

Bonphul ENVIRONMENTAL REPORT

**The FY 2020-21 report creates a roadmap towards
low carbon operations and circularity**



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Introduction

Environmental degradation, climate change and the rapid extraction and consumption of natural resources are the leading global issues adversely affecting the health of the planet and its inhabitants. To combat these issues, companies across the world are developing comprehensive and multi-layered strategies as a part of their **sustainable development** initiatives.

Greenhouse gases (GHG) released into the atmosphere by burning of fossil fuels and land use changes are attributed to a global temperature rise of more than 1°C from pre-industrial times. One of the first steps companies can take is to have a detailed understanding of its GHG emissions in order to identify reduction opportunities and thereby improve operational efficiency, prepare for future climate policies, for example, regulations on energy efficiency, carbon taxes, and communicate their commitment to key stakeholders such as customers and investors.

Industrialisation, or when goods began to be mass produced, also brought about a behaviour that engendered a sense that resources are infinite. Resources are taken from the ground to make goods and when the goods are no longer needed they are thrown away. Such a system is referred to as a linear economy. Contrary to the linear economy, a **circular economy** focuses on designing out waste and pollution, keeping products and materials in use and regenerating natural systems. Organisations work towards transitioning from a linear to a circular economy to reduce their impacts during the value creation process and to create positive shareholder value.

Bonphul Air Products (Bonphul) was established four years back as a manufacturer of indoor air quality products. From FY 2021-22, it pivoted to becoming an ‘industrial gas’ company. With sustainable development as one of its founding principles, Bonphul has developed products that are certified green. The company wants to further its efforts around sustainability and hence has decided to put together an environmental report to identify, track and implement green initiatives.

Scope and aim of the study

The Bonphul Environmental Report covers two complementary aspects of sustainable development - a GHG emissions inventory of the company’s operations and circularity indicators at a product and company level.

An overview of the standards or guidelines followed by the study is given in the Annexure.

The vision of Bonphul is linked to the United Nations Sustainable Development Goals – numbers 3, 9, 11 and 12. This study aims to further the efforts of Bonphul to:

- Ensure healthy lives and promote well-being for all, at all ages, by **reducing the mortality rate attributed to household and ambient air pollution**
- Build resilient infrastructure, promote sustainable industrialisation and foster innovation by **reducing its operational GHG emissions**
- Make cities and human settlements inclusive, safe, resilient and sustainable by **paying special attention to air quality and urban solid waste generation**
- Ensure sustainable consumption and production patterns by substantially reducing waste generation through **prevention, reduction, recycling and reuse of resources**



In addition, Bonphul’s vision is to compensate the calculated GHG emissions each year by planting trees, which brings it close to a net-zero carbon footprint. The company’s carbon sequestration efforts are also covered in this environmental report.

Annual GHG emissions

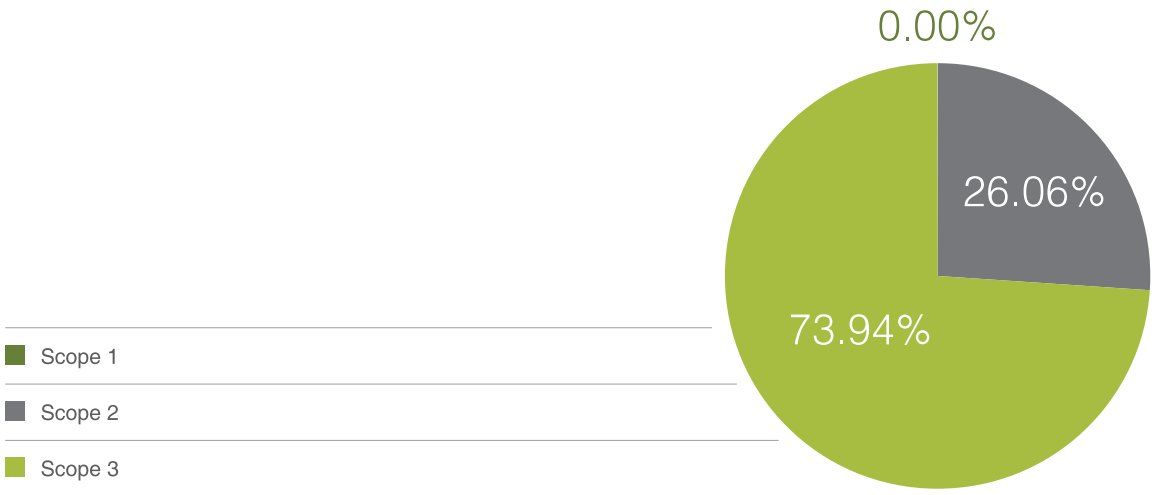
The operational boundary of Bonphul for the GHG emissions inventory FY 2020-21 is its corporate office in Noida which functions as both the administrative and manufacturing locations. The inventory covers all three scopes or categories with the following sources of emissions:

