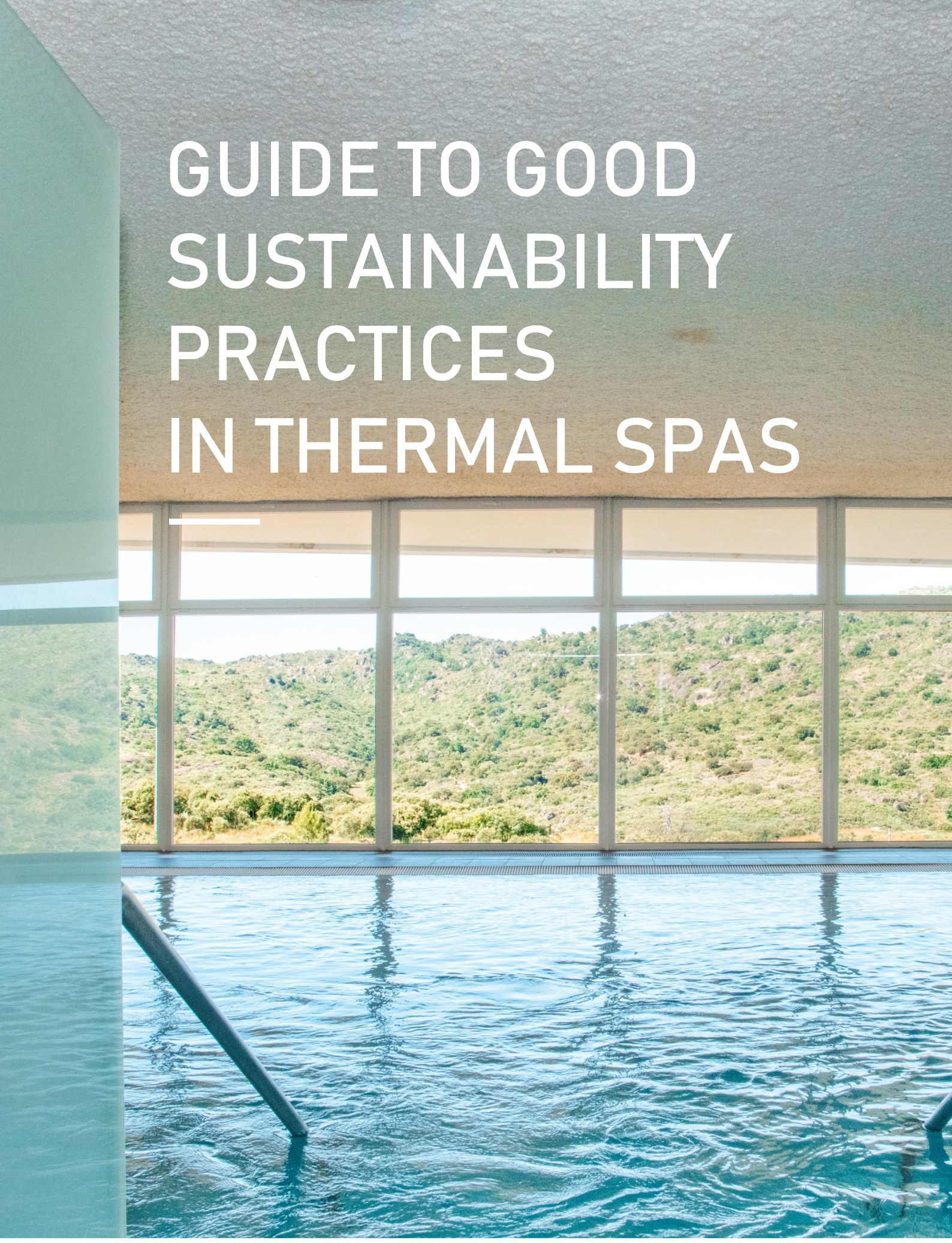
GUIDE TO GOOD SUSTAINABILITY PRACTICES IN THERMAL SPAS



TURISMO DE PORTUGAL

TERMAS DE PORTUGAL

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/ 0. INTRODUCTION

The vision defined in the 2027 Tourism Strategy ("ET27") aims to position Portugal as one of the most competitive and sustainable destinations in the world, making a strong commitment to the role that the tourism sector can and should play in achieving the Sustainable Development Goals set out by the United Nations.

In this context, ET27 is based on the affirmation of "Tourism as a hub for economic, social and environmental development throughout the territory, positioning Portugal as one of the most competitive and sustainable tourist destinations in the world" through eight strategic goals of economic, social and environmental sustainability:

1. Boost tourist demand in the country and in the various regions
2. Grow at a faster rate in revenue than in overnight stays
3. Make tourism a year-round business activity
4. Enhance the qualifications of people employed in tourism
5. Ensure that tourism makes a positive impact on resident populations
6. Improve energy efficiency levels in tourism companies
7. Foster rational management of water resources in tourism
8. Promote efficient waste management in national tourism activity

Therefore, bearing in mind the urgent challenges of sustainability, Turismo de Portugal brought together a set of 119 initiatives and projects in the +Sustainable Tourism Plan 20-23 with a view to reinforcing the sustainable performance of the sector. The aim is to contribute to stimulating the circular economy in tourism and fostering the transition to an economic model based on prevention, reduction, reuse, recovery and recycling of materials, water and energy, thereby reinforcing the Agenda for the Circular Economy in the Tourism Sector. This would place the tourism ecosystem at the forefront of the climate transition, for a new green and inclusive economy. The +Sustainable Tourism Plan 20-23 aims to reinforce the sustainable performance of the sector, particularly in the context of the circular economy and climate change.

The Termas de Portugal Association and Turismo de Portugal have worked in close partnership to draw up this guide. As one of the actions foreseen in the +Sustainable Tourism Plan 20-23, it aims to set out good practices and management methodologies that will make it possible to improve environmental, economic and social sustainability practices associated with the operation of thermal spas. As such, the aim is to raise awareness among entities responsible for managing thermal spa establishments as to the effective contribution they can make to the sustainable development of Portugal as a tourist destination, challenging them to continually improve their performance.

Notwithstanding compliance with any applicable legislation, the recommendations set out in this guide are voluntary in nature and are based on encouraging the implementation of the Sustainable Development Goals.

/ CHAPTER ONE
THE ENVIRONMENT

/ 1. INTRODUCTION - GENERAL PRINCIPLES OF ANALYSIS AND ASSESSMENT OF ENVIRONMENTAL ASPECTS

The following associated activities are taken into account when analysing environmental aspects:

a. Atmospheric emissions;

b. Discharges into water environments;

c. Discharges into soils;

d. Use of raw materials and natural resources;

e. Energy use;

f. Emitted energy, e.g. heat, radiation and vibrations;

g. Waste and by-products;

h. Physical characteristics.

/ 1.1 CHARACTERISTICS OF THE TEAM RESPONSIBLE FOR THE ENVIRONMENTAL SURVEY

The team responsible for the environmental survey and monitoring must have the following characteristics:

_Be familiar with the activity being assessed;

_Be familiar with the technologies used;

_Be familiar with the environmental legislation applicable to the activity within the scope of its practical application.

/ 1.2 CLASSIFICATION OF ENVIRONMENTAL IMPACTS

Impacts are classified individually according to a table drawn up by the organisation.

Regardless of their level of significance, impacts must be checked against a legal compliance filter to ensure that all associated legal requirements are met. If they are not, the impacts in question will then be treated in the same way as impacts that are classified as significant. Goals and actions are drawn up to address significant aspects and ensure that the goals can be achieved within the defined period of time.[1]

[1] Impacts are classified individually according to a scale to be drawn up by the organisation.

/ 2. NATURAL MINERAL WATER

/ 2.1 INTRODUCTION

Natural Mineral Water (NMW) is the foundation upon which the entire thermal spa establishment is based.

In Portugal, this resource belongs to the State and as such public or private entities are contracted as operators. These partners assume responsibility for ensuring the safeguarding of this asset by using it in the most complete way possible, respecting the extraction format approved by the government authorities in charge (flow rates and hydrodynamic levels, when applicable), guaranteeing renewability and maintaining its quality from origin to point of use.

Natural Mineral Water is created by Nature, without human intervention. Its composition reflects the entire journey it has taken from the time it fell as a drop of rain until it is made available for use.

Natural mineral waters represent just a tiny percentage of all the water on Planet Earth, and those used in thermal spa establishments are even rarer because they have therapeutic properties.

/ 2.2 MEASURING AND OPTIMISING THE CONSUMPTION OF NATURAL MINERAL WATER

2.2.1 WHY IT IS IMPORTANT / GOALS

Natural mineral water must be used sustainably, avoiding waste.

Every activity involving natural mineral water (extraction, adduction, storage, preparation, distribution, application, etc.) needs to be monitored to ensure that ideal conditions are in place for its use, thereby minimising losses.

2.2.2 GOOD PRACTICES

The reporting organisation must:

_Identify possible ways to optimise NMW consumption that could lead to a reduction in use without compromising the quality of the resource or changing the minimum need for practice and/or procedure.

_Establish quantified goals by practice and/or procedure;

_Describe how the organisation interacts with NMW, including how and where it is captured, consumed and discarded, and how its use is directly related to the organisation's activities, products or services;

_Detail the monitoring and control format that ensures compliance with the Operating Plan approved by the government authorities in charge.

CAPTURE OF NATURAL MINERAL WATER

The reporting organisation must provide the following information:

a. The total amount of NMW captured in all areas in cubic metres per year, breaking down this total as follows, if applicable:

i. NMW captured;

ii. NMW provided by third parties.

b. Any contextual information necessary to understand how the data was compiled, such as standards, methodologies used and assumptions made.

PROTECTION OF NATURAL MINERAL WATER

The reporting organisation must clarify:

a. How the integrity of the Concession Protection Perimeter is monitored.

b. What procedures are in place to ensure compliance with the measures imposed by the Concession Protection Perimeter.