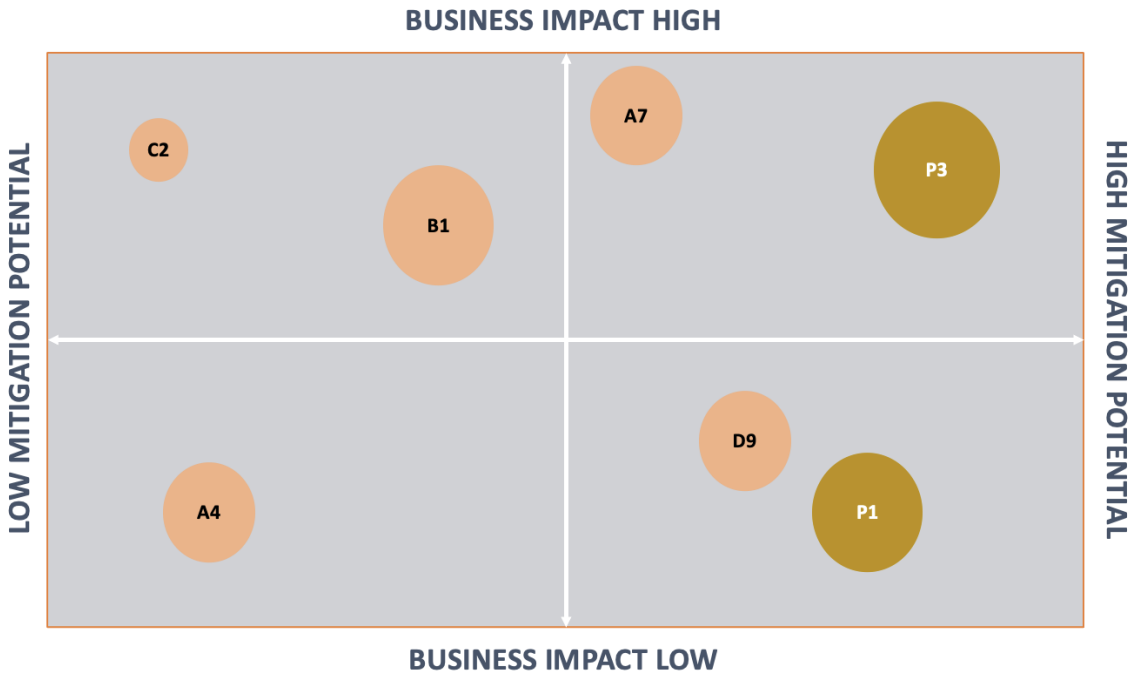


*Figure 9 Mitigation Decision Matrix*

The business will then proceed to plan for execution of these mitigation paths. In the process there might be a need to modify the elements of interest identified (please see Section 3.4.3) to bring in newer elements. For e.g. instead of a liquid coolant (chemical), if the business decides to use water as a coolant during a welding operation, the environmental impact elements of interest will change appropriately.

### 4.2.5. Take action

The business then goes on to executing the plans generated.

### 4.2.6. Monitor, evaluate

While monitoring execution of implementation, continuous HEC data allows the business to evaluate efficacy of the mitigation strategy against the baseline data captured previously. The process then repeats with feedback from some stages going into others are shown in Figure 8. HEC data becomes a powerful resource in this entire process. A business, thus has a great handle on managing the entire mitigation process using HEC.

## 4.3. Reporting Layer

Reporting enabled by HEC can be leveraged for various aspects by the enterprise. The structured nature of HEC makes it easy to compute or present relevant perspectives of environmental cost (impact) data to any stakeholder with minimum effort. Multiple avenues enabled by using HEC data are detailed below.