- Scope 1 - direct emissions from the use of fuels, and fugitive emissions
- Scope 2 - indirect emissions from purchased electricity consumed at the facility
- Scope 3 - indirect emissions from the purchase of primary raw materials, transportation of goods and commute of employees

The emissions for the year FY 2020-21 is a total of 7,961.82 kg CO2e.

Scope 3 was the largest contributor with 5,887.22 kg CO2e (73.94% of the total emissions), followed by scope 2 with 2,074.60 kg CO2e (26.06 %). The fugitive emissions from the use of refrigerants in air conditioners was not captured because of the lack of data, hence emissions from scope 1 are 0% of the total annual emissions as depicted in the graph.

Figure 1: Annual emissions by scope (%)



An inventory of the GHG emissions by month and category are shown in the table below.

Table 1: Emissions by month and category (kgCO2e)

| Emissions (kg CO2e) | Scope 1 | Scope 2 | Scope 3 | Scope 4 |
|------------------------|-----------------------|---------------------|----------------|------------------|
| | Fugitive emissions | Grid electricity | Transportation | Raw materials |
| April | - | 139.40 | 115.26 | - |
| May | - | 131.20 | 115.26 | - |
| June | - | 213.20 | 869.30 | 19.81 |
| July | - | 196.80 | 131.26 | 204.48 |
| August | - | 188.60 | 119.76 | 180.73 |
| September | - | 205.00 | 869.53 | 133.60 |
| October | - | 188.60 | 115.26 | 69.80 |
| November | - | 155.80 | 152.01 | 73.83 |
| December | - | 147.60 | 138.97 | 132.62 |
| January | - | 139.40 | 845.59 | 76.37 |
| February | - | 172.20 | 115.26 | 34.90 |
| March | - | 196.80 | 1,373.18 | 0.47 |
| Total by scope | - | 2,074.60 | 4,960.62 | 926.60 |

The initiatives that Bonphul can look into to reduce its GHG emissions are examined in the section titled ‘Next steps for Bonphul’. The following section of the Bonphul environmental report explores its second pillar – the transition to a circular economy.

Circularity indicators

Circularity indicators measure the degree of transition from a linear economy to a circular economy. This report examines the circularity of Bonphul at a product and at a company level. The circularity indicators are put together using tools developed by the Ellen MacArthur Foundation¹. These tools take into account multiple parameters, based on which a circularity score is generated.

