WOMEN GOING GREENER

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WomEn Going Greener

Reducing the environmental footprint of Female Entrepreneurship

MODULE 4

Pathways to sustainability and tools for a Greener Future

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Contents

Introduction

Nowadays, the issue of climate change has become part of our everyday lives and affects even businesses. Therefore, it is of utmost importance that they start implementing measures and adopt habits that will comply with environmental standards and will become more environmentally friendly. The following modules analysed by WEnCoop propose some measures that businesses which are women-led and owned can adopt to reduce their impact on the environment and operate in a greener manner. Moreover, these modules include ways of making women business owners their companies more sustainable with the adoption of practical tools including techniques to save energy, reduce their waste and become more familiar with the principles of circular economy. Furthermore, they will become aware of other available energy sources which are equally efficient and will learn about the need for and importance of conducting energy audits and assessments, use sustainable supply chain management and become familiar with the carbon footprint calculators to measure their carbon footprint in the environment.

Aims and objectives

- ✓ Equipping participants with practical tools to transform their business to a more sustainable one and learn more ways to go greener
- ✓ Navigate through other available sources and technologies which are energy efficient and cause limited harm to the environment

Module 4 – Pathways and tools to a greener future

i) Energy saving techniques

Energy conservation refers to consuming less amounts of energy, while energy efficiency refers to the use of energy smartly and methodologically. Considering the rise of warnings about climate change, we must understand the importance of trying to reduce our energy footprint in the environment. Energy efficiency is the target of reducing the amount of energy businesses consume.

To implement energy-saving techniques, businesses have the following options: a) small changes, b) low-cost investments and c) good investments. The ideal form should be to start with simple initiatives of decreasing energy footprint and proceed to a larger scale with investments in compliance with the adapted legislation and policies for enterprises.

Small changes may include switching off your electronic devices, reduce the use of paper, start of using more emails rather than fax documents, close the shades in the early morning and late evening to reduce the heat emissions from the sun, when it is possible, turn off the air conditioning for the last hour of work and also try keeping the room in temperature of 18 degrees during winter and 25 degrees during summer. Moreover, you can use blowers or hand sweeping for cleaning purposes to save on the use of paper.

On the other hand, low-cost investments may include installing timers or thermostats that are programmed to increase efficiency of your air conditioning, while good investments are about renovating or changing old ventilators, air conditioning and devices with new, which consume less energy. (Climate, 2024)

The base of energy saving techniques and strategies involve:

- The enhanced heating and ventilation systems
- Strategies such as energy-efficient structural design
- The utilization of renewable energy sources
- Get staff involved in energy-saving planning
- Maintain buildings temperature
- Switch off office equipment

Improved heating and ventilation systems

To apply energy efficiency strategies in businesses to transform them into greener entities, there are some technical things to be considered, regarding the development of the buildings.

It is essential that the units of ventilation be able to recover heat at an efficient rate to maximize their long-term cost-effectiveness and environmental friendliness. The system of heat recovery is operating the way it sounds. It lessens the need to expand energy to provide more heat to an area by recovering and reusing the heat that already exists there. The heat is venting from one airstream to another to help keep a constant and stable temperature inside the facility, as opposed to warm temperature leaving the building, while permitting the cold to come into it. Moreover, with the installation of ventilation units with efficient heat recovery, the amount of CO2 generated from buildings can be reduced.

This way of heating structure is already implemented in Germany with approximately 2 million buildings heated by gas boilers, creating the potential of decreasing carbon emissions up to 1 million tons per year. This shows the immense impact of heat recovery structures and creates the need for building facilities or including these structures in renovating old buildings – to decrease the huge environmental impact of buildings on the environment.

By reusing and recycling heating energy, buildings can depend less on conventional energy sources and generally, this can reuse the energy buildings are consuming.

