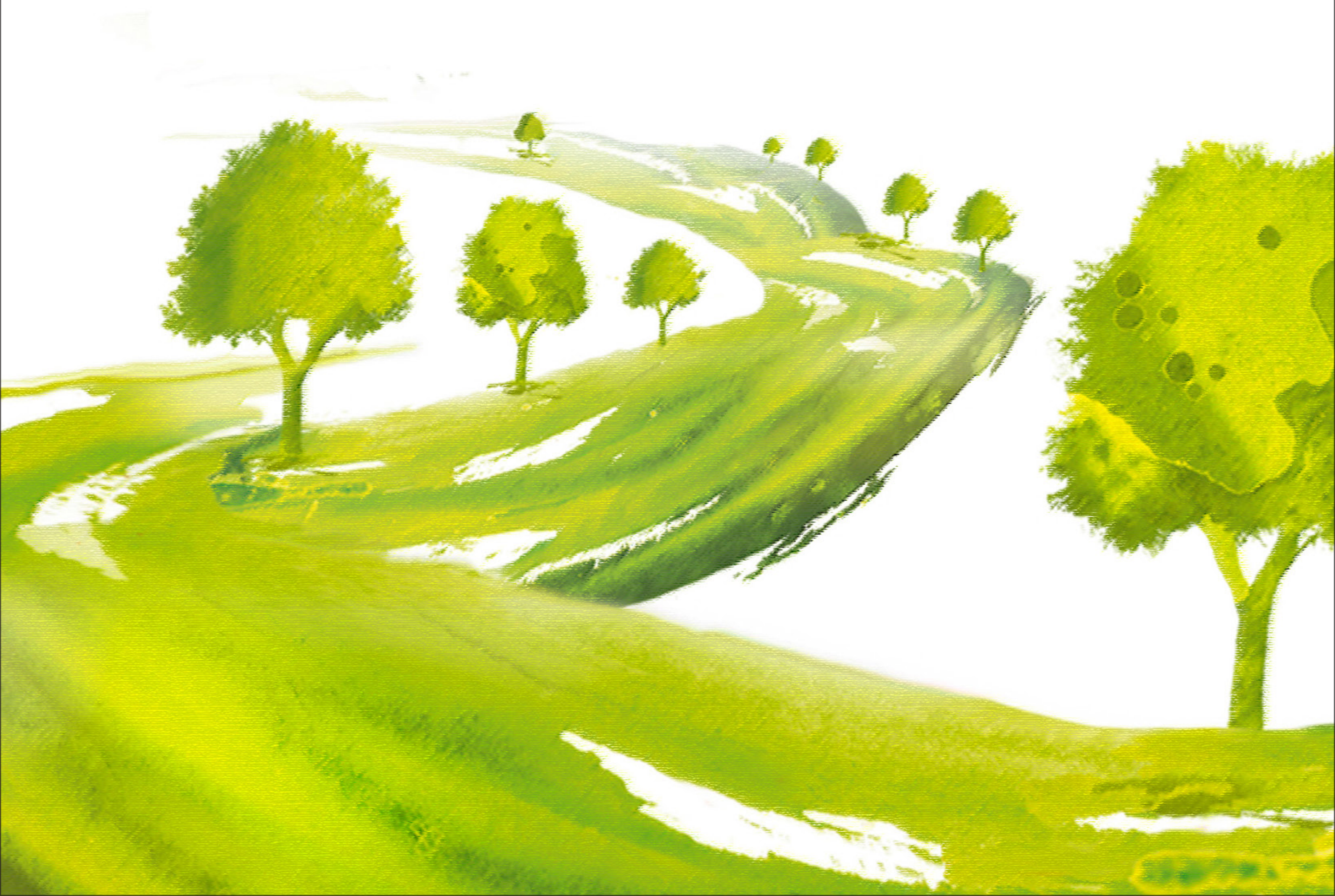
AurovilleConsulting

Hidesign
India Private Limited

GREENHOUSE GAS INVENTORY

FY 2019-20



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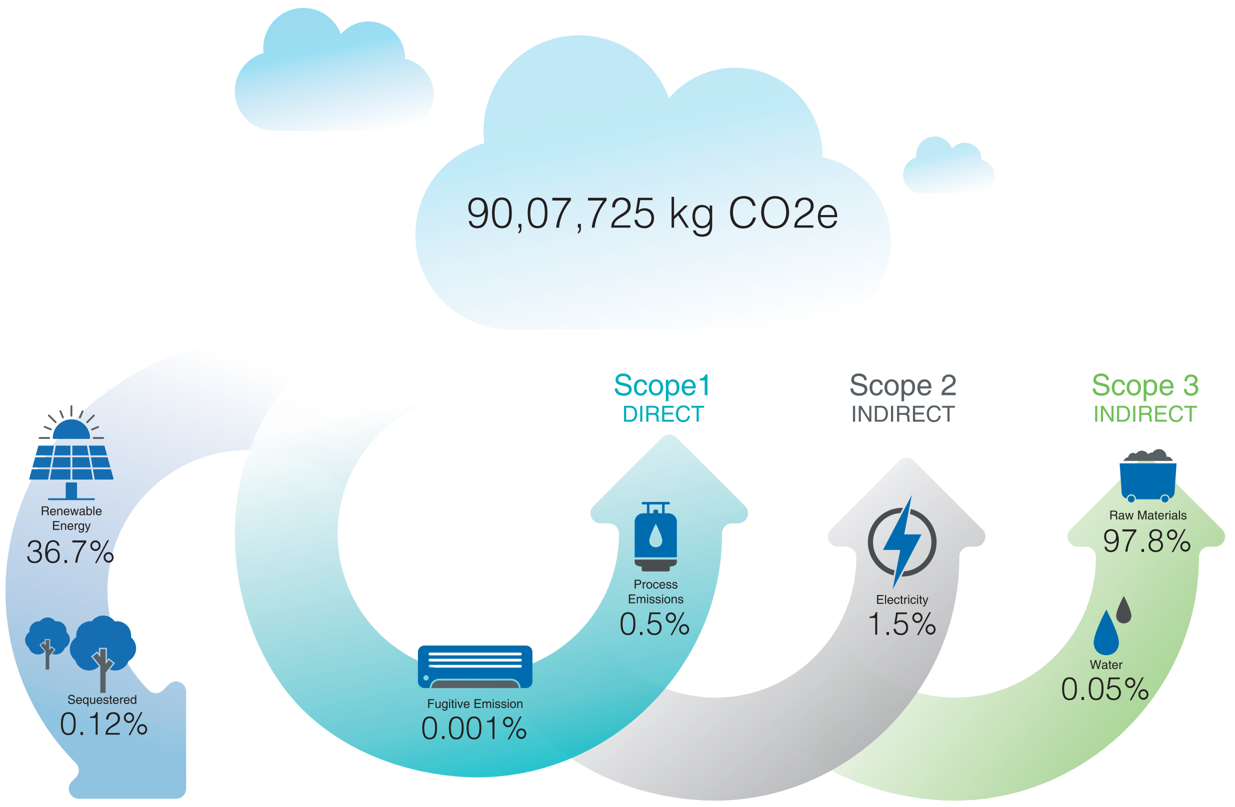
Summary



Leather manufactured (m2)

Emissions Intensity
58.06 kg CO_2e

Water footprint
30.16 litres

Waste generated
0.03 kg

Environmental Impact by square meter of product manufactured

Contents

Introduction

Climate change is one of the most pressing challenges faced by planet Earth today. Human activities have contributed to a global temperature rise of over 1˚C from the pre-industrial era. This rise of temperature can be attributed to the presence of greenhouse gases (GHGs) in the atmosphere. The consequences can be seen in the form of extreme weather conditions, extinction of plant and animal species, rise in sea level, reduction in crop yields and scarcity of water, to name a few.

Companies across the world are increasingly aware of the global drive towards sustainable development. To ensure long-term success in a competitive business environment, companies are developing effective strategies to take early action. The first step for any company is to have a detailed understanding of its GHG emissions. An emissions inventory helps them:

- Identify reduction opportunities and thereby improve operational efficiency
- Prepare for future climate policies, e.g. regulations on energy efficiency, carbon taxes
- Communicate their commitment to key stakeholders, such as customers and investors

Hidesign India Pvt. Ltd. (Hidesign) is a manufacturing company in Tamil Nadu which produces handcrafted leather products and supplies them around the world. Hidesign decided to put together a baseline GHG emissions report for the financial year 2019-20 to assess its environmental impact and identify ways to reduce it.

