Chapter 6: Chemical and Pollution Reduction in HoReCa

Introduction

This is the sixth module of the Zero Waste in HoReCa Curriculum. This module addresses the topic of reducing chemical use and pollution generation in the HoReCa sector. This chapter will examine the presences of chemicals in many of the activities carried out by businesses in the HoReCa sector, looking at why we should reduce chemical use. We will also explore the best methods to reduce chemical consumption in a change of practice approach and will also briefly look at the environmental benefits of ecolabels. The second part of this chapter will focus on pollution, outlining what is pollution and how HoReCa organisations can reduce the pollution generated by their business. Finally, this chapter will look at carbon foot printing, giving some guidance on how to measure it and what benefits HoReCa businesses could experience from carbon foot printing.

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Objectives

Once you have read through this chapter and completed this short unit on Chemical and Pollution Reduction in the HoReCa industry, you will have achieved the following objectives:

- *You will learn the importance of reducing chemical use, and the various ways to manage the use of chemicals in a HoReCa business.*
- *You will gain an appreciation for ecolabel products and their benefits on the environment.*
- *You will gain an understanding of what pollution is, and how it is in generated.*
- *You will have an increased comprehension of direct and indirect behaviours in HoReCa that affect pollution.*
- *You will recognise the benefits of carbon foot printing and understand the methods used to measure the carbon footprint of an organisation, product or service.*

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Unit 6.1 - Chemical Use in HoReCa

Unit 6.1.1 - Presence of chemicals in HoReCa activities

We have been combining raw materials to produce new chemicals and materials for thousands of years. Natural resources like air, water, minerals, oil, natural gas and metals have been mixed in many forms to create a vast array of everyday items, such as: clothing, food and beverages, cleaning products, hygiene products, decorating materials etc (EcoTourismKenya, 2020). The list of products that contain chemicals goes on and on, and chemically enhanced produces saturate the market across multiple sectors, including the HoReCa industry. The most common aspects of chemical use in HoReCa businesses are food and beverage production, cleaning and laundry services.

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Food and Beverage Production

Traditionally when we think of chemicals, harsh chemicals used for cleaning, decorating, or scientific discovery come to mind. However, **chemicals are widely used in the production and transportation of food and beverages** (European Court of Auditors, 2019). The presence of chemicals can occur in four ways: regulated use, supply chain residuals, packaging, and contaminants.

EU regulated chemicals like food additives, flavourings and enzymes are used to enhance food flavour and appearance, and to extend the shelf-life.

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Unit 6.1 - Chemical Use in HoReCa

Unit 6.1.1 -Presence of chemicals in HoReCa activities

Chemicals are also used in various packaging materials to ensure the product remains fresh and is undamaged during transport. In terms of supply chain residuals, medicines for livestock, pesticides and feed additives are also potential contributors to chemical consumption. Finally, chemicals are also found in naturally occurring contaminants, environmental pollution and contaminants arising during processing (European Court of Auditors, 2019). Looking at a cup of coffee as an example, there are three steps in the production process that have the potential for chemical contamination: 1) residual pesticides used to help the plant grow, 2) environmental contaminants from the present of heavy metals in the soil the plant was growing in, 3) processing contaminants in the roasting/grounding of the coffee beans.

(European Court of Auditors, 2019)

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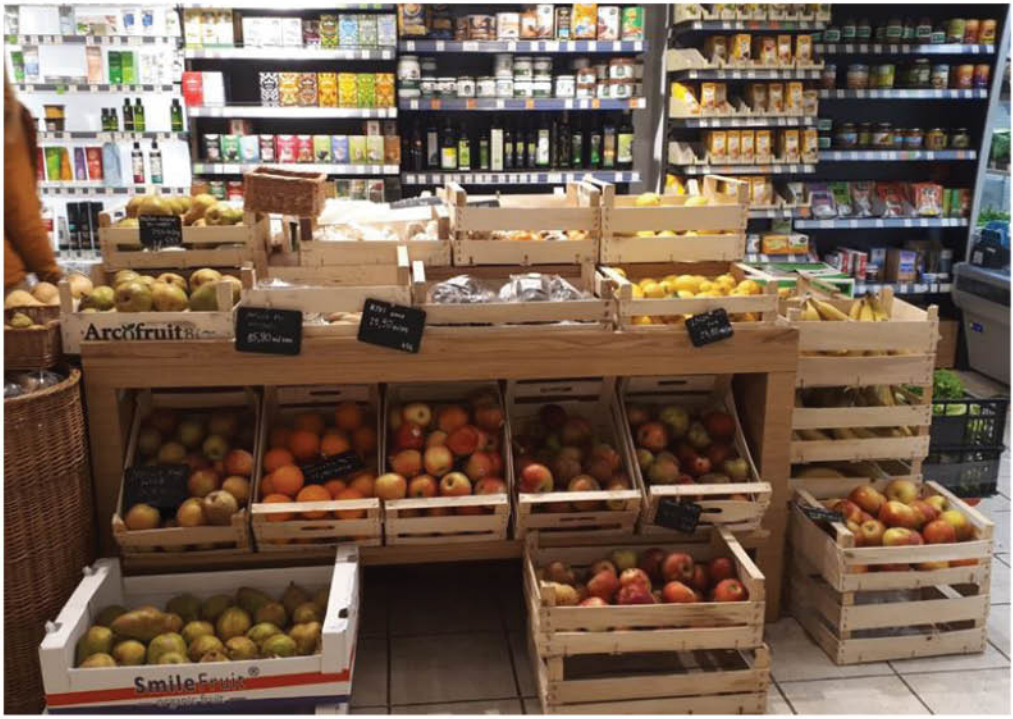
The European Union is highly committed to ensuring the safety of the food and beverages its citizens are consuming. There are substantial regulations put in places for all foods produced within the EU, and for the food items that are coming into the market from outside of the EU. However, a study conducted by the European Court of Auditors (2019) found that there are considerable stresses on the model set out by the European Union, and not every member state is able to monitor the food entering their country as exhaustively as the strategy suggests. This leads to increased risks of chemical hazards in food and beverages, which have a serious impact on the health of consumers.



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Cleaning and Laundry Services

A significant amount of chemicals are used in the cleaning of guestrooms and bathrooms in establishments providing accommodation. A study conducted about the use of chemicals in hotels found that chemicals are often used well in excess of the manufacture's recommendations (Leslie, 2016). According to Leslie (2016), the reasons for this were to reduce the time needed for cleaning while also achieving higher levels of hygiene.