These ventilation units can be constructed with one of the three following types of counter-flow heat exchangers:

- ✓ Aluminum exchangers – including low-pressure loss, sound insulation and high air output
- ✓ Plastic exchangers – they are similar to the aluminum ones, but they demonstrate better heating efficiency
- ✓ Enthalpy heat exchangers – consist of a lower heating consistency than a plastic exchanger and also a special polymer membrane that can control the heat and the humidity at the same time. (Odgaard, 2024)

Some other simple things that businesses can consider when they want to make their activity friendlier to the environment is the fact that the appliances and devices should be energy efficient. Furthermore, smart lighting design and the use of natural light can reduce the environmental impact transmitted by businesses.

The efficient dispersion of light in a modern luminaire and reflector design has risen by up to 30% when compared to other previous models. In addition to being more energy efficient, modern lumps and luminaires offer life (up to 50%), which means less maintenance expenses.

Less heat is also produced by luminaires that utilize energy-efficient bulbs. This implies that fewer mechanical cooling systems are needed and demanded to sustain working conditions.

Many experts recommend solid-state LEDs (lighting emitting diodes), which are the way of the future for energy-efficient lighting. (*ScienceDirect.com | Science, Health and Medical Journals, Full Text Articles and Books.*, n.d.)

Nowadays, when environmental effects are becoming increasingly important, sustainability is a major issue. In this vein, it is of utmost importance to maintain building's temperatures during all seasons, by reducing energy losses and ensuring optimal use of heat from the interior space. Energy-efficient windows and doors lower energy consumption, which lowers the carbon impact of your company. Reducing your energy consumption for heating and cooling helps the worldwide effort to fight climate change and protect the environment. Greenhouse gas emissions reduction and advancement of a better future can be greatly aided by selecting items with high energy efficiency ratings and eco-friendly materials. Some tips towards that direction can be thermal isolation of walls, floors and ceilings, window and door sealing.

The utilization of renewable sources in business

Huge amounts of greenhouse gas emissions from powering the world are causing climate change, having consequently heatwaves, floods, droughts, and forest fires.

Carbon emissions need to be restrained in order to decrease the effect of global warming and dependence on conventional types of energy also needs to be limited. Oil, carbon, and gas are not unlimited on the earth. In case they are depleted to a serious extent, it takes a lot of time to be replaced. Moreover, their extensive use causes greenhouse gas emissions and carbon dioxide, contributing to global warming. Except from the urgency to decrease carbon emissions due to the deterioration of climate change, there are also some benefits for businesses to go greener.

The use of renewable energy sources or even natural gas can mitigate the environmental footprint that businesses leave.

The renewable energy sources present a lower environmental impact than fossil fuels (such as oil, coal, natural gas) that transmit carbon dioxide and greenhouse gas emissions that deteriorate global warming and consist some of the main reasons of the climate change.

The types of renewable energy sources include:

- Solar power which is produced through sunlight and is converted into electricity. The collection of sunlight is taken via photovoltaics (PV), which are solar panels and convert it into electricity.
- Wind power consists of individual wind turbines and can be produced by turbines on land or offshore wind farms over water.
- Geothermal power consisting of hot steam and hydrocarbon vapor for geothermal inventories within the earth and can be harnessed to produce electricity. Geothermal heat pumps are used to produce heat and coolness, providing also hot water.
- Biomass is renewable organic material derived from plants and animals. The chemical energy that plants make during photosynthesis is stored in biomass. Various techniques can be used to convert biomass into liquid and gaseous

fuels, or it can be burned directly for heating, creating electricity of biofuels like ethanol or biodiesel. (McGrath & McGrath, 2024)

Advantages of integrating renewable energy sources in business

- ✓ Lower energy bills. Nowadays, many businesses use conventional types of energy such as oil or natural gas. These types of energy are not indefinite and there are external factors (such as COVID-19, wars) which result in increasing prices. Investments in solar panels or wind turbines may seem costly, but in the long term, all the expenses are depreciated due to lower energy bills. Moreover, businesses can consider using small-scale turbines for low-impact hydroelectricity from the flow of rivers and water
- ✓ Lower carbon emissions. Companies not only should adopt "green solutions" to combat global warming and climate change, but also to reduce their carbon footprint and differentiate their company from others in the market.
- ✓ Improvement of public relations and creation of jobs. Due to the large extent of the matter of global warming and climate change, even consumers and investors and other partners care about adopting habits that are not harmful for the environment, and their consuming habits are also included. Therefore, many of them are interested in seeing whether their vision and goals align with the protection of the planet. (*HSBC Business Go*, n.d.)