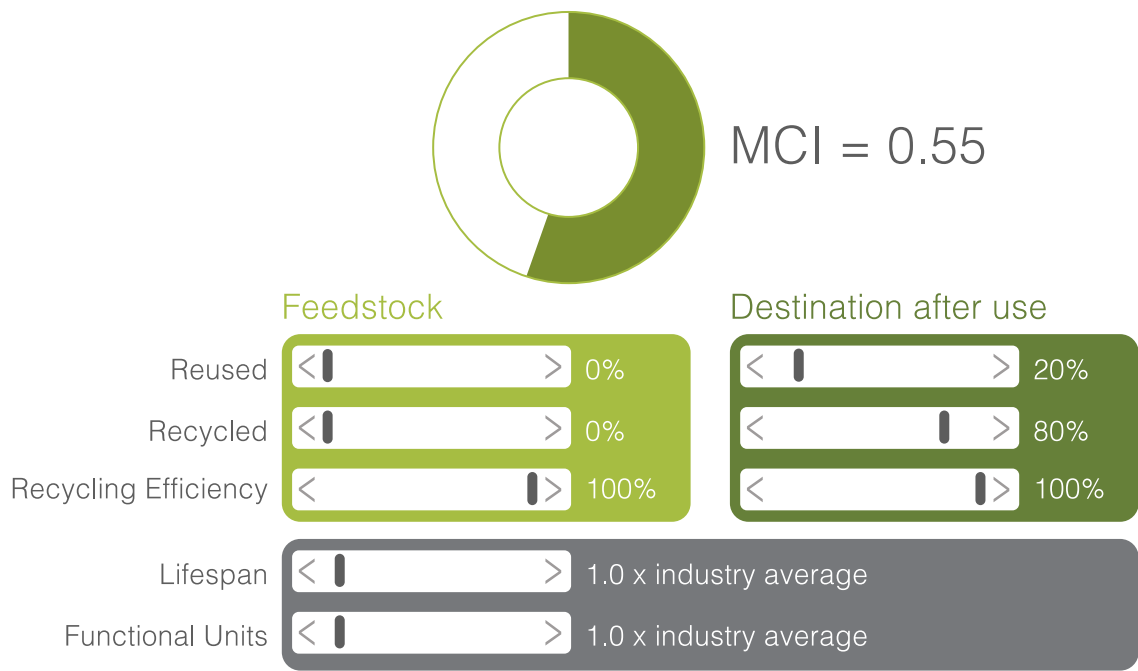
Product level circularity score

The Material Circularity Indicator (MCI) generated through a dynamic modelling tool is a product level circularity score. The tool was used to generate a score for Bonphul’s product called OxyMax 10 which was sold in FY 2020-21.

The parameters of the product considered by the tool are the reusability, recyclability, and recycling efficiency of the raw material or feedstock and of the product at the end of its usefulness. It also takes into account the utility of the product. Based on these parameters, a score ranging from 0 to 1 is generated for the product. A product that is completely linear uses virgin raw materials and, at the end of its life, all its components are sent to landfill or are incinerated. Such a product will have an MCI of 0. A completely circular product, which uses recycled components as raw materials, and every component of the product can be reused or recycled with 100% efficiency, has an MCI value of 1.

A detailed methodology of the scoring mechanism is given in the Annexure.

A snapshot of the dynamic modelling tool with the results for OxyMax 10 is given below:



The MCI for OxyMax 10 for FY 2020-21 is 0.55. Recommendations on how the score can be improved in the coming years is provided in the section titled ‘Next steps for Bonphul’.

Company level circularity score

A tool called Circulytics measures a company’s circular economy performance and provides a circularity score at the company level. The score indicates a company’s preparedness and the progress it made in its transition from a linear to a circular economy.

The score ranges from E to A which cover themes under two primary categories – Enablers and Outcomes. A good Enabler score indicates that the company has plans and processes in place to enable the transition to a circular economy. A good Outcome score indicates that progress has been made by the company towards the transition. Some details on the methodology of Circulytics is given in the Annexure.

The breakdown of the company-level score is given in Table 2. It shows that the overall score for Bonphul is C- which is a consolidation of the Enabler and Outcomes scores. The Enabler score is E; this is derived from its themes related to plans and processes such as innovation and people and skills. The Outcomes score is C-; this is obtained from its themes that measure the success of the planning and processes such as product and material and services.