Excessive use of chemicals has also been noted in laundry practices as well. Chemical dosing for laundry should coincide with the volume of laundry and the weight of the materials. Not only is there a wastage of detergent, but overuse of chemical detergents results in the need for extra water for rinsing, meaning there is more water wastage as well.

(European Commission, 2013)

Other Forms of Chemical Use in HoReCa

The production of food and beverages, and practices involving cleaning and laundry tend to be the most chemical intensive activities of HoReCa businesses. That being said, there are other activities that contribute to chemical consumption. **Leisure facilities like massage treatments, indoor and outdoor swimming pools, and steam rooms or saunas all require considerable chemical use in the application or maintenance of these services. Textiles, like towels and bed linen, can also add to chemical consumption**, depending on the make-up of the materials and the colour. Lastly, HoReCa businesses use chemicals in their pursuit of setting a nice atmosphere for their guests or customers. Air fresheners to mask smells in guestrooms or bathrooms and paint used to decorate customer areas are just some instances of this.

(European Commission, 2013)

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Unit 6.1.2 - Why reduce chemical use?

From the food that we eat to the spray that we use to clean the windows, it is clear that chemicals are present in a variety of products used, practices followed, and services offered in HoReCa businesses. What remains to be seen is why we should try to change this? Our bellies are full, and our windows are sparkling, so there is an element of "if it isn't broken, don't fix it". However, it is impossible to ignore the implications of being so heavily reliant on chemicals in the HoReCa sector, this being the impact on the environment and the impact on health.

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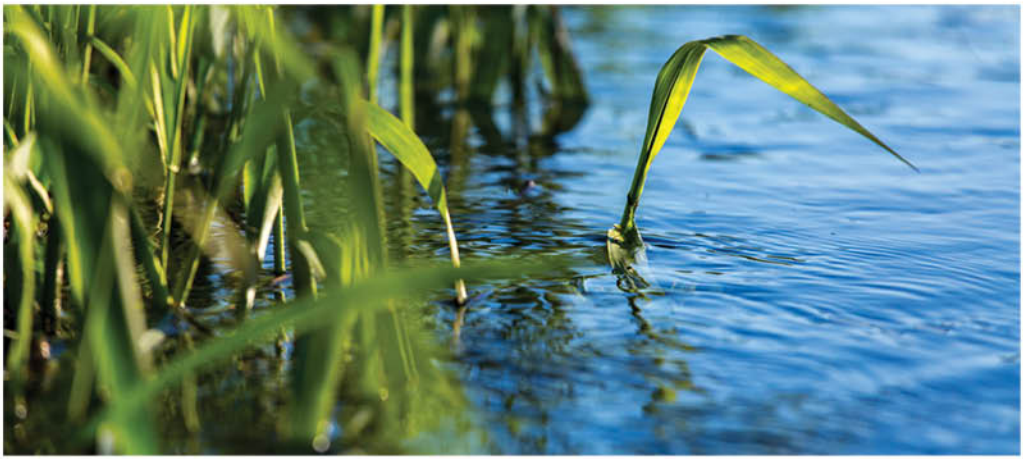
Environmental Impacts

The chemical industry is one of Europe's largest manufacturing industries, relying on finite resources to create new materials for further manufacturing or end use by consumers (European Commission, 2020b). **The production of these materials in large industrial plants adds to air pollution in the form of carbon emissions.** Depending on what the chemicals are being used for, once in their consumable phase they may be adding to further pollution of land and water. For example, look at chemical products used for cleaning. We have already discussed the overuse of chemicals in this area, but what happens to the waste? More often than not, wastewater from cleaning is flushed down the drain. How is this being treated, or is it returned to nature in this state? The answers to these questions will affect the impact these chemicals will have on water pollution (EEA, 2019a). Another example of environmental impacts can be seen in the case where chemicals were added to packaging for improved shelf life. We know from chapter four that these increasing complex materials are harder to recycle. This means the chemically enhanced packaging could end up in a landfill, further adding to land pollution.



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Unit 6.1 - Chemical Use in HoReCa

Unit 6.1.2 -Why reduce chemical use?

Effects on Health

Chemical based cleaning products are one of the most hazardous products in a HoReCa business. **Used daily, cleaning products like detergents, polishes, surface cleaners etc can be harmful to health** (European Commission, 2013). For example, if continuously coming into contact with the skin, cleaning products can result in contact dermatitis which can cause sever discomfort and pain for the sufferers. When considering the effects on chemicals on our health, we tend to think of the more obviously absorbed substances like harsh chemicals on the skin, or the fumes from cleaning products, or the additives used in foods. However, there are instances where the chemicals are being ingested without our knowledge.

Research has shown that medicines given to livestock like antibiotics, can still be present in the end products that consumers ingest. Worryingly, this can build tolerances in the body for anti-biotics, meaning the effectiveness of anti-biotics when needed would be lessened.

(European Court of Auditors, 2019).

There are other instances similar to this one, where hidden chemicals are harming the health and wellbeing of people. The most alarming case of this is dust. A study to examine the occurrence of chemicals in household dust found that harmful chemical particles were present in 90% of dust sampled. Chemicals are released into the air and settle as dust on items in the house, where later adults and children can inhale small particles or absorb them through the skin (NRDC, 2016). The same study examined the types of chemicals present and determined that these chemicals are often linked to respiratory issues, immune system and digestive problems, and in some cases cancer.

(NRDC, 2016)

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Unit 6.1.3 - Managing chemical use

There should be no doubt that there is a need to reduce chemical consumption across the board, but how can businesses in the HoReCa industry achieve this. There are two steps businesses can immediately take to reduce consumption, the first is a change of everyday practices, and the second is to monitor chemical use.

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Change of Practice

We briefly discussed that there are some practices carried out by HoReCa businesses that add to the consumption of chemicals. However, there are a number of quick action steps that can be taken to combat this. Figure 6.1 of this chapter outlines a variety of steps that can be taken in the cleaning, laundry and management of amenities processes in a HoReCa business (European Commission, 2013). **Efficient cleaning alone can reduce chemical consumption by at least 50%, and significantly reduces water consumption by as much as 25%** (European Commission, 2013).