Scope of work

This study is put together using the guidelines of the globally-recognised tool, the 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 (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbon (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3). The combined emissions are expressed in kilograms of carbon dioxide equivalent (kg CO_2e), which compares all the greenhouses to carbon dioxide. The use of CO_2e 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. The activities covered under each scopes are shown below in Table 1:

Table 1: Definition of scopes for corporate accounting

Scope 1	Direct emissions	Emissions from sources owned and controlled by the company; e.g. emissions from equipment and vehicles owned by the company
Scope 2	Indirect emissions	Emissions from the generation of purchased electricity consumed at company facilities
Scope 3	Other indirect emissions (optional)	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

In order to undertake a more holistic approach, the report delves into the details of the waste production, segregation and disposal, and the total water consumption and harvesting techniques adopted by the organisation.

Annual GHG Emissions

The sources of emissions covered under each scope are given below.

Scope 1

Emissions from machines and processes inside the operational control of the company, i.e. the factory premises in Villianur, Puducherry. The sources include:

- Diesel burnt for operating of a generator and a furnace
- Refrigerant leakage from air conditioners in the form of HFCs and HCFCs

Scope 2

Grid-supplied electricity consumed by the factory or the electricity produced outside the factory premises by the state utility.

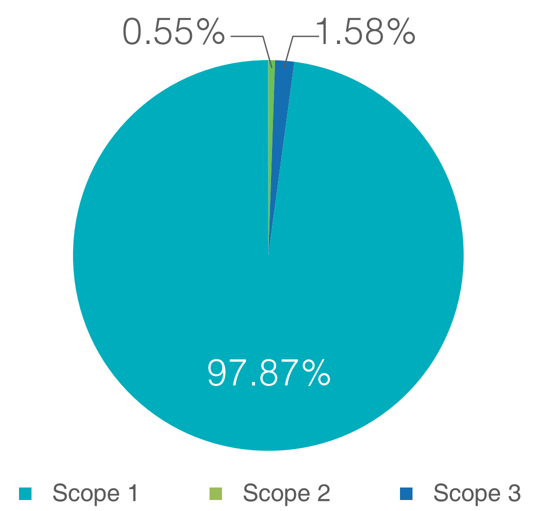
Scope 3

Indirect emissions from activities outside the operational boundary of the factory. The categories covered are:

- Primary raw materials used namely leather
- Leather waste during the manufacturing process
- Water for processing leather goods

In addition to emissions generated, the report considers the CO2 sequestered by trees planted on site. No offsetting activities outside the factory have been carried out so far.

Figure 1: Emissions by scope (%)



The annual emissions for Hidesign for FY 2019-20 is 90,07,725 kg CO2e.

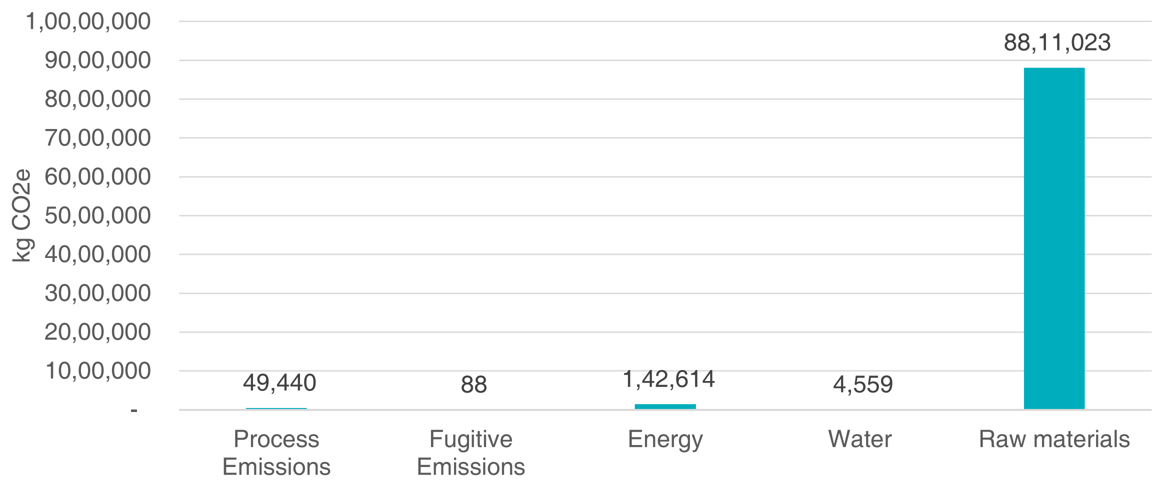
As seen in figure 1, scope 3 emissions cover 97.87% (88,15,582 kg CO2e) and hence is the highest contributor of all the scopes followed by scope 2 which is 1.58% (1,42,614 kg CO2e) and scope 1 at 0.55% (49,528 kg CO2e).