Getting staff involved in energy-saving planning

Many experts believe that increasing energy efficiency is widely seen as the quickest, least expensive, and most comprehensive way to save money and energy at the same time, even by small business partners. You may accomplish your energy management objectives and improve office engagement by introducing inspiring and positive energy campaigns to encourage your staff to participate in energy–saving behaviors.

In order to make your employees aware of the initiatives that you want to accomplish regarding green energy transition you need to take some steps to make them engaged:

- **First of all, you need to educate them**. Make them aware of the goals of your company and teach them how to follow your green initiatives. For instance, raise awareness about energy efficient lamp bulbs and how to use effectively the thermostat without setting it excessively warm or cold.
- **Secondly, you need to make it personal.** If you explain your new green policies, your cause and the expected results, you will gain more engagement and you will make them understand the reason why you have adopted those policies, while implementing these policies will be easier when people understand the cause.
- **Thirdly, you need to upgrade your equipment.** Employees pay attention when they witness company executives making investments in energy efficient work supplies, appliances and gadgets. Such actions taken within the organization have the potential to change the culture in favor of energy efficiency.

In addition, do not forget to encourage your staff to think of innovative energy–efficient ideas for regular employees' meetings to ameliorate the green policies that you may have already adopted. (*How to Get Employees Engaged in Energy-Saving Practices*, n.d.)

ii) Waste reduction

To achieve waste reduction, it is needed to adopt waste reduction management. More precisely, waste prevention policies are crucial to mitigate the pollution problem for the environment. Various technologies can be utilized during the production, usage, or after-use phase of a product's life cycle to get rid of waste, which in return lowers or stops pollution. Innovative chemical neutralization techniques to reduce reactivity, the use of contemporary leakage detection systems for material storage, environmentally conscious manufacturing processes that use fewer hazardous or harmful materials, and water-saving techniques that lessen the need for freshwater inputs are some examples of representative strategies.

Waste reduction refers to the strategies of design and manufacturing of products or services that decrease the amount of generated waste and maybe mitigate the toxicity of the resultant waste. Waste can be reduced by reusing or recycling materials, utilizing less dangerous materials, or by altering components of design and processing. There are many benefits that are a consequence of the waste minimization strategies, such as the reduced use of natural resources and the decrease of toxic waste.

The utilization of recycled materials reduces the demanded use of raw materials in some processes. Moreover, recycling not only makes it possible to collect waste materials and turn them into valuable resource materials, but it also lessens the need to exploit natural resources for raw materials. Recycling waste immediately protects natural resources, lowers energy use and emissions from the extraction of materials and the subsequent manufacture into finished goods, lowers overall energy use and greenhouse gas emissions that fuel climate change, and lowers the number of recycled materials that are burned or dumped in landfills. Recycling also has several economic effects, such as the potential to boost employment and the economy. (Matthew R. Fisher, Editor, n.d.).