Figure 6.1 *Change of Practice Suggestions*

Activities	Change of Practice
Efficient Cleaning	Turn off taps during cleaning
	Use microfiber cloths and mops
	Use a single flush of 3 litres on a dual flush toilet when cleaning
	Dilute concentrated cleaning products according to the manufacturer's instructions – it is important to note that dilution volumes may need to be adjusted based on the hardness of water
	Avoid the use of fragrances and air fresheners where possible
Laundry	The dose of chemicals used should be measured to the volume and material make-up of laundry
	Pre-treat or "spot" stained materials with stronger chemicals like hydrogen peroxide
	Use detergents that work at lower temperatures
Amenities	Maintain the appropriate temperature of a swimming pool through optimised management, thus reducing chemical consumption
	Convert existing outdoor swimming pool to a natural pool through the installation of natural plant-based filtration systems

There are some methods that can be employed by management to ensure that the efficient cleaning and laundry practices set out are achieved. A simple example of this is the clear indication of fill levels on cleaning equipment like spray bottles. This prevents the overuse of chemicals and works to reduce the occurrence of incorrect dilution of chemicals too (European Commission, 2013). Another example of this may be the installation of chemical dosing units. Large scale washing machines used in the laundry service of hotels regularly have in-built dosing options. However, for smaller operations using standard washing machines, chemical dosing units can be retrofitted. This will enable the use of more precise volumes of detergents and conditioners.

(European Commission, 2013)

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Employee Training

Staff training is crucial to the success of these changes in practice. The European Commission (2013) has identified three areas in which training should be given to employees of HoReCa businesses: safe handling of chemicals, efficient cleaning, and chemical management. Furthermore, it is also recommended that a safety data sheet is created, listing all chemical products and outlining their correct usage and dosage (European Commission, 2013). For businesses with employees coming from different parts of the world, it is vital that this information is displayed in all employee languages.

Monitoring Chemical Use

Effective chemical management calls for the monitoring of chemical use (European Commission, 2013). According to a report by the European Commission (2013), accommodation providers are required to submit a statement that outlines their use of chemicals, both ecolabel and non-ecolabel varieties, if they wish to comply with EU ecolabel criteria. Therefore, while it is a necessity for some accommodation providers to do this, it makes sense that all businesses in the HoReCa sector keep an account of their chemical use. **In implementing a monitoring plan for chemical use, the business will be able to examine the effectiveness of chemical reduction strategies and keep an account of any potential savings to the business. Monitoring chemical use can be achieved in three easy steps** (European Commission, 2013):

1. Make a list – List all types of chemicals used, the quantity purchased, and note if they have an ecolabel or not.

2. Create a plan – Set measurable targets to reduce consumption and consider environmentally friendly alternatives.

3. Involve employees – Train staff regularly, focusing on chemical management, efficient cleaning, and health and safety. If needed, identify one employee that will be responsible for creating data sheets with safety information and correct procedures for chemical use.

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Benefits of Chemical Reduction

Combining the advice provided in this section, appendix 6.1 of this chapter provides HoReCa businesses with a checklist of actions to help reduce chemical use. There are considerable benefits to businesses in pursuing this goal. **In additional to the environmental benefits and the safeguarding of the employee health, there are considerable cost benefits involved in chemical reduction strategies.** Chemical products contribute a great deal towards consumable costs, so it follows that reducing the volume used will result in direct cost savings for the business.

(European Commission, 2013)

Unit 6.1.4 - Ecolabel products

What are ecolabel products?

Reducing chemical use will have significant impacts on the environment, and regular monitoring by managers will enhance the success of such strategies. Nevertheless, more can be done to reduce chemical consumption in HoReCa establishments, and this relies heavily on green procurement of ecolabel products.

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Ecolabel products are so named because in their production and lifecycle they have substantially lower effects on the environment than their conventional counterparts (European Commission, 2013). There are a variety of ecolabel images used to inform consumers that the product is environmentally friendly. ISO certified ecolabels like EU Ecolabel, Blue Angel and Nordic Swan examine products in a range of ways: energy consumption, ecotoxicity, cleaning effectiveness (European Commission, 2013). It is suggested that products carrying these ecolabels are the leading environmentally friendly products that offer high cleaning performance. The EU Ecolabel has now certified over 78,000 products, ranging from cleaning products to decorating materials to tissues and textiles.

(European Commission, 2013)

Changing to ecolabel products

What is the impact of choosing these ecolabel products on the environment? The European Commission (2013) examined the most important criteria that are required for ecolabel products, and the benefits to the environment in choosing ecolabel products. Focusing on cleaning and hygiene products, textiles and toilet paper, the findings are outlined in figure 6.2. **In most cases, the impact of choosing ecolabel products means a decrease in air and water pollution, reduced human toxicity and harm caused to ecosystems, and a reduction in the generation of waste.**

(European Commission, 2013)

There is often a stigma associated with changing to ecolabel products, this being the cost of these products. Research has shown that the slight increase of cost in moving to ecolabel products will have a quick return on investment in the form of reduced waste costs. There are also some cases where the local authorities give monetary dispensation to organisations that have employed a green policy, included in which is a move to ecolabel products.

(European Commission, 2013)

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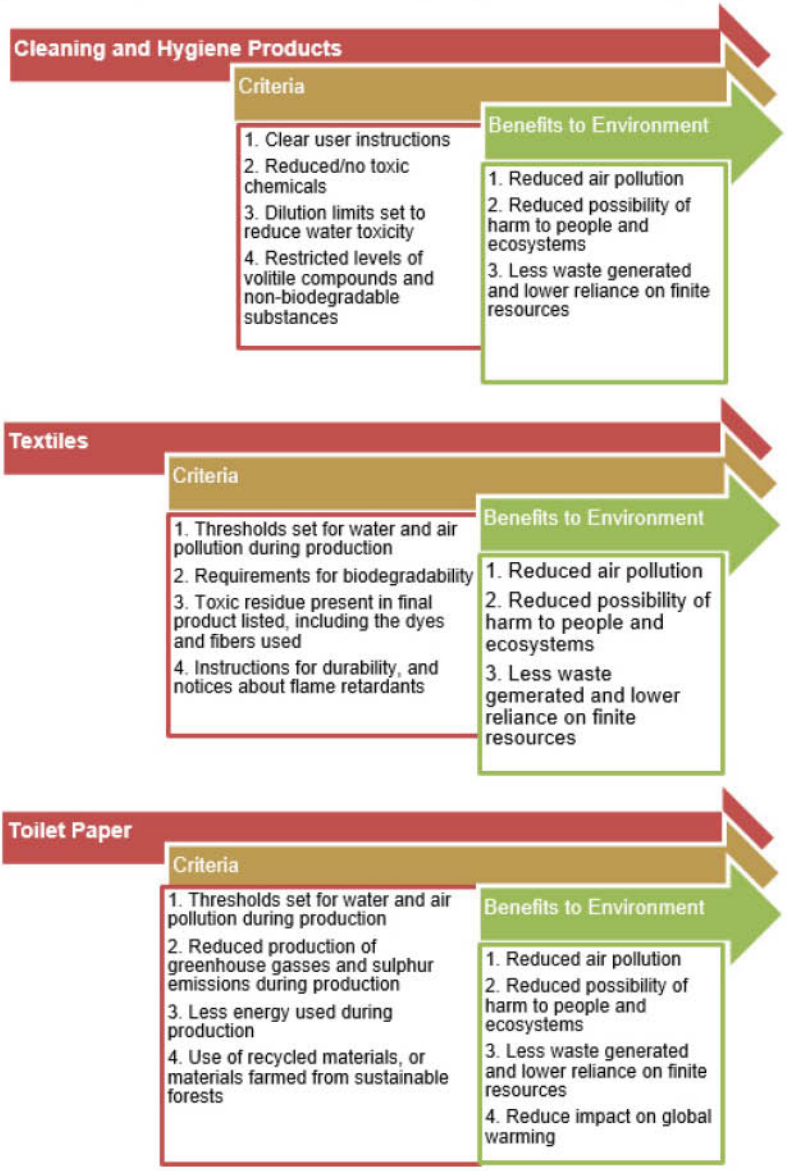
Unit 6.1 - Chemical Use in HoReCa