Table 2: Company-level score breakdown

| Overall | Score |
|--|-----------|
| Enablers | E |
| Strategy and planning | C- |
| Innovation | E |
| People and skills | E |
| Operations | E |
| External engagement | E |
| Outcomes | C- |
| Products and Materials | D |
| Services | A |
| Plant, property and equipment (PPE) assets | A |
| Water | N/A |
| Energy | D- |
| Finance | N/A |

¹ Note: Ellen MacArthur Foundation does not endorse the organisation and has not verified the information provided

Figures 3 and 4² show the industry benchmark for themes under the Enabler and Outcome categories respectively. The theme-level benchmarks are essentially theme-level averages of companies that have completed the Circulytics assessment within a given industry classification and within a broader industry group. The benchmark is created when there is a minimum of 6 scores and a maximum of 45 scores. That being said, the benchmark may not be representative benchmarks of that entire industry.

Figure 3: Industry benchmark for Enablers

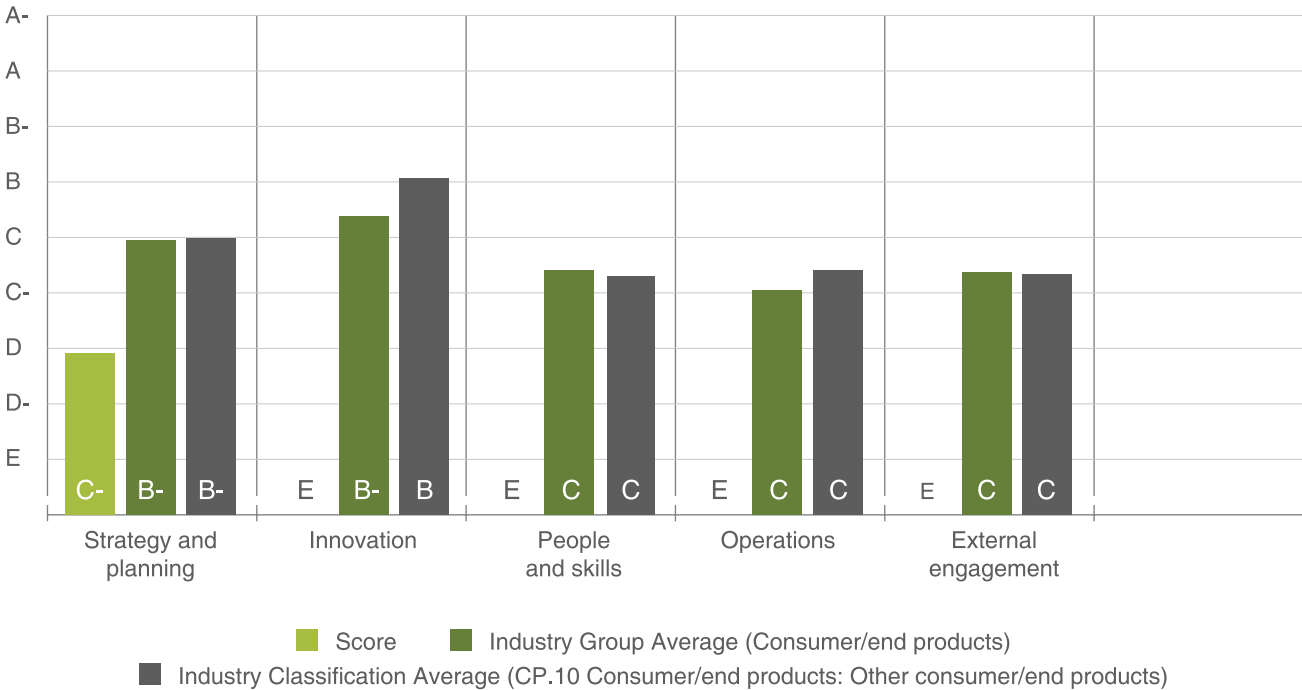
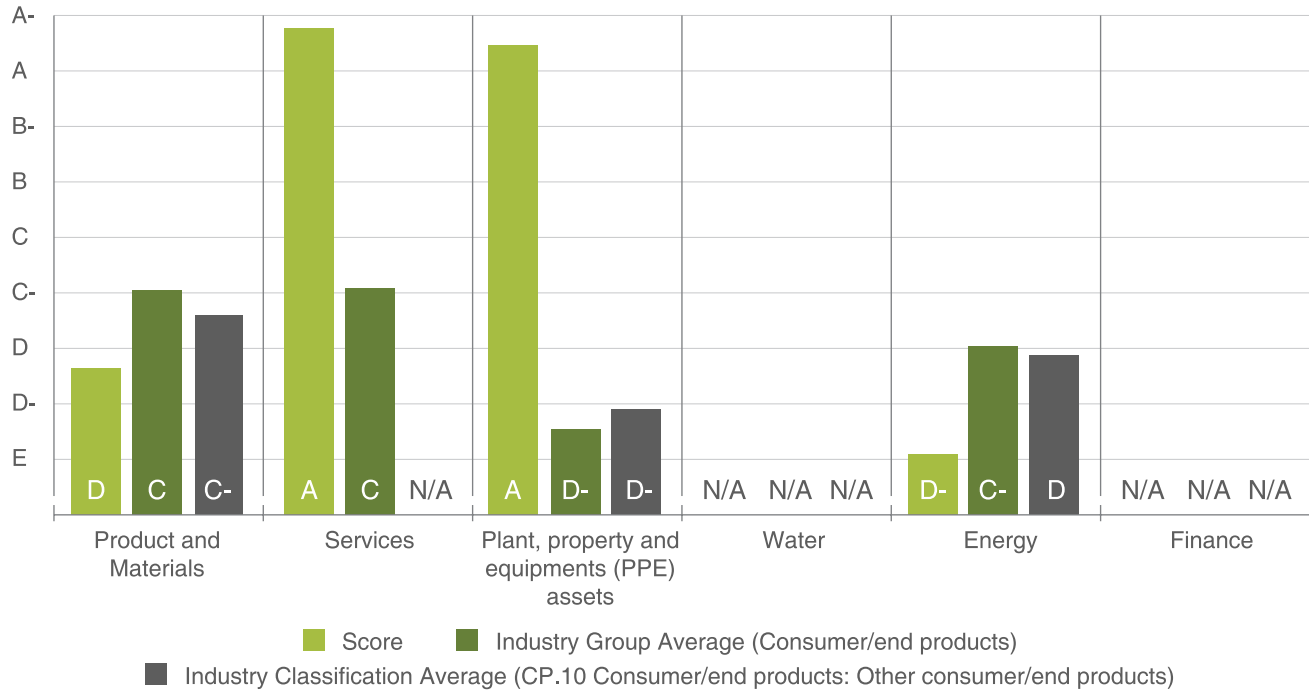