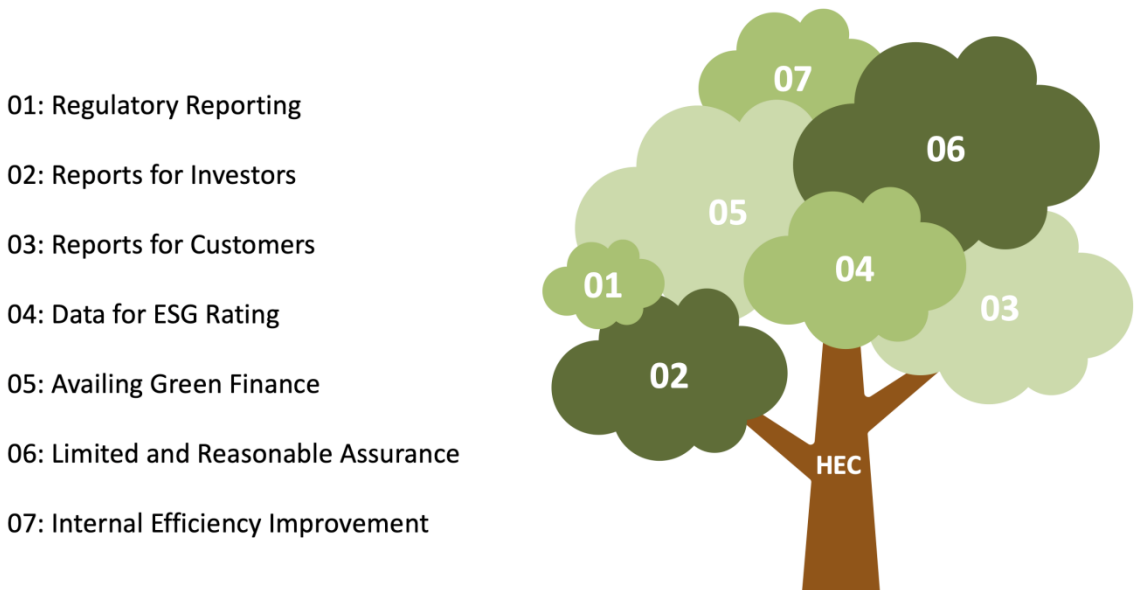


*Figure 10 Reporting aspects seamlessly enabled by HEC*

### 4.3.1. Regulatory reporting

ESG reporting was previously voluntary, but today is increasing mandated by regulators, investors, and sometimes customers worldwide. SEBI has had a BRSR reporting mandate for the top 1,000 listed companies (by market cap) since FY 22-23 in India. From FY 25-26, this mandated has been extended to 75% of the value chain of the top 1,000 listed companies.

Similarly, the European Union, has mandated disclosures for companies under Corporate Sustainability Reporting Directive (CSRD). Other countries such as Japan, Brazil, Singapore, US and a growing number of countries are mandating some form of environmental footprint.

There are also voluntary reporting standards that have gained popularity, and are widely accepted globally such as Carbon Disclosure Project (CDP), Global Reporting Initiative (GRI), International Sustainability Standards Board (ISSB), Taskforce on Nature-related Financial Disclosures (TNFD) and others. Regulatory reporting standards globally have been typically built on these voluntary norms.

All of the above are standardised reporting formats which are typically sector-agnostic. The HEC method captures environmental impact data that can be easily used to comply with any of the standard reporting formats, which generally use a subset of the five categories of environmental impact noted earlier. Table 3 (please section 3.4.3) ensures environmental costs are captured in a manner making computation of data for any reporting easy.

### 4.3.2. Reports for investors

Investors – equity investors, creditors, and other financial institutions sometimes may have custom reporting formats and requirements. These reports may not only include absolute environmental impact data, but could seek derivative metrics such as revenue carbon intensity (i.e. total GHG emissions / total revenue) or any other metric of interest to them. HEC enables such computations with ease as environmental costs are neatly categorized and readily available.

### 4.3.3. Reports for customers

Imagine a customer wants to know the environmental footprint of the cup of coffee one is consuming at a coffee shop. If HEC had been undertaken for the coffee shop,

as a business, it will be possible to give the customer that number. Similarly, if consumers want to know the environmental impact of taking a flight from Mumbai to Delhi, HEC of the airline, down to operating the particular aircraft in this case, divided over the number of passengers (occupancy rate of the flight), could give us the number.