Unit 6.1.4 -Ecolabel productsuse

Figure 6.2 – *Impact of Ecolabel Products (European Commission, 2013)*



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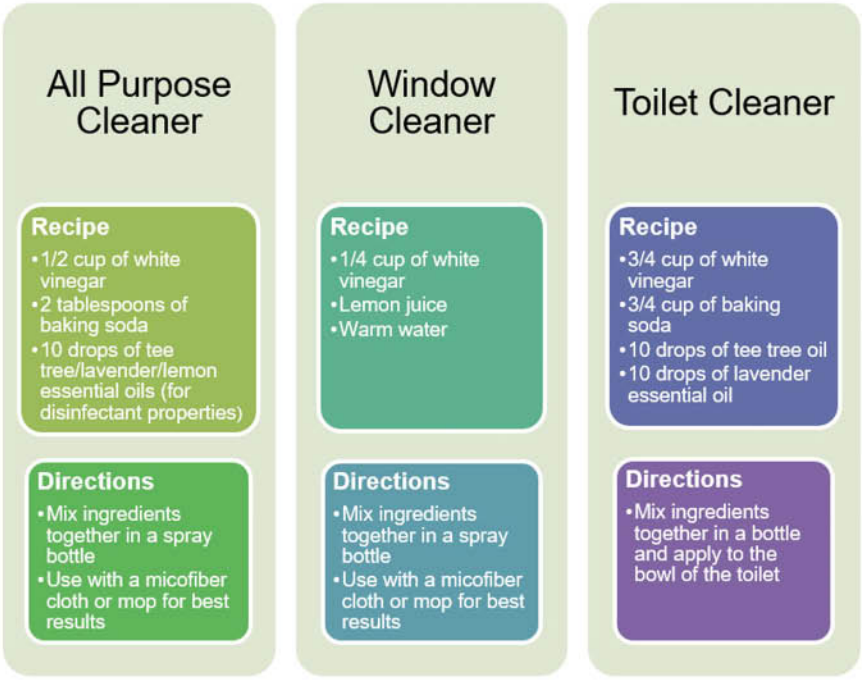
Green Alternatives to Ecolabels

Although it is widely recommended that ecolabel products replace the more conventional chemical brands, there are other alternatives that will reduce chemical use. **Homemade or traditional cleaning recipes boast significantly less chemical use with the same cleaning power. Staples in the home like vinegar, lemon, baking soda, and essential oils can clean almost anything** (Keeper of the Home, 2017). Some recipes for homemade cleaning products are detailed in figure 6.3 (The Green Parent, 2020). While these recipes may be useful in the home, it is important that HoReCa businesses bear in mind the health and safety regulations outlined by HACCP when choosing their eco-products.

Figure 6.3 – *Homemade Cleaning Recipes (The Green Parent, 2020)*



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Unit 6.2 - Pollution in HoReCa

Unit 6.2.1 - What is Pollution?

Before we examine pollution and its generation in the HoReCa sector, we must first establish what is pollution, and what are the impacts of pollution on our planet. So, what is pollution? **Pollution is defined as the introduction of harmful and poisonous substances, called pollutants, into the environment** (National Geographic, 2020). Naturally occurring events like a volcanic eruption can create natural pollutants like volcanic ash and gasses. However, the majority of pollutants that are causing adverse changes to our planet are a result of human actions, such as: burning fossil fuels for electricity or transport, waste management and disposal, and the emissions from chemical, industrial and agricultural industries (National Geographic, 2020). **Pollution significantly impacts the water, air and land around us.**

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Air Pollution

Air pollution affects our environment in many ways. **Pollutants in the air, called greenhouse gasses, are incredibly harmful to our ecosystems. Air pollution is assessed by calculating the levels of four elements found in the atmosphere: Ozone (O3), Nitrogen Dioxide (NO2), particulate matter (PM) and sulphur dioxide (SO2)** (WHO, 2020b). The effect these four elements have on the environment can differ. For example, when sulphur dioxide and nitrogen oxide mix with moisture in the air, they create something new – acids. These acids later return to the earth in the form of acid rain, and usually in a location far removed from where it was generated. Research has shown that acid rain can devastate forests as well as lakes and water streams.

(National Geographic, 2020)

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Unit 6.2- Pollution in HoReCa

Unit 6.2.1 -What is Pollution?

Aside from the effect on the environment, one of the most prominent impacts of air pollution is on our health. While the reduction of air pollution has been the focus of many policies at EU and global levels, toxic levels of pollution still remains in the air that we breathe. According to a study conducted by the World Health Organisation (WHO) in 2016, 556,000 premature deaths in Europe were the result of both ambient (outdoor) and household air pollution (WHO, 2020a). A combination of sunlight, sulphur dioxide and nitrogen oxide create what is known as 'smog'. This brown thick fog sits in the air like a haze of air pollution, impacting the effectiveness of sunlight and increasing the respiratory issues of people living in the vicinity of smog.