Figure 4: Industry benchmark for Outcomes



As shown in Figure 3, Bonphul has scored much lower than the industry benchmark for themes under the Enabler category. The primary reason for this is that the company did not have plans and processes in place for the transition to a circular economy during FY 2020-21.

However, as illustrated by Figure 4, out of all themes under the Outcomes category, the company scored well in two categories – plant, property and equipment assets and services. The high score can be attributed to their products which have a modular design. The design allows for easy disassembly and repair and the components are completely recyclable. For the services theme, the company is awarded a high score because it offers annual maintenance for products which lengthens their lifespan.

Overall, the products and services of Bonphul are aligned with principles of circular economy. With improvements in the Enabler category, the company can expect a higher overall score in the coming years. Recommendations on how Bonphul can improve its score are provided in the ‘Next steps for Bonphul’ section.

² The data in the industry benchmark shown in this report is from Circulytics assessments submitted between January and August 2020

Current mitigation measures

Carbon sequestration

Following the GHG emissions inventory, one of the initiatives that Bonphul has already considered is the voluntary offsetting of its emissions. The method selected by the company is carbon sequestration through the planting of trees.

Trees absorb carbon dioxide as a part of their metabolic process and release oxygen as a by-product, making them one of the most important organisms to help maintain the health of our planet. In fact, reforestation and ecosystem restoration are the best known methods that can be employed to remove polluting gases already in the atmosphere.

Bonphul has partnered with One Tree Planted to invest in the planting of 350 trees in Indian reforestation projects. It is estimated that the 350 trees will capture 8,000 kg CO₂ in 20 years to compensate for the FY 2020-21 GHG emissions of 7,961.82 kg CO₂e. The trees will capture the said carbon at rate of 23 kg CO₂ per year once they are mature.

One Tree Planted and its partners in India work with local communities spread across twelve states. Their focus is around the planting of fruit trees. In addition to the environmental benefits, the fruit trees help reduce hunger and malnutrition and improve local economies. In the coming years, Bonphul can prepare a GHG emissions trajectory and invest in sequestration or offset programs which would compensate for all its emissions in order for it to become carbon neutral by a set target year.



Next steps for Bonphul

With this baseline report, Bonphul has a broad overview of its GHG emissions and its material circularity.

GHG emissions

For the GHG emissions report, it is recommended that Bonphul add additional emissions categories in their subsequent inventory in order to have a broader and more holistic understanding of its impact on the environment. The categories include emissions from waste generated and disposed of, a wider range of raw materials such as stationary, small electrical items and other durable goods, and fugitive emissions from refrigerants in air conditioners and refrigerators.

While the company is putting together a complete emissions inventory, it may also choose to set itself an emissions target. Typically one of two approaches are taken up by companies:

- reduction of absolute emissions, which is the reduction of total emissions to zero, or
- reduction of emission intensity, which is the reduction of the volume of emissions per unit of turnover or employee strength

If Bonphul chooses the second approach, which is typically the intermediary approach, the emission intensity for its baseline year is 365.78 kg CO₂e / INR lakh turnover or 1,326.97 kg CO₂e / employee.

Some initiatives that Bonphul can explore are listed hereunder:

- conducting an energy audit to assess the energy efficiency potential
- procuring the majority of electricity demand from renewable sources through the open access route (purchase from a third party)
- sourcing raw materials: a long-term strategy may include building alliances along the entire supply chain where each player reduces emissions

Material circularity at the product level

After the first material circularity index for Bonphul's products, the following initiatives can be explored:

- sourcing feedstock from suppliers that reuse and recycle materials (in FY 2020-21 all the components were made out of virgin materials)
- improving end-of-use circularity by implementing a process during the maintenance and repair of a product to ensure that components are collected for reuse and recycling with a high efficiency rate
- continually modifying the design to improve the utility of the product and thereby increasing its lifespan and functionality

Annexure - overview of the standards

Circularity at a company level

The following measures can be looked into for improving the circularity of Bonphul:

Overall strategy

- developing and executing a circular economy implementation plan that takes into account profitability impact as well
- incorporating circular economy principles built into all the aspects of business operations
- setting targets at the organisational level and for individual business functions like innovation and procurement
- reviewing and reconfiguring existing plant, property and equipment (PPE) assets, processes, IT and digital systems in order to support circular business models, products and services
- having a dedicated resource to ensure the success of the implementation plan
- assigning roles and responsibilities, and training employees based on their business functions

Raw materials

- engaging with suppliers to increase sourcing based on circular economy principles
- increasing the use of recycled and reused materials for production

End-of-use

- ensuring that the maximum amount of waste gets recycled or reused by identifying industries which can use the waste as their raw materials
- engaging with waste collectors and scrap dealers to know the recycling efficiency of the waste; i.e. the percentage of waste that is recycled, sent to landfills and or incinerated

Communications

- communicating the implications of circular economy strategy and implementation plans internally
- disclosing the circular economy strategy and measurable circular economy targets in the annual report
- communicating with customers and stakeholders on the company's plans to become circular on different platforms, such as social media