HEC thus enables, creating reports for customers and any other customized report the business needs to satisfy any stakeholder.

### 4.3.4. Data for ESG rating

ESG focused funds are steadily increasing in number in the financial markets. With such funds seeking to which enterprises are performing better on ESG parameters, ESG Rating of an enterprise has become widely prevalent, both in Indian and global markets. To undertake the rating, such agencies seek a variety of data points from enterprises. HEC enables easy and transparent computation of such data from an environmental impact perspective. A good ESG rating leads to an enterprise being able to command a premium space in the financial markets.

### 4.3.5. Availing green finance

Green finance, i.e. finance for enterprises to undertake environment-friendly actions, such as mitigation of energy footprint, or environmental impact of production or any other aspect of business, is the new instrument of choice for businesses. HEC enables good ESG ratings, as well as assuring green finance providers of:

(i) Validity of green finance proposal in the context of the enterprise – using the baseline data from HEC an enterprise can showcase how, with green finance, it plans to mitigate its environmental impact

(ii) Continuous monitoring of agreed KPIs for the green finance proposal

(iii) Closure of green finance at the end of its term with factual data to prove the intended mitigation effort was a success

Green finance, with its better terms of financing, is a very attractive instrument for enterprises to raise needed capital not just for mitigation activities, but the capital can be dovetailed with operations to scaleup or undertake efficiency improvement projects for maximum benefit to the enterprise.

## 4.3.6. Limited and reasonable assurance

Regulators and other agencies mandating environmental footprint reports are beginning to seek assurance of data reported by businesses. Assurance essentially means that a third party (independent) has verified the data reported and ratifies that the data is accurate.

Assurance however has two forms as described below:

**Limited assurance**

A less rigorous review of data presented, without extensive testing or evaluation is called limited assurance. The assuring agency limits its review to data completeness and if needed interviews with few relevant personnel of the business to satisfy itself that the data reported is accurate. The interpretation is also contextual with different connotations in financial, legal, environmental and other forms of assessments.

**Reasonable assurance**

Reasonable assurance on the other hand is a deeper, more rigorous evaluation of data presented. For e.g. end of year financial audits provide reasonable assurance, as the reviewer or assuring agency scrutinizes data reported in detail, to highlight any discrepancies. From an environmental reporting perspective as well, reasonable assurance will need to the follow the same rigor as financial audit. In such a scenario, data captured using HEC method becomes the true source of information, making assurance easy.

## 4.3.7. Internal efficiency improvement

HEC undertakes comprehensive mapping of the resources utilized by the enterprise. While the primary purpose of HEC is to assess the environmental cost (impact) of a business, the same data can be used by the enterprise in multiple ways to enhance process and resource efficiency. For e.g. wastage or leakage of resources procured will be visible by tallying quantity of resources paid for vs. actually consumed by a business in its operations. Computing intensity metrics against production of different batches of the same product or for offering similar services to different customers can help in identifying areas for process improvements. The avenues for efficiency enhancement can be many, and enterprises can use HEC data with confidence, as is the case with 'assurance' discussed in 4.3.6.

# 5. BRSR

Business Responsibility and Sustainability Reporting (BRSR) is the reporting format mandated by Securities Exchange Board of India (SEBI) for ESG reporting of top 1,000 listed companies as of 2024. The format includes indicators of all three aspects of Environment, Social and Governance (ESG). The HEC method helps us address the environment focused reporting needs of this format.