The emissions from scope 3 can be attributed to the upstream emissions from the raw materials in the leather manufacturing processes. These emissions are attributed to external factors not within the operational control of the organization and may be occurring in Scope 1 or direct emissions of the primary manufacturing organizations.

Emissions by category

The objective of analysing emissions based on category is to provide awareness on major causes of emissions, which can lead to targeted interventions. In addition, inputs on improving the quality of data and recommendations for future inventories have also been provided below.

Figure 2: Emissions by category (kg CO2e)



Fuels

The company uses diesel for melting brass in the furnace and during the forging process. In addition it uses diesel to generate electricity during a power outage.

As data on the consumption of diesel is not available based on the site of consumption, i.e. furnace or generator, the assessment considers all emissions as a part of their **manufacturing process**. With a total of 49,440 kg CO2e, process emissions contributes to 99.8% of total scope 1 emissions and is the highest contributing category of emissions.

The diesel consumption data was collated based on purchase details through monthly bills from the local petrol station.

A few recommendations to reduce process-based emissions include:

- Maintaining machines regularly to ensure proper functioning and high fuel efficiency
- Recording machine-wise fuel consumption to make sure machines are functioning properly and to improve data quality
- Transitioning from diesel-based to biofuel based furnaces.

Refrigerants

Fugitive emissions caused by the leakage of refrigerants from the use of air conditioners, which form part of scope 1 emissions, released 88 kg CO_2e or 0.2% of the total scope 1 based emissions.

For this year's inventory, the data available was the number of air conditioners used by the company and the year of purchase. From this data, the total fugitive emissions was derived based on the average leakage and possible refrigerant type.

The following are a couple of recommendations to reduce fugitive emissions:

- Leakage from air conditioners can be minimized through regular maintenance and inspection
- Detailed records of maintenance activities undertaken on air conditioners along with type and volume of refrigerant gas refilled will help enhance accuracy of future inventories

Electricity

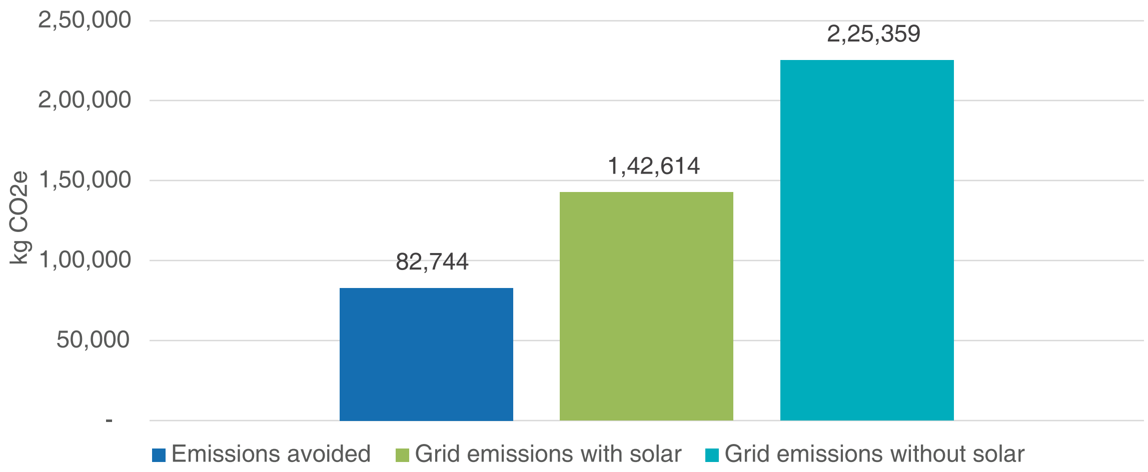
Grid-supplied electricity contributed to a total of 1,42,614 kg CO_2e or 2% of the total emissions of the plant. The consumption data was collected through the utility bills, which is a reliable and accurate source of data.