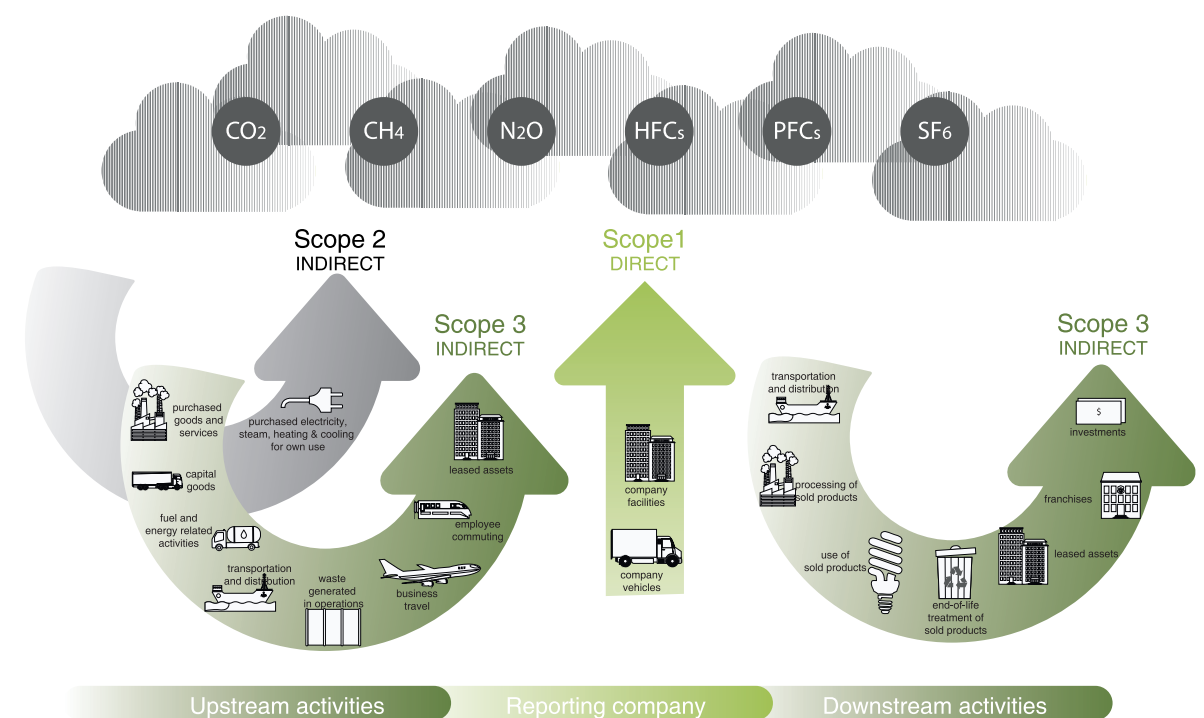
GHG emissions inventory

The GHG emissions are put together using the guidelines of the globally-recognised GHG Protocol: Corporate Accounting and Reporting Standard. The standard helps organisations identify, calculate and report their GHG emissions in an accurate, consistent and transparent manner.

The tool incorporates national emission factors where available or default global values to convert different organisational activities into the respective greenhouse gases emitted. The seven greenhouse gases reported under this standard include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbon (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃). The combined emissions are expressed in tonnes of carbon dioxide equivalent (tCO₂e), which compares all the greenhouses to carbon dioxide. The use of CO₂e helps simplify the accounting process and analysis as the emissions are represented by a single value.