(National Geographic, 2020)

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Water Pollution

The Earth is made up of over 70% of water; 96% of that water is in our oceans, 2.5% of it is fresh water in lakes and glaciers, and the remainder is moisture in the air (National Geographic, 2020). Bearing this in mind, we are in an age where fresh and clean water is a scarcity due to climate change and pollution. Research by the United Nations found that approximately 4,000 children die every day as a result of drinking unclean and unsafe water (National Geographic, 2020). **A report by the European Environment Agency (EEA, 2019) stated that all four of Europe's seas are heavily polluted. Most water pollution is caused by human activity. Runoffs from industrial and chemical factories, untreated sewage and oil spills are just some examples of human activities that contaminate our waters.**

(EEA, 2019)

Plastic is another common contributor to water pollution. Dumping in the oceans has led to the development of phenomena like the Great Pacific Garbage Patch (National Geographic, 2020). Plastic is also detrimental to the health of marine life. Decomposing and microplastic fibres are ingested by marine life in the seas and oceans. In some cases, people are later ingesting these pollutants through their food.

(National Geographic, 2020)

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Unit 6.2- Pollution in HoReCa

Unit 6.2.1 -What is Pollution?

Land Pollution

Like the generation of pollution in air and water, human activities contribute considerably to the pollution of the land, and more specifically the soil. For example, the use of chemicals, like pesticides, and fertiliser can greatly affect the ecosystems around them. Pesticides are commonly used in the agricultural sector to kill insects that may impact the growth of crops. However, these chemicals are harmful to plant life, animals, and people who may be ingesting it when eating the very fruit or vegetable it was used on to help grow (National Geographic, 2020). Another regular contributor to land pollution is rubbish and landfill sites. Littering, or the dumping of rubbish in an un-sanctioned site increases the pollutants in the soil. In addition to this, landfill sites that are not correctly sealed off can contaminate the soil around them.

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Unit 6.2.2 - Reducing pollution in the HoReCa industry

There is no doubt that pollution is devastating the environment. We know that, for the most part, human activities are the leading force in the creation of pollution, whether these activities are carried out by the individual, an organisation, or a whole industry. The time for change is here, and it is vital that organisations in the HoReCa sector join the fight against pollution too. In a study conducted to measure the effects of tourism on pollution, global tourism was accountable for 8% of global greenhouse gasses (Lenzen et al., 2018). With tourism expected to grow by 4% each year (Lenzen et al., 2018), the impacts of tourism on pollution will only be lessened if organisations in this sector change their behaviours. To get a full understanding of the pollution creation for different aspects of HoReCa businesses, it is important to first note that there are both direct and indirect behaviours that can cause pollution.

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Direct Behaviours

Direct behaviours that impact the creation of pollution are the actions taken by an organisation that can be fully influenced by the business owner or manager (European Commission, 2013). **We have already seen some examples of direct actions that impact the creation of pollution, namely energy consumption and product procurement.**

The production of fossil fuels for consumption as well as their use in the generation of energy accounts for 80% of Europe's greenhouse gasses (European Commission, 2020a). In chapter five, we explored the relationship between energy consumption and the various processes in a HoReCa business, and established a range of actions that can be taken to reduce the consumption of energy, such as: setting controls on lighting and heating systems, insulating and energy proofing the building, using energy efficient appliances, and streamlining practices with the intention of reducing energy consumption. Moreover, **the most significant step a HoReCa business can take to reduce pollution is to switch from finite resources to renewable resources for their energy.** Renewable energy produces no greenhouse gasses, so a move to generating energy from renewable sources instead of fossil fuels will infinitely reduce the carbon footprint of a HoReCa organisation.

We have also briefly explored the concept of food miles (chapter 1), this being the term that refers to the greenhouse gasses created in the production and transportation of food. **Research shows that food production alone accounts for 26% of greenhouse gasses (Ritchie, 2019). While the generation of these greenhouse gasses** is done elsewhere and not a direct result of decisions made by the organisation, the purchasing of products with excessive food miles is deemed to be a direct behaviour that contributes to pollution. **It is important that chefs/purchasing managers/ owners understand the carbon footprint of the produce they put on their menus.**

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Unit 6.2- Pollution in HoReCa

Unit 6.2.2 -Reducing pollution in the HoReCa industry

Did you know that 1,260 litres of water are needed to make all the ingredients for an averaged size (725 gram) margherita pizza (Water Footprint Network, 2020)? Or that 2,400 litres of water are needed to make the beef, cheese and buns in a cheeseburger (EEA, 2019b)? If we take a deeper look at the environmental impact of a cheeseburger, the production of an average beef patty creates more carbon emissions than driving a large car for 15 kilometres (EEA, 2019b). The European Commission (2013) examined the carbon footprint of a restaurant meal and found that 87% of its emissions were offsite greenhouse gasses and can be reduced through green procurement. HoReCa businesses can reduce the impact that their chosen ingredients have on the environment by buying local, naturally produced and seasonal products, reducing air, land and water pollution in the process.

(European Commission, 2013)

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As previously discussed, sorting, recycling and reducing packaging are all actions that reduce pollution. The correct recycling of packaging materials like plastic or aluminium prevent these materials from being either sent to landfill, thus reducing land pollution, or from being incinerated which would reduce air pollution. In addition to this, by sending these materials to a recycling plant where they can be repurposed, there are estimated 50-70% reductions in energy and greenhouse gasses compared to producing these products from new/raw materials.

(European Commission, 2013)

The procurement of eco-friendly products doesn't only apply to food products. Earlier in this chapter, we also examined the concept of **moving to ecolabel chemical products**, or perhaps moving to homemade cleaning products. This action has a threefold impact on the environment – it **reduces air pollution in its production, it reduces land pollution in situations where leaks from chemical plants occur, and it reduces water pollution in the waste water which is a consequence of the cleaning process.**

(European Commission, 2013)

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Indirect Behaviours

Indirect behaviours are the actions that management does not have control over and cannot directly influence. These are usually activities related to a lack of information on behalf of local service providers, and the behaviours of third-party influencers, like customers and guests.

(European Commission, 2013)

On the one hand, we have seen the effectiveness of a properly implemented waste management policy on reducing pollution to land, air and water. On the other hand, however, there can also be indirect impacts on pollution from waste management. This mostly applies to the management of water and sewage waste. In Europe, we are very fortunate that clean water comes from the tap and dirty water is disposed of down the drain (EEA, 2019c). In most cases, wastewater treatment is carried out by local, regional or national authorities.

There is little or no influence to be made by business decision makers in the process. Nevertheless, i**t's important that businesses in the HoReCa sector understand where their waste is going and how it is being treated**. Water waste treatment centres in urban areas work to remove toxins and bacteria that are harmful to the environment before the water it is released back into nature (EEA, 2019c). However, there are cases where waste is being released straight back into the environment without being treated with harmful effects to natural ecosystems. For this reason, it is crucial that HoReCa business owners inform themselves on the local provisions for water waste treatment.