Waste reduction can be achieved with the implementation of simple steps and measures that will have a major impact in the long term. Some of these measures include:

1. **Opting for materials that are durable and are not vulnerable to early destruction leads to high endurance.** In that way, waste reduction can be accomplished as companies invest in durable, high-quality materials that withstand time, and therefore, business not only can increase their environmental impact but also avoid high costs and acquire long-term savings.
2. **Implementation of organized recycling programs**. Engaging employees with these programs and providing training, results in creating a culture of recycling with your company and this makes the employees adopt eco-friendly habits.
3. **Reduction of plastic use**. Businesses' activities can have an impact by reducing the amount of plastic they use daily. For instance, they can opt for reusable containers instead of bottled water.
4. Another important area is **food waste** that businesses should address needless waste and support a circular economy. Initiatives in this area may include training programs to teach he employees about the meaning of cooking less food than you need and donating untouched food items in the local community of your region.
5. **Organized efforts to collect and separate your company's waste.** You can use different rubbish bins for your different kinds of waste and separate them into the ones that can be recycled and the ones that don't. (*5 Waste Reduction Strategies for Businesses | Rubbermaid | R*, n.d.)
6. **Boost sustainability**. One of the main goals of sustainability is to manage energy, water, and waste more effectively. Increasing the sustainability of your company might improve its reputation.

7. **Reuse and recycling** help to preserve natural resources including water, metal, and trees. (*Managing and Reducing Wastes: A Guide for Commercial Buildings | US EPA*, 2024)

iii) Circular economy principles

Circular economy is defined as the better utilization of resources. Its main goal is to decrease resource exploitation and maximize waste prevention. The basis of the circular economy includes the acts of "repair" and "recycling" due to preoccupations about the environment and sustainability, rising inequality, and the stability of the economy. More specifically, systems that are based on circular economy, reduce waste but at the same time preserve additional value in products for as long as feasible. When a product reaches the end of its useful life, they try to preserve resources in the economy so that it can be usefully employed once more and also provide value.

Practically, circular economy needs to transform from focusing on reduced environmental impacts to preserving (zero impact) and enhancing (environmental net gains) natural capital. In fact, in the model of circular economy, the goal has shifted in a sustainable circular economy from being able to generate wealth, to being a means of allocating resources to preserve or improve environmental quality and social well-being.

Planning for recycling and eco-design, which aims to eliminate waste and limit environmental waste and limit environmental impacts, must change in order to transition from a "recycling" to a "dematerialization" circular economy. Materials, products, supply chains and industrial systems must be modified to create a sustainable circular economy that can produce net-gains for society and the environment while preserving economic prosperity. This evolutionary viewpoint demonstrates that the adoption of a circular economy is an ongoing process that

requires refinement, one that involves monitoring and evaluating sustainable practices. (Velenturf & Purnell, 2021)

In continuation with the "reduce, reuse, recycle" model that has been presented, the circular economy adds another element: recovery. By recovering we refer to the practice of reclaiming materials or energy from products that can no longer be reused or recycled. These products can vary from composting organic materials and waste to producing energy.

Difference between linear and circular economy:

In contrast to the circular economy, the linear model of economy is based on withdrawing, fabricating, consuming, and throwing away. This type of economic model consists of the extracting and transformation of resources, raw materials, creating new products that will not last long and later they will be thrown away. These kinds of activities demand a high energy intensity which results in polluting the environment with high amounts of greenhouse gas (GHG) emissions.

A difference between the two economic models is the way resources are being exploited. In the linear economic model, resources are mostly used to produce single- products, whereas in the circular economic model, there is a system to reuse, repair, and recycle the products being manufactured, with low emissions. Moreover, the circular economic model seeks to strengthen a supply chain's persistence and have positive long-term effects, unlike the linear economic model which targets short-term profits.

The circular economy is based on three basic principles:

- Eliminate waste and pollution
- Circulate products and materials (at their highest value)
- Revivify nature

Elimination of waste and pollution

Eliminating waste in the field of businesses specifically can be linked with reviewing how resources are used in every stage of a product's "life", from manufacture to disposal. In this way, companies could use recycled materials, rather than raw materials, designing products with flexibility, in order to be able to be altered more easily and opting for methods that do not produce leftovers.

Circulation of products and materials

By manufacturing products that you know will return to you, either as reused, refurbished, or recycled accordingly, or even creating a market for your products where their lifespan is extended beyond their initial use.