The company can explore the following options to reduce the energy demand:

- Invest in energy efficient pumps, motors and manufacturing equipment.
- Invest in battery storage to retain energy produced by solar PV system.
- Measure and monitor the consumption of individual departments and processes for further ccuracy and efficiency
- Implement systems, procedures and training to reduce consumption on the long term.

In FY 2018-19, the organization began transitioning to renewable sources of energy by installing an on-site rooftop solar photovoltaic (PV) system. Although the system is highly under-utilised, it is estimated that through the rooftop solar PV system, the company avoids 36.7% of its total electricity emissions. Furthermore, adding battery storage capacity as per available funds will continue to reduce the environmental impact of the organisation.

Figure 2: Potential emissions avoided through solar



Raw materials

The total emissions from the purchase of raw materials are 88,11,023 kg CO_2e or 97.8 % of the total emissions of the organisation.

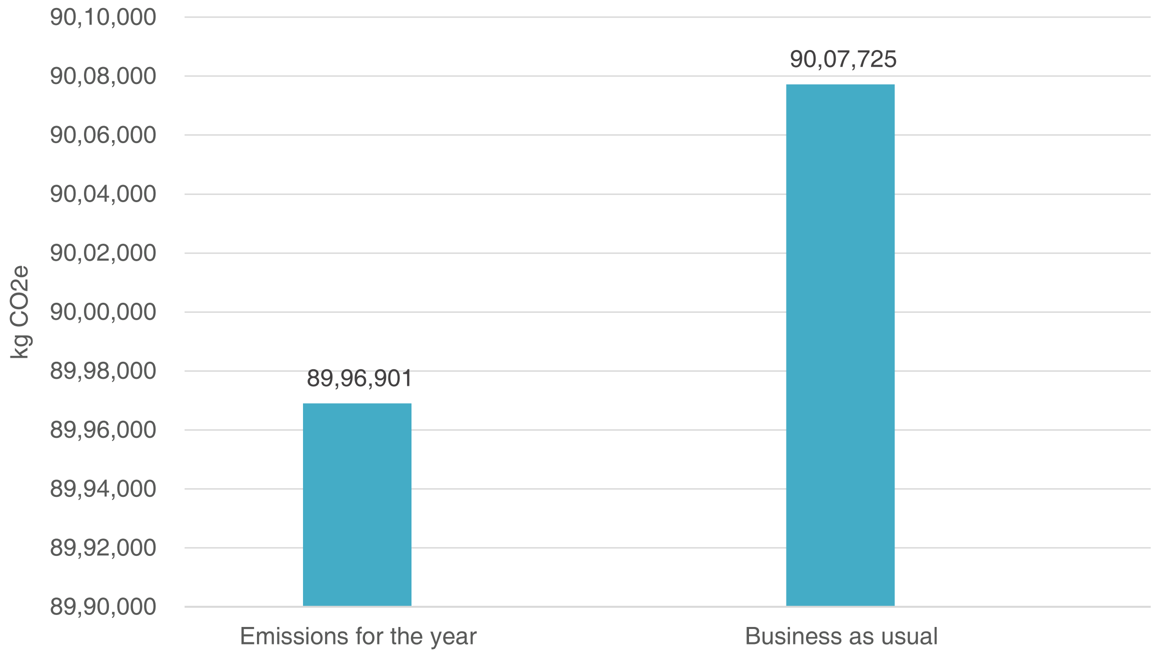
It is important to note that the company reused the initial cutting residue leather for smaller products in the process. A total of 4,798 sq m of leather was recycled saving 2,72,526 kg CO_2 of emissions arising from sending the materials to the landfill.