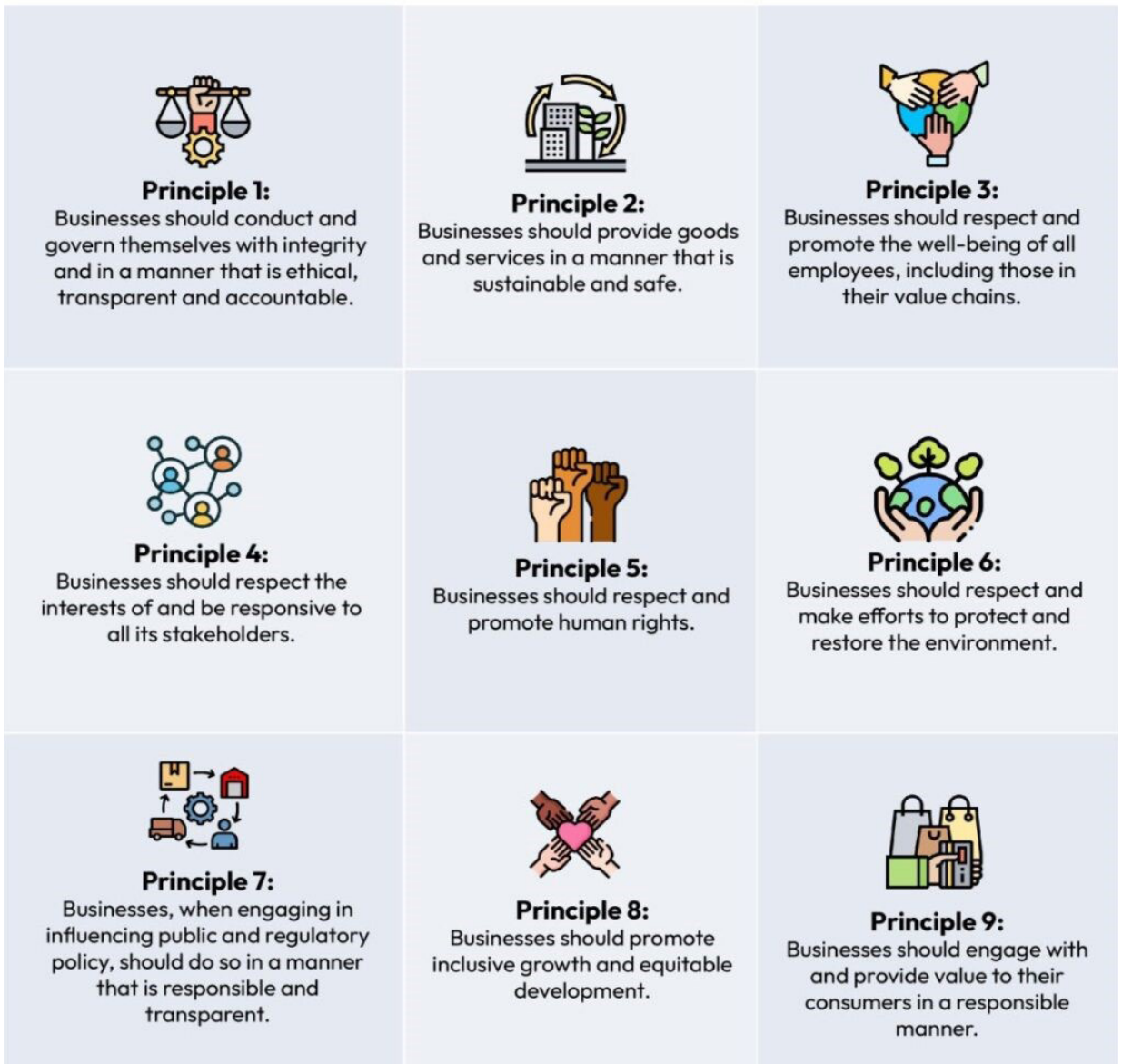


*Figure 11 Principles of BRSR*

BRSR, as shown in Figure 9, is a combination of 9 principles. Of these, Principle 6, which expects businesses to respect and make efforts to protect and restore the environment is the one relevant for us here.

Further, BRSR has multiple indicators (metrics) under each principle. These indicators are further divided into essential indicators and leadership indicators.

**Essential indicators**

Essential indicators are those that need to disclosed by every entity that is mandated to report by regulation in the BRSR format.

**Leadership indicators**

In contrast leadership indicators are voluntary indicators. A business may choose to report on these indicators to establish that they aspire to become leaders and set higher benchmarks. Given BRSR reports are public, businesses may choose to act and report on leadership indicators which will make investors more interested in the company, as a better than average performer, and also for increased brand value in general public.