The GHG Protocol mandates that the activities of organisations be split into three categories or scopes for a more transparent accounting structure:

- **scope 1** – direct emissions from sources owned and controlled by the company; e.g. emissions from equipment and vehicles owned by the company
- **scope 2** – indirect emissions from the generation of purchased electricity consumed at company facilities
- **scope 3 (optional)** – indirect emissions that occur as a consequence of the company's activities, but from sources not owned by the company, e.g. transport of purchased goods, work-related travel



Product-level circularity indicator

Details on the parameters considered to calculate the MCI are as follows:

- **Reused components in feedstock [FU]** – the fraction of mass of a product's feedstock from reused sources. For example, if a motor in a toy is reused in a new toy and if its weight is 20% of the total weight of the new toy, the FU will be 20.
- **Recycled components in feedstock [FR]** – the fraction of mass of a product's feedstock from recycled sources. For example, a piece of furniture which is manufactured using 80% of its total weight with recycled plastic, will have an FR of 80.
- **Recycling efficiency of feedstock [EF]** – the efficiency of the recycling process used to produce recycled feedstock for a product. For example, for components made out of recycled plastic, some certain amount of plastic would have been collected, and maybe 80% of that amount would have been recycled to make the component. The EF for this case will be 80.
- **Reusable components in collected product (end of use) [CU]** – the fraction of mass of a product going into component reuse
- **Recyclable components in collected product (end of use) [CR]** – the fraction of mass of a product being collected to go into a recycling process. For example, if 90% of the weight of a PET bottle of a soft drink is recycled after use, the CR will be 90.
- **Recycling efficiency of collected product [EC]** – the recycling efficiency of the recyclable components in the collected end-of-use product (CR). It shows the ratio of weight of recycled components obtained after recycling, and weight of recyclable collected end of use product that was used to feed the recycling unit.
- **Lifespan [L]** - It is a ratio of the number of years a particular product can be used for compared to that of an industry average product. For example, if the average lifespan of mobile phones is 3 years, and company A manufactures a mobile phone which has a lifespan of 4 years, L in this case would be 1.33 (= 4/3).
- **Functional units from the product [U]** – actual average number of functional units achieved during the use phase of a product. For example, if an average printer can print 25 pages in a minute, and the printer manufactured by a company B can print 60 pages per minute, U will be 2.4 (= 60/25)

Based on these basic parameters, the following set equations are sequentially calculated by the tool to derive the MCI:

- Percentage of virgin feedstock (V) = $1 - FR - FU$
- Percentage of collected end of use product sent to landfill ($W0$) = $1 - CR - CU$
- Waste generated during recycling of recycled feedstock (Wf) = $FR \times (1 - EF) / EF$
- Unrecoverable waste at collection stage (Wc) = $(1 - EC) \times CR$
- Total unrecoverable waste (W) = $W0 + (Wf + Wc) / 2$
- Product utility factor (X) = $L \times U$
- Utility factor built as a function of the utility X of a product $f(X) = 0.9/X$
- Linear Flow Index (LFI) = $(V + W) / (2 + (Wf - Wc) / 2)$
- Material Circularity Index (MCI) = $1 - LFI \times f(X)$; or 0 {if the result is negative}

For a more detailed explanation of these equation, go to - <https://www.ellenmacarthurfoundation.org/assets/downloads/Circularity-Indicators-Methodology.pdf>

Company-level circularity indicator

For company level scores, the tool Circulytics is used. The data for the score is collected in the form of a survey. The survey collects qualitative information to generate a score indicating the preparedness and progress made towards a transition from linear to circular economy.

The survey is divided into multiple chapters or themes which are nested under two categories - Enablers and Outcomes. The Enablers category consists of themes such as strategy and planning, innovation, external engagement. These themes have questions around aspects which enable the transition to a circular economy. The Outcomes category consists of themes like products and materials, services, and plant property and equipment assets. These themes have questions around the composition of products, the recyclability of waste materials, services around circular economy. In all, the survey questions throw light around the plans of the company and the outcome of the company's plans on circularity.

Moreover, the survey questions are designed such that the companies responding to them can understand precisely what they have to do to get a better score for each question next time. A better scoring option would suggest an action point for the company, and working on that will aid in the transition from a linear to a circular economy.

For more information about the tool, go to - <https://www.ellenmacarthurfoundation.org/assets/downloads/Circulytics-question-indicator-list.pdf>



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