Revivify nature

Engagement in the circular economy is not only about reducing the negative effects on the environment but rather thinking about restorative methods and practices to enhance biodiversity. Practically, this means that businesses should focus on adopting policies that include investments in soil health, cleaner water, and better air quality.

When applied in business, there are 4 basic practices:

- Reduce: keeping to a minimum rate the waste and prioritizing sustainability
- Reuse: extending the lifespan of one product or thinking of other ways you can use it.
- Recycle: it's the reusage of products, or the use of some parts of a product to create new ones

- Recover: taking energy from materials and products that are no longer in use and composting organic materials and capturing energy from waste. ("Get Acquainted with the Core Principles of a Circular Economy | Inogen," 2024)

The implementation of circular economic model can bring positive outcomes in businesses. These benefits are divided into:

- Environmental benefits: Circular economy contributes to waste reduction having as a result a decrease in pollution and greenhouse gas emissions related to waste disposals. The conservation of resources, with keeping the products in use for as long as possible is extremely important in protecting biodiversity and combating resource depletion.
- Social benefits: Local recycling can contribute to fostering community ties and a sense of responsibility for a common cause, the protection of the environment. Additionally, through circular economy innovation is being cultivated. Innovation is an integral part of developing sustainable product design, systematic resource use and well-organized waste management techniques.

Consequently, the circular economy is not only about recycling, as many people believe, but it is also about lengthening a product's life span and reducing the use of resources. Therefore, it is not only about ameliorating the waste management system but also rescheduling the whole concept of product design. Moreover, there is a belief that circular economy is costly for businesses. However, investments to transform your business into a circular economy may present many opportunities and it is actually cost saving in the long term. However, as much as you try to decrease the use of raw materials, there is always going to be a need for them and for some activities to operate correctly.

The European Union has also proposed some measures on how to achieve a circular economy, which has evolved over the last decade. Specifically, in 2015 when the first Circular Economy Action Plan was introduced. This plan included 54 measures to accelerate and secure the transition to a circular economy. This legislation was revised in 2018 and in 2020, defining long-term targets and a plan for modern waste management. Some of these measures focused on goals about

recycling municipal waste, binding targets to reduce landfill management waste and ways to reduce food waste and litter. (*Circular Economy - EUR-Lex*, n.d.)

Energy audits and assessments

To begin with, an energy audit is an assessment of the energy consumption, systems and equipment and by conducting these audits it helps you address the areas where your energy is not widely consumed. Energy audits can include analysis of electricity and natural gas usage, and may include lighting, heating and cooling systems, building envelope and insulation, appliances, refrigeration, signage, windows and doors even landscaping. (Greenerwebsite, 2024).

Business energy audits focus mostly on the internal aspects of energy production, such as HVAC, lighting, and machinery. There are also many different types of energy audits. These vary from:

- The assessment of energy bills and utility data regarding building/ equipment analysis
- Evaluation of the working conditions
- Measuring an estimation of energy saving potentiality.
- Developing a strategy for carbon reduction
- Giving energy efficiency solutions

Aims of energy audits

The main goals of why businesses should conduct energy audits are in order to raise awareness about energy consumption and waste to improve energy efficiency, reinforce energy management system that assists your company's objectives, and save money and energy for your company. Moreover, not only do you need to make your company comply with environmental regulations, but also you need to establish common values about environmental protection and enhance your reputation. In this way, your company will avoid future troubles regarding environmental regulations, and you will have established sustainable values that bond your company with your customers. (*ENERGY AUDITS: WHAT YOUR BUSINESS NEEDS TO KNOW – Net Zero | ESOS | SECR | Energy Audit*, n.d.)

Even small and medium enterprises (SMEs) will have to conduct energy audits if there is important energy potential. Under the revised EU directive (2023/1791) member states will need to ensure an appropriate level of energy skills, connecting them with the market needs to comply with the current regulations regarding energy efficiency. In their skills and competencies, they will need to incorporate well educated energy auditors, energy services providers, energy managers and providers. In this way transparency and accountability are secured and promoted.