The following sections detail the indicators as per latest (at the time of this document) notification issued as SEBI/HO/CFD/CFD-SEC-2/P/CIR/2023/122 on July 12, 2023. Readers are advised to validate the information below against any latest updates.

## 5.1. Assurance

Assurance, is optional, but is a recurring query against all data reported in this principle. Assurance has to be undertaken by an external entity, and limited or reasonable assurance both are acceptable. However, to take away any doubt in minds of the stakeholders, with respect to authenticity of data being reported, it is advisable for a business to undertake reasonable assurance as it is more rigorous in nature. As noted earlier HEC prepares the business for any kind of assurance.

## 5.2. Principle 6 – Essential Indicators

### 5.2.1. Q1 – Details of energy consumption

*Table 7 Principle 6 Essential Indicator - Question 1 – Energy consumption data*

| Parameter | Current FY | Previous FY |
|---|---|---|
| **From renewable sources** | | |
| Total electricity consumption (A) | | |
| Total fuel consumption (B) | | |
| Energy consumption through other sources (C) | | |
| **Total energy from renewable sources (A+B+C)** | | |

| From non-renewable sources | | |
|---|---|---|
| Total electricity consumption (D) | | |
| Total fuel consumption (E) | | |
| Energy consumption through other sources (F) | | |
| **Total energy from non-renewable sources (D+E+F)** | | |
| **Total energy consumed (A+B+C+D+E+F)** | | |
| **Energy intensity per rupee of turnover** (Total energy consumed / Revenue from operations) | | |
| **Energy intensity per rupee of turnover adjusted for purchasing power parity (PPP)** (Total energy consumed / Revenue from operations adjusted for PPP) | | |
| **Energy intensity in terms of physical output** (Total energy consumed / Quantity of goods produced or services offered) | | |
| Energy intensity (optional) – any metric selected by the business | | |

This question pertains to energy consumed by the organization. As seen in Table 6, along with the quantum of energy consumed, there's a need to identify the source of the energy as highlighted before. HEC takes this into account.

Also, as noted earlier HEC at the activity level enables a business to dig deeper into efficiency of energy utilization if they wish to.

### 5.2.2. Q3 – Details of water consumption

*Table 8 Principle 6 Essential Indicator - Question 3 – Water consumption data*

| Parameter | Current FY | Previous FY |
|---|---|---|
| **Water withdrawal by source (in kilolitres)** | | |
| (i) Surface water | | |
| (ii) Ground water | | |
| (iii) Third party water | | |
| (iv) Seawater / desalinated water | | |
| (v) Others | | |
| **Total volume of water withdrawal (i+ii+iii+iv+v)** | | |
| **Total volume of water consumption (in kilolitres)** | | |
| **Water intensity per rupee of turnover** (Total water consumed / Revenue from operations) | | |

| | | |
|---|---|---|
| **Water intensity per rupee of turnover adjusted for purchasing power parity (PPP)** (Total water consumed / Revenue from operations adjusted for PPP) | | |
| **Water intensity in terms of physical output** (Total water consumed / Quantity of goods produced or services offered) | | |
| Water intensity (optional) – any metric selected by the business | | |

This question pertains to water consumption. Note the distinction between water withdrawal and water consumed. It indicates that the business has to be conscious of only withdrawing the amount that it actually consumes for operations, without any wastage prior to consumption or usage. Here HEC captures accurate detail of the water actually consumed by the business across all operations. Water withdrawal can be an additional aspect measured during HEC depending on the nature of the business and its reporting needs.

### 5.2.3. Q4 – Details of water discharged

*Table 9 Principle 6 Essential Indicator - Question 4 – Water discharge data*

| Parameter | Current FY | Previous FY |
|---|---|---|
| **Water discharge by destination and level of treatment (in kilolitres)** | | |
| (i) To surface water | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| (ii) To ground water | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| (iii) To sea water | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| (iv) Sent to third parties | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| (v) Others | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| **Total water discharged (in kilolitres)** | | |

This question deals with water discharged, that is waste water from any operation or activity or human usage. While the HEC may have captured the destination, as mentioned earlier, it may or may not have captured the detail on level of treatment. For the purpose of reporting under this principle, if necessary, the data captured under HEC needs to be extended to include relevant additional information as well.