One of the most unpredictable indirect behaviours that affects pollution levels is that of customers or guests. It is not possible for managers or business owners to offset some actions taken by customers. For example, the mode of transport used to get a customer to and from a hotel or restaurant can have considerable effects on carbon emissions (European Commission, 2013). While this is not something that can be controlled, **there are some behaviours of guests you can hope to influence, such as: attitudes towards separating waste in bins provided; reusing towels and linens in rooms; bringing reusable containers or cups to cafés; switching off lights and appliances that are not being used**. Information is key to guiding the behaviours of guests. As mentioned in previous chapters, outlining zero waste policies to encourage customers can prove to be a very successful strategy, and in doing so lessen the carbon footprint of the organisation (European Commission, 2013).

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Other Forms of Pollution

Although air, water and land pollution have the most significant impact on the environment and wellbeing of the earth's population, there are other forms of pollution that must be taken into consideration when discussing the HoReCa industry, namely light and noise pollution.

Most frequently occurring in built up urban areas and cities, **light pollution is defined as excess light in the sky at night** (National Geographic, 2020). It can be hard to identify light pollution, as it very often depends on human perceptions. For example, one person's atmospheric lighting may be another person's irritation. **Five of the most common types of light pollution are: light trespass, clutter, sky glow, glare, and over-illumination (Hub Pages, 2020). Light pollution is one of the least talked about forms of pollution, but it's impact on the environment and human health must not be overlooked.** Looking firstly at the impact on health, excessive exposure to light at night-time can slow the body's production of melatonin. Melatonin is a hormone that helps keep your immune system fighting against any toxins in the body. Reduced levels of melatonin have been attributed to many forms of cancer (Hub Pages, 2020). Light pollution can also be harmful to the environment. Not only has it been connected to the increase of algae build up on lakes, but research also shows that increased light in the night sky can create confusion for nocturnal animals in differentiating between night and day (National Geographic, 2020). Furthermore, it is estimated that 4 to 5 million birds die as a result of collisions caused by light pollution every year (Hub Pages, 2020). Light pollution cannot be ignored and must factor into the pollution reduction practices of HoReCa businesses. One suggestion, from the European Commission (2013), is the installation of timer and sensor controlled outdoor lighting, angled in such a way as to provide minimal or no up lighting.

The final form of pollution that must be considered when discussing the HoReCa industry is noise pollution. Similar to light pollution, noise pollution is not often considered and occurs regularly in built up areas. **Noise pollution is defined as excessive noise in an area** (National Geographic, 2020). Although there are no specific health effects, noise pollution can irritate people in the locality. **On an environmental level, it can be detrimental to some animals, especially those depending on sounds waves and sonar** (National Geographic, 2020). Managers and owners of HoReCa businesses should be aware of any noise pollution their organisation is emitting. It is important that any outdoor activities or social events are mindful of local curfews and local inhabitants. Additionally, accommodation providers should consider the noise pollution from surrounding businesses, as this could factor in the comfort level of their guests. To combat this, sound proofing walls, ceilings, and windows will help to keep out noise in the area (European Commission, 2013).

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Unit 6.2- Pollution in HoReCa

Unit 6.2.2 -Reducing pollution in the HoReCa industry

Make the Change, Reduce Pollution

It is clear that there are a number of actions that could help businesses in HoReCa to reduce their pollution generation. Such a large array of potential actions can lead business owners or managers to wonder "where do I start?". To help with this, we have created a 'Reducing Pollution Checklist'. Combing all of the knowledge shared throughout this handbook, appendix 6.2 of this chapter provides a comprehensive checklist of measures that can be done by HoReCa organisations to reduce pollution. This checklist ranges from best practice changes actions, to green procurement or larger investments.

Unit 6.2.3 - Measuring your carbon footprint

Best practice strategies for businesses to manage their carbon emissions will of course vary depending on the business size, the good or service offered, and the location. There is one common recommendation present in all strategies, and that is the need for businesses to understand and measure their carbon footprint. **It is essential that business calculate their carbon footprint before taking any action;** this way they will be able to monitor and assess the success of the strategies they put in place (Carbon Trust, 2018). For some businesses, there is a requirement on a local or national level to calculate and report their carbon footprint, while other businesses like to do this as part of a wider strategy. So, how does a business in the HoReCa sector go about assessing their carbon footprint?

Calculating Carbon Emissions

In a study carried out about the best methods for carbon foot printing, Carbon Trust (2018) have determined that there are two methods used to calculate the carbon footprint of an organisation: measuring the carbon emissions for the organisation as a whole, or, measuring the carbon emissions of a specific product or service. Looking first at the activities collectively undertaken by a business, Carbon Trust (2018) outline six steps that should be taken to calculate an organisational carbon footprint - see figure 6.4. Carbon Trust (2018) have also outlined a step-by-step guide for measuring the carbon footprint of a specific product or service. This is a similar approach to that of the organisational calculation but is outlined in five steps. – see figure 6.5.

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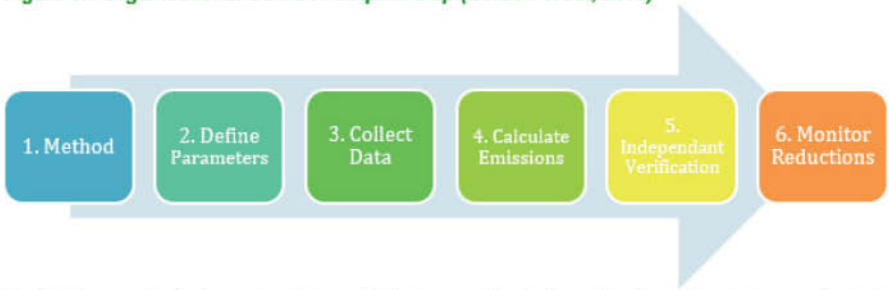
Unit 6.2- Pollution in HoReCa

Unit 6.2.3 -Measuring your carbon footprint

Figure 6.4 ***Organisational Carbon Footprint Map (Carbon Trust, 2018)***



1. **Method** – It is important to establish a method for collecting the data required for calculating carbon emissions, ensuring to use the same method in later calculations. This will safeguard more accurate calculations.