There is also the Energy Efficiency Directive (2023/1791) from the European Commission, which demonstrates “energy efficiency first” as a fundamental EU policy principle. This principle presents the need for all EU countries to consider energy efficiency in relevant policies or investment decision regarding energy sectors. This directive sets the binding goal of ensuring that member states reduce their energy consumption by 11.7% until 2030. Another target that the directive sets that it raises the annual energy savings obligation by 2028. This directive also enhances energy poverty, as there are posed more demanding requirements for EU countries to inform consumers about energy efficiency.

Regardless of the size of the company, the directive proposes energy audits to promote energy efficiency and saving. Any kind of improvement could be identified and implemented by auditors which reduce the time of work, by emphasizing specific areas and investing in suitable solutions. Arguably, energy audits are becoming increasingly popular among individuals and organizations, for identifying energy saving opportunities, understand a business’ energy usage and ways to improve it and helping them identify how to reduce carbon monoxide production in their businesses.

(*Energy Efficiency Directive*, European Commission, n.d.)

Worldwide companies can conduct energy audits

QOS energy powers qantum is a company which helps other companies to make their transition to green energy, using renewable energy sources, conducting energy efficiency audits and assessments, and ither activities related to green energy transition. (*Harness the Power of Renewable Data - About Us - QOS Energy*, 2022)

Another worldwide company that conducts energy audits is Conserve Solution company. As some experts of the company support, the energy efficiency audits are significant for the operation of companies in general for the following reasons:

There are huge energy saving costs and this company specifically provides its customers with detailed analysis of the costs, reducing at the same time the environmental impact. Moreover, some regulation and laws like ISO (International Organization for Standarization), demand energy audits for some activities. (Nehruji, 2023)

Sustainable supply chain

To begin with, a supply chain is a series of businesses including suppliers, customers, and logistics providers, who all work together to deliver products and services to customers. Enhancing the efficiency of material management, which is the collection of business procedures that support the entire circle of material flows from the procurement and internal control of production materials to the scheduling and management of work in process and storage, transportation, and distribution of final goods, is crucial to supply chain performance. To enhance their effectiveness in materials management, managers must first comprehend how their choices affect the procurement, handling, storage, and asset recovery processes across their entire company. (Markley & Davis, 2007)

Due to economic and environmental challenges, many companies and organizations opt to transform their supply chains to a more sustainable one. However, many organizations find themselves in a dilemma, short-term profitability or long-term environmental sustainability. In this way, nowadays environmental, economic, and social issues are interconnected. Sustainability means that businesses' activities

should focus on and preserve natural resources and the environment, and thus make it part of their priorities.

This is because sometimes the managers lack sufficient information regarding the protection of the environment in conjunction with decision-making. They consider that there is uncertainty regarding environmental outcomes and future regulations.

Moreover, managers tend to take short-term decisions that promote the profitability of the company. (Wu & Pagell, 2010)

However, sustainable supply chains sometimes are distracted because there are no appropriate regulations, or sustainable supply chain performance measures and the demand for sustainable products in some regions is limited, and this restrains the ability of businesses to engage in sustainable supply chain activities.

Performance measurement in supply chains is very important because it involves interaction with the supplier, the manufacturer, the distributor and the retailer. Moreover, some researchers support that many people do not have the time to search for more sustainable products, they have higher prices, and most of the time, insufficient information discourages consumers from opting for green products. (Sajjad et al., 2015)

Furthermore, due to the danger that our natural system faces, businesses may profit from converting their supply chain to a more sustainable one. As the world is developing and as people's capabilities and income increase, they will become more environmentally concerned and will need companies that retain their environmental standards. Some ways in which they can achieve this are by promoting waste minimization, a greener product design, and technology cooperation in the modern, developing world. In this way, if businesses transform their supply chain to a sustainable one, they can acquire a comparative advantage over others, satisfying consumer's needs.