### 5.2.4. Q6 – Details of non-GHG emissions

*Table 10 Principle 6 Essential Indicator - Question 9 - Non-GHG emissions*

| Parameter | Specify unit | Current FY | Previous FY |
|---|---|---|---|
| NOx | | | |
| SOx | | | |
| Particulate matter (PM) | | | |
| Persistent organic pollutants (POP) | | | |
| Volatile organic compounds (VOC) | | | |
| Hazardous air pollutants (HAP) | | | |
| Others please specify | | | |

HEC captures this data, hence simple addition of relevant data (in relevant units) for each of these gases provides the information needed to be reported here.

### 5.2.5. Q7 – Details of GHG emissions

*Table 11 Principle 6 Essential Indicator - Question 7 - Scope 1 & Scope 2 GHG emissions data*

| Parameter | Unit | Current FY | Previous FY |
|---|---|---|---|
| **Total Scope 1 emissions** (breakup of GHG into CO2, CH4, N2O, HFCs, PFCs, SF6, NF3 if available) | tCO2e | | |
| **Total Scope 2 emissions** (breakup of GHG into CO2, CH4, N2O, HFCs, PFCs, SF6, NF3 if available) | tCO2e | | |
| **Total Scope 1 & Scope 2 emission intensity per rupee of turnover** (Total Scope 1 & Scope 2 emissions / Revenue from operations) | | | |
| **Total Scope 1 & Scope 2 emission intensity per rupee of turnover adjusted for purchasing power parity (PPP)** (Total Scope 1 & Scope 2 emissions / Revenue from operations adjusted for PPP) | | | |
| **Total Scope 1 & Scope 2 emission intensity in terms of physical output** (Total Scope 1 & Scope 2 emissions / Quantity of goods produced or services offered) | | | |
| Total Scope 1 & Scope 2 emission intensity (optional) – any metric selected by the business | | | |

HEC captures Scope 1 and Scope 2 data in detail, for each GHG as the case may have been. Simple addition of relevant data provides the information needed to be reported here.

### 5.2.6. Q9 – Details of waste management

*Table 12 Principle 6 Essential Indicator – Question 9 – Waste generated, recovered and disposed data*

| Parameter | Current FY | Previous FY |
|---|---|---|
| **Total waste generated (in metric tonnes)** | | |
| Plastic waste (A) | | |
| E-waste (B) | | |
| Bio-medical waste (C) | | |
| Construction and Demolition waste (D) | | |
| Battery waste (E) | | |
| Radio-active waste (F) | | |
| Other hazardous waste (G) | | |
| Other non-hazardous waste (H) Please specify in any (Breakup by composition i.e. by material as relevant) | | |
| **Total (A+B+C+D+E+F+G+H)** | | |
| **Waste intensity per rupee of turnover** (Total waste generated / Revenue from operations) | | |
| **Waste intensity per rupee of turnover adjusted for purchasing power parity (PPP)** (Total waste generated / Revenue from operations adjusted for PPP) | | |
| **Waste intensity in terms of physical output** (Total waste generated / Quantity of goods produced or services offered) | | |
| **Waste intensity (optional)** – any metric selected by the business | | |
| **For each category of waste generated, total waste recovered through recycling, re-using or any other recovery operations (in metric tonnes)** | | |
| **Category of waste** | | |
| (i) Recycled | | |
| (ii) Re-used | | |
| (iii) Other recovery operations | | |
| **Total** | | |

| For each category of waste generated, total waste disposed by nature of disposal method (in metric tonnes) | | |
|---|---|---|
| **Category of waste** | | |
| (i) Incineration | | |
| (ii) Landfilling | | |
| (iii) Other disposal operations | | |
| **Total** | | |

While the HEC may have captured the destination, as mentioned earlier, it may or may not have captured the detail on level of recovery or disposal treatment. For the purpose of reporting under this principle, if necessary, the data captured under HEC needs to be extended to include relevant additional information as well.