Data on the quantities of raw materials procured was collected from the accounts department which has details on all purchase orders, thus providing accurate information.

Raw materials used by the company are integral to its manufacturing process thus it cannot altogether be avoided. However, a greater understanding of supplier details and their emissions, will help make informed decisions and improve the estimates for reducing scope 3 emissions over time.

Carbon sequestration through tree planting

Figure 3: Comparison between business as usual and carbon sequestration



Over the last 15 years, Hidesign has planted 492 trees spanning different species on its factory premises. During this inventory year, it is estimated that the trees sequestered 10,824 kg CO2e which is 0.1% of the total emissions.

This does not take into account the various tree planting projects outside the campus, funded by the organisation in the past. From the next inventory, the company can record its planting efforts in order to have a fuller understanding of its carbon offsets.

Process-based water use

The consumption, treatment and disposal of water is an important factor to consider for every entity in order to ensure global water security. Its scope covers GHG emissions but goes well beyond it as it also considers the depletion of the natural resource, which is vital for plant and animal life.

The company uses water primarily for the electrolysis and lacquering process.

The data on water consumption was collected through invoice records for the purchased water, which provided accurate information.

A few recommendations around water use are listed below:

- Water used for processes should be reused as much as possible; therefore processes that allow for the storage of water after use can be looked into
- Data on the amount of rainwater harvested, which feeds the groundwater system, can be collected; to help showcase whether the rainwater harvesting activity replenishes the ground water reserves beyond the quantity consumed.

Process-based waste generation

The management of waste is an important factor to consider for all manufacturing companies. The scope for waste management, like water, goes beyond the GHG emissions. Waste if not treated properly can contaminate natural resources and affect the health of the planet and its inhabitants.

The company has a waste segregation protocol, which mainly includes leather. None of the waste at the site is hazardous, hence the treatment of waste before disposal is not needed. All the leather waste is recycled by making zip holders and processing the rest into leather paper-like bags and thus prevents the waste from being landfilled. For FY 2019-20, a total of 4,798 Sq m of leather was recycled saving 2,72,526 kg CO2e.

The data on scrap leather was collected from log books, which document the weight of the waste at time of sale.

For the next inventories, waste from other categories such as plastic and paper used during packaging, and organic waste from kitchen can be collected to understand waste better and to eventually reduce it to a minimum.

Conclusion

With this baseline report, Hidesign has a broad overview of its GHG emissions.