2. **Define Parameters** – Set clear instructions on which aspects of the business will be assessed. The bigger and more complex the organisation is, the more difficult this can be, but it is important that these parameters are set. Some examples of activities: fuel consumption, electricity consumption, supply chain goods and services, distribution of services or good to customers, and waste management.

3. **Collect Data** – Collect data from fuel (both for the premises and any transport receipts), electricity and water bills. These bills will give unit amounts of usage for each resource. Gather information about volumes of waste and try to obtain mileage information for products or services provided by suppliers. It is important to note areas where data is not available too.

4. **Calculate Emissions** - Carbon footprints are measure in tonnes of C02. To calculate this, you must use the data collected in the previous step and apply it to a standard emissions equation, called "emissions factors".

5. **Independent Verification** – Once this assessment of carbon emissions is completed, businesses may want to have their calculations verified by an independent company – especially in the case where these figures will be submitted to local or national agencies. This step however is optional.

6. **Monitor Reductions** – The final stage is to monitor the carbon emissions. Repeating steps 1-4 will allow businesses to assess the success of their carbon reduction strategies.

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Figure 6.5 ***Product/Service Carbon Footprint Map (Carbon Trust, 2018)***

1. **Map out the Processes** – Focusing on one specific product or service, map out or list all of the activities, processes, and materials/ingredients that are used to produce it.

2. **Define Parameters** – Decide on which aspects of the business will be assessed. Focus on emissions from direct actions rather than indirect actions, such as the emissions created by a customer/guest.

3. **Collect Data** – Collect consumption data from activities, processes and materials. Like the data from an organisational calculation, collect information on the consumption of fuel, electricity and water used to create the product or service. Again, seek to gather information about volumes of waste, and figures for transport mileage.

4. **Calculate Emissions** – Using the data collected, calculate the carbon emissions using the emissions factors equation (found online).

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Unit 6.2- Pollution in HoReCa

Unit 6.2.3 -Measuring your carbon footprint

Carbon foot printing is a complex process. It requires commitment, time and accuracy to be completed effectively. In addition to the two methods outlined above, there are a range of online tools available to calculate the carbon emissions of businesses. Some of the providers of these online tools, also offer paid carbon footprint assessment services. This may be useful for business managers/owners who may not feel confident in doing this process themselves, and/or may not have the time to commit to it. Figure 6.6 has some examples online tools than can assist HoReCa businesses with this.

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Figure 6.6 Examples of Online Calculators for Carbon Emissions

Carbon Footprint: https://www.carbonfootprint.com/small_business_calculator.html

Carbon Trust: https://www.carbontrust.com/resources/tools/carbon-footprint-calculator

Climate Care: https://climatecare.org/calculator/

Benefits of Carbon Foot printing

Carbon foot printing can provide many benefits for HoReCa businesses. Not only does it help management and staff to understand the carbon emissions inherent in the business processes, it also helps businesses to identify possible cost saving opportunities and to manage any potential long term risks the organisation may have.

(Carbon Trust, 2018)

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There are also reputational benefits for businesses. Customer's like to be informed about the carbon costs of their purchases or practices too. According to a Carbon Trust survey, 67% of consumers in Germany, France and the UK would like to see carbon footprint labelling on their products (Carbon Trust, 2018). The benefits of green marketing opportunities shouldn't be overlooked by HoReCa businesses. The commitment of an organisation to reduce carbon emissions can help differentiate them from other competitors in their sector. Thorough promotion of carbon emission strategies can also help to enhance the brand and overall perception of the business, potentially attracting new customers and guests to the establishment. For instance, 75% of consumers surveyed in France said they would take a more positive view of a company that had actively worked to reduce their carbon footprint.

(Carbon Trust, 2018)

Appendices

Appendix 6.1 – Chemical management checklist

Area	Service	Task
Efficient Practices	Cleaning	Turn off taps during cleaning
		Use microfiber cloths and mops
		Use a single flush of 3 litres on a dual flush toilet when cleaning
		Dilute concentrated cleaning products according to the manufacturer's instructions – it is important to note that dilution volumes may need to be adjusted based on the hardness of water
		Avoid the use of fragrances and air fresheners where possible
	Laundry	The dose of chemicals used should be measured to the volume and material make-up of laundry
		Pre-treat or "spot" stained materials with stronger chemicals like hydrogen peroxide
		Use detergents that work as lower temperatures
	Other Amenities	Maintain the appropriate temperature of a swimming pool through optimised management, thus reducing chemical consumption
		Convert existing outdoor swimming pool to a natural pool through the installation of natural plant-based filtration systems

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Completed		Notes
Yes	No	

Appendix 6.1 – Chemical management checklist

Area	Service	Task
Chemical Monitoring	List	Type and quantity of chemicals
		Quantity of chemicals purchased
		Ecolabel or not environmentally friendly
	Plan	Examine current levels of chemical left
		After one cleaning/laundry cycle, measure the volume remaining to establish the volume used at current levels
		Examine the expected chemical use, following the dosage set by manufacturers
		Set new targets for chemical use
		Clearly mark the correct dilution levels on cleaning equipment
		Install automatic chemical dosing units if needed
	Involve	Create chemical data sheets outlining the following: chemical type, use, suggested measurements, health and safety
		Appoint a leader to implement the organisation's chemical policy
Staff Training	Topics:	Chemical management
		Efficient Cleaning
		Health and Safety when using chemicals

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Completed		Notes

Appendix 6.2 – Pollution reduction checklist

Area	Service	Task	P
			Air
Energy	Change of Practice	Keep hot plates, grills, hobs, and gas burners clean	x
		Turn off (or lower temperatures) on grills, heat lamps, extraction fans etc when not in use	x
		Create a regular servicing and cleaning schedule for all appliances, including servicing thermostats and timers	x
		Install microwave ovens to cook or reheat smaller quantities of foods	x
		Avoid overfilling kettles and saucepans, and use lids to retain heat	x
		Only switch on equipment when necessary - discourage the practice of switching on equipment that is not needed	x
		Make a note of preheat times on appliances and display them somewhere clearly for kitchen staff	x
		Create a regular servicing schedule for dishwashers, and regular plumbing checks for taps and drains	x
		Maximise loads in dishwasher by stacking correctly, and avoid half loads being run	x
		Use economy setting on dishwashers where appliance	x
		Move refrigerators and freezers away from heat generating sources	x
		Create a defrosting schedule	x
		Create regular maintenance schedules for heating systems and radiators	x

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Appendices

Pollution Reduced			Completed		Notes
Water	Land	Light & Noise	Yes	No	
x					
x					
x					
x					
x					
x					