Some researchers have found that there is a strategy called 3BL (3 bottom line) where a business' performance is measured by social, ethical and environmental activities. In this way, companies ameliorate processes, decrease costs, increase productivity, innovate, differentiate, and develop societal outcomes. (Markley & Davis, 2007b)

There are eight ways in which you can improve your company's supply chain:

- Find any sustainability issues with the supply chain. It is important to break down the pieces and identify parts that can be improved
- Adopt a circular supply chain. This targets to eliminate waste or at least reduce it and could be achieved by recycling the products and then sending them back to the manufacturer for reusing them
- Evaluate the quality of the materials, take into account UN Global Compact principles
- Regulate resources, structures, and processes to concertante to supply chain sustainability.
- Educate managers and suppliers on market practices
- Make investments in inclusive and diverse supplier chain partners
- Use technology to increase accountability and transparency
- Engage suppliers. It is important to encourage and reward positive attitudes toward sustainability (Gatley, 2021) (*Eight Ways to Boost Sustainability in Your Supply Chain*, 2019)

Carbon footprint calculators

Carbon footprint calculators were developed to quantify the impact and the damage we cause to the environment, regarding greenhouse gas emissions and thus encourage a more sustainable way of life. Over the years, many different calculators have been adopted, in different countries but also globally, measuring different fields of actions that leave carbon footprint. Some of them are the Global Footprint Network and the carbon footprint calculator of the United Nations, while there are others that focus on specific business areas such as Terrascope, which has expertise in the agriculture sector. These calculators measure some of the user's habits such as diet, transportation, and energy consumption among others, and then they receive feedback on the impact these activities leave on the environment in terms of Carbon Dioxide Equivalents (CO_2e) per year. In addition, some of them provide tips and advice on how users can reduce their carbon footprint in the environment, while other carbon calculators just inform users about their impact and leave them to make their own choices in terms of a reduction of their climate impact. Therefore, the main purpose of these calculators is not just to provide

numbers, but rather to provide feedback and advice to individuals and businesses, which will help them reduce their impact and adapt to sustainable habits. (Biørn-Hansen et al., 2022)

The carbon indexes may also be governmental, non-profit, or private. For instance, governments may manifest indexes for their regulatory frameworks to monitor national or sectoral greenhouse gas emissions. These indexes contribute to making people comply with environmental standards, set carbon prices or even steer public policy.

As the concern about climate change increases, we have seen that many businesses are and should become more environmentally concerned. Therefore, the use of carbon footprint calculators can contribute to aid companies to reduce their carbon footprint and opt for more environmentally friendly solutions. The concept of carbon footprint gauging the quantity of greenhouse gas emissions that are connected to a specific activity (directly or indirectly). The corporate level of carbon footprints can be illustrated as the total amount of carbon emissions in relation to the activity and the products being produced from the companies.

Most of the carbon footprints can be measured in big units (in kilograms or tones) of carbon dioxide and the calculation of carbon footprints at a corporation level can be beneficial for many different reasons. Some of them include:

- Identifying fields in the accounting system, in which intervention will be useful for cost savings
- Managing cooperations with other functional parts of the company
- Receive internal and external data regarding the impact of carbon one company leaves on the environment
- Provide motives to employees as a company that is environmentally concerned
- Improve your company's image

There have been developed many different frameworks on how to measure carbon emissions and here are mentioned three scopes in which emissions are ranked:

- The first scope is related to direct emissions from sources which are processed by the organization (for instance, owning trucks, gas heating systems etc.)
- The second scope involves indirect greenhouse emissions from electricity and heat and
- The third scope relates to the phases of product lifecycles

It is also proved that most of the amount of carbon footprint emission is derived from indirect emissions (*Proceedings of MAC-MME 2016*, Group of authors n.d.)

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