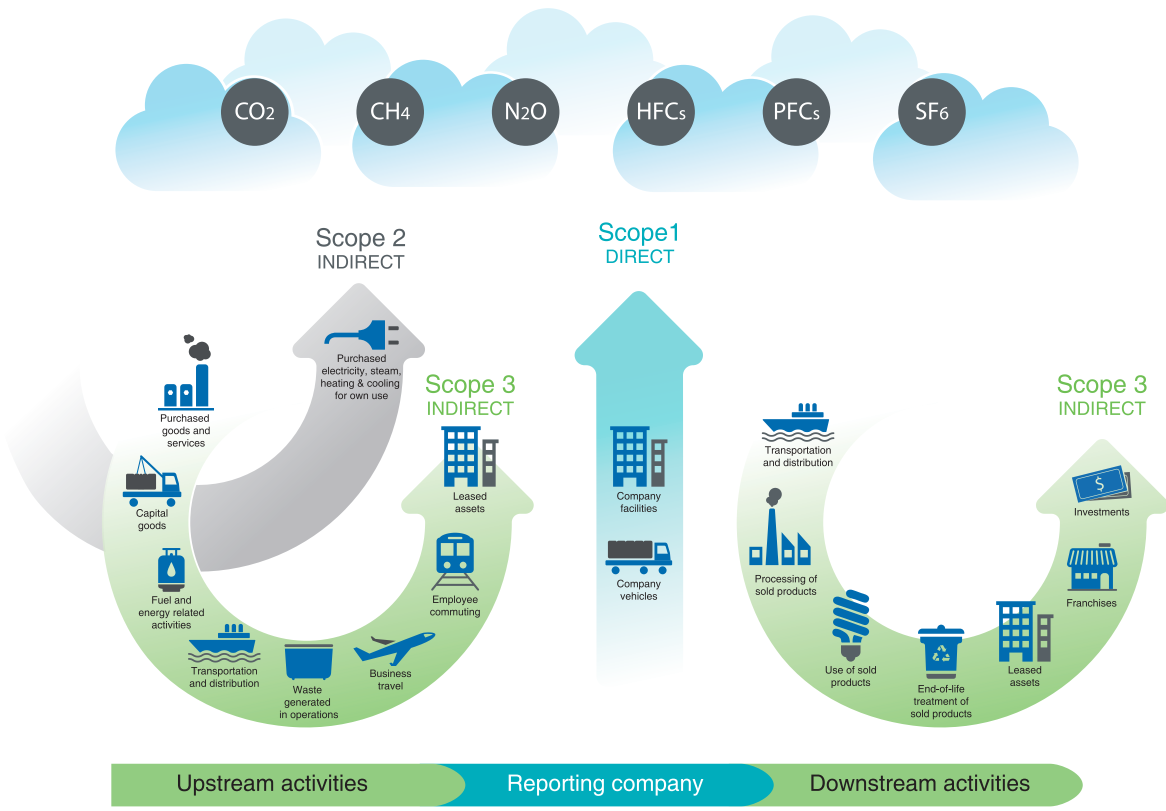
It is recommended that the company add additional emissions categories as explored in the category-wise emissions section. For the next inventory, the company may also choose to set itself an emissions target. Typically one of two approaches are taken up by companies:
- reduction of absolute emissions, which is the reduction of total emissions to zero, or
- reduction of emission intensity, which sees the reduction of the volume of emissions per unit of turnover, employee or product manufactured

If Hidesign chooses the second approach, which is typically the intermediary approach, the **emission intensity** for its baseline year is 58.06 kg CO2e / square metre of leather manufactured. In addition, the **water footprint** is 30.16 litres / square metre of leather. Furthermore, the **waste generated** is 0.03 kg / square metre of leather.

Auroville Consulting, which put together this baseline report, can help Hidesign manage its carbon, bring down its emissions intensity and pave its way towards carbon neutrality. Some of the practices that Hidesign would require to undertake on a regular basis are the following:
- preparing annual emissions inventories
- setting a science-based target
- identifying and implementing mitigation measures
- compensating emissions through offsetting programs
- reporting progress to stakeholders, and
- evaluating carbon strategy

Annexure A – Methodology

Figure 7: Overview of scopes and emissions across a value chain



For all emission sources, GHG emissions are estimated by multiplying activity data by an emission factor associated with the activity that is being measured. Activity data is a quantitative measure of an activity during a given period of time that results in GHG emissions (e.g. litres of diesel used, kilometres driven and tonnes of waste sent to landfill). An emission factor is a measure of the mass of GHG emissions relative to a unit of activity. For example, data on electricity consumed to power a factory, measured in kilowatt-hours (kWh), is multiplied by the emission factor for electricity (kgCO2/kWh) to estimate the total amount of GHG emissions.

Each GHG has different characteristics, the two most prominent ones for the purpose of measuring them are: the amount of heat it absorbs and its lifespan. This is measured by the Global Warming Potential (GWP) which describes the warming potential of one unit of a given GHG relative to carbon dioxide.

Emissions from each activity are reported in metric tonnes of GHGs emitted as well as their carbon dioxide equivalent (CO2e). CO2e is a universal unit that simplifies the accounting process by producing a single number to describe the impact of all the greenhouse gases; this is done by using the GWP of each GHG.

Annexure B – References

The sources of emission factors used to derive the Hidesign emissions inventory are listed below.

Table 2: Sources of emission factors

SL No.	Emission factory Category	Reference
1	Diesel	India GHG Program – India specific road transport emissions (2015)
2	LPG	The data taken from UK Government GHG Conversion Factors 2016 for Company Reporting.
3	Electricity	Electricity emission factor CEA report 2016
4	Manufactured leather	National Taipei University of Technology- Analysing the carbon footprint of finished bovine leather (Taipei 2014)

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