Appendix 6.2 – Pollution reduction checklist

Area	Service	Task	P
		Create regular maintenance schedules for air conditioning or cooling systems, and a clean rota for fans and filters	x
		Create a cleaning schedule for ventilation filters, ensuring grease traps in the kitchens are periodically cleaned	x
		Switch off all non-essential lighting out of hours	x
		Install timers and sensors for lights in low occupancy areas	x
		Keep lamps, bulbs, light fixtures clean and free from dust	x
	Investment	Invest in establishing renewable energy sources, like solar and wind power, on or off site of the business	x
		Install windows with triple glazing that will maximise protection of heat and cool air	x
Waste Management	**Change of Practice**	Separation of waste based on the material type: glass, metals, plastic, paper,	x
		Replace single use plastic condiments with refillable bottles	x
		Replaces plastic and paper cups with glasses and ceramics	x
		Replaces plastic water bottles with glass refillable ones	x
		Remove single use textiles like paper napkins and tablecloths and replace with reusable textiles	x
		Turn off taps during cleaning	
		Use microfiber cloths and mops	
		Use a single flush of 3 litres on a dual flush toilet when cleaning	
Chemical Use	**Change of Practice**	Dilute concentrated cleaning products according to the manufacturer's instructions – it is important to note that dilution volumes may need to be adjusted based on the hardness of water	

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Appendices

ollution Reduced			Completed		Notes
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		x			
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		x			
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	x				
	x				
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x					
x					
x					
x					

Appendix 6.2 – Pollution reduction checklist

Area	Service	Task	P
		Avoid the use of fragrances and air fresheners where possible	x
		The dose of chemicals used should be measured to the volume and material make-up of laundry	x
		Pre-treat or "spot" stained materials with stronger chemicals like hydrogen peroxide	x
		Use detergents that work as lower temperatures	
		Maintain the appropriate temperature of a swimming pool through optimised management, thus reducing chemical consumption	
		Convert existing outdoor swimming pool to a natural pool through the installation of natural plant-based filtration systems	
Supply Chain	Green Procurement	Choose ecolabel cleaning and hygiene products	x
		Choose sustainable ingredients for menus - sourced locally, grown organically, in season etc	x
		Select recyclable packaging materials	x
		Use green energy - source green electricity generated through renewable energy sources off site	x
Building		Ensure the building is fully sealed to prevent heat loss during winter, and cold air loss during summer	x
		Check insulation levels of the building and increase where possible to reduce heating requirements	x
		Install energy efficient lighting, indoors and outdoors, that has minimal up lighting	x
		Use non-toxic paints during internal decoration	x
		Install heat recovery systems to reuse heat generated through business practices, like cooking	x
		Ensure proper sound proofing of the building to prevent noise pollution	

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Appendices

ollution Reduced			Completed		Notes
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		x			
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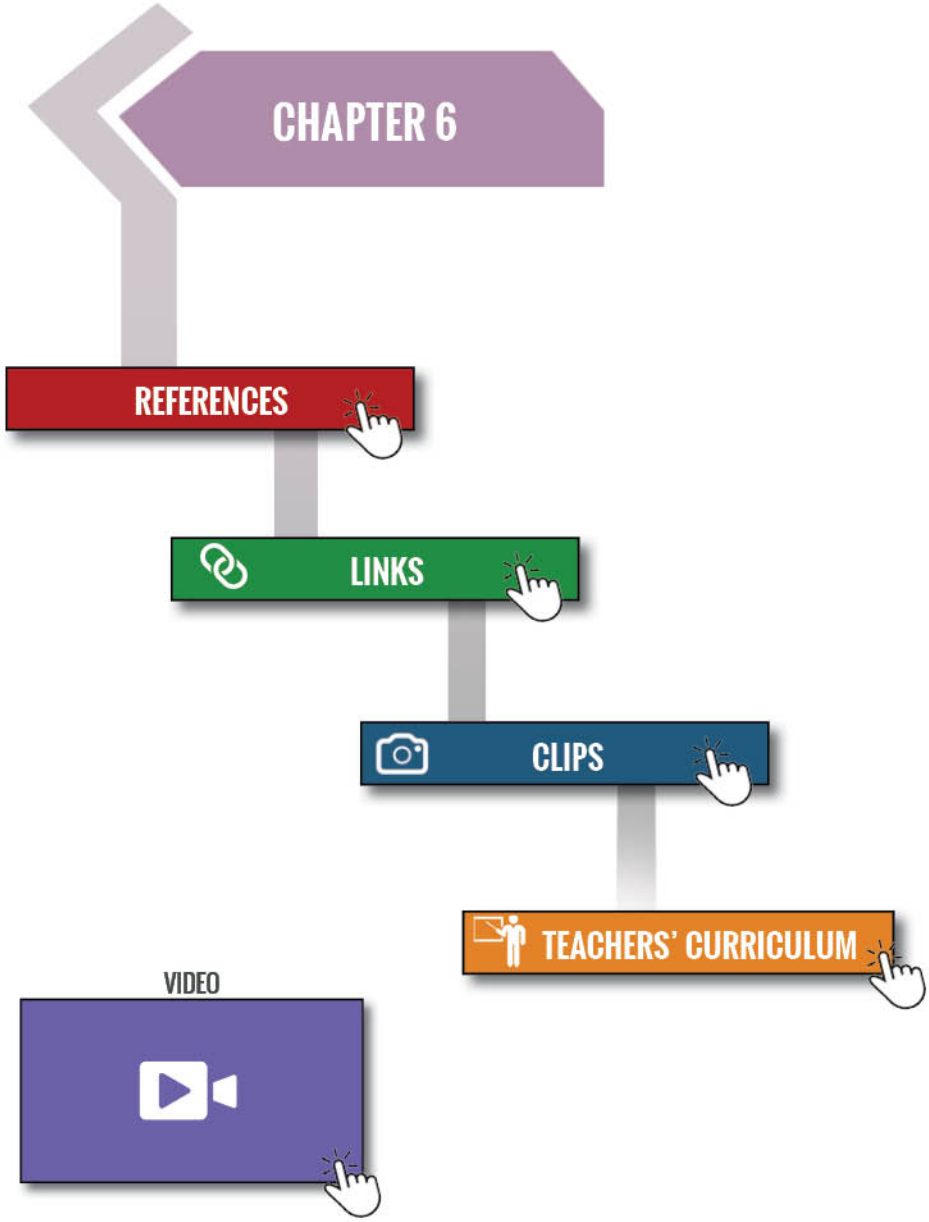

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