## 5.3. Leadership Indicators

### 5.3.1. Q1 – Details of water in areas of water stress

This indicator exclusively deals with water data if a plant or a unit is located in an area of water stress. For India, reports by the Ministry of Jal Shakti, Government of India, and reports by agencies such as NITI Aayog, or a relevant United Nations or multilateral agency report can be used as the basis for ascertaining whether a plant or unit is located in a defined area of water stress.

Water stress has three components that determine the level of stress:

(i) Availability – availability of water from all sources above or below ground is covered under this

(ii) Quality – quality of water for human usage, agriculture usage and industrial usage may be different. Typical assessments take into account quality of water for human and/or agriculture purposes

(iii) Accessibility – accessibility of water, primarily for human usage and agriculture is taken into account

For each plant or unit located in an identified area of water stress, the following data needs to be reported:

*Table 13 Principle 6 Leadership Indicator - Question 1 - Water in areas of water stress*

| Parameter | Current FY | Previous FY |
|---|---|---|
| **Water withdrawal by source (in kilolitres)** | | |
| (i) Surface water | | |
| (ii) Ground water | | |
| (iii) Third party water | | |
| (iv) Seawater / desalinated water | | |
| (v) Others | | |
| **Total volume of water withdrawal (i+ii+iii+iv+v)** | | |
| **Total volume of water consumption (in kilolitres)** | | |
| **Water intensity per rupee of turnover** (Total water consumed / Revenue from operations) | | |
| **Water intensity (optional)** – any metric selected by the business | | |
| **Water discharge by destination and level of treatment (in kilolitres)** | | |
| (i) To surface water | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| (ii) To ground water | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| (iii) To sea water | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| (iv) Sent to third parties | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| (v) Others | | |
| - No treatment | | |
| - With treatment – please specify level of treatment | | |
| **Total water discharged (in kilolitres)** | | |

### 5.3.2. Q2 – Details of Scope 3 GHG Emissions

*Table 14 Principle 6 Leadership Indicator - Question 2 - Scope 3 GHG Emissions*

| Parameter | Unit | Current FY | Previous FY |
|---|---|---|---|
| **Total Scope 3 emissions** (breakup of GHG into CO2, CH4, N2O, HFCs, PFCs, SF6, NF3 if available) | tCO2e | | |
| **Total Scope 3 emission intensity per rupee of turnover** (Total Scope 3 emissions / Revenue from operations) | | | |
| Total Scope 3 emission intensity (optional) – any metric selected by the business | | | |

HEC captures this data, hence simple addition of relevant data, GHG gas-wise if available, provides the information needed to be reported here.

### 5.3.3. Q7 – Percentage of value chain partners

BRSR seeks information on percentage of value-chain partners assessed from an environmental impact perspective. As noted earlier, HEC of the entire value chain showcased in the generic lifecycle (Figure 3) can be undertaken if all partners are amenable to doing so. As such, depending on whether HEC has been carried out, the percentage of partners who have undertaken the exercise can be reported here.

## 5.3. Assured BRSR Core

BRSR reporting has been a mandate for top 1,000 listed companies in India since FY 22-23. However, the regulator, SEBI, felt the need to further strengthen the reporting mandate by carving out a BRSR Core as a subset of overall BRSR for assurance. As noted earlier, in the general BRSR report, assurance is optional. However, for indicators under BRSR Core *reasonable assurance*, as described before, is mandatory. Further, for value-chain reporting, BRSR Core data with *limited assurance*, has been made mandatory.

All essential indicators covering the following are part of BRSR Core, and hence will attract mandatory reasonable assurance for the business and mandatory limited assurance from a value chain perspective:

(i) Scope 1 and Scope 2 GHG Emissions – described in Section 5.2.5.

(ii) Energy – described in Section 5.2.1.

(iii) Water – described in Section 5.2.2. and 5.2.3.

(iv) Waste – described in Section 5.2.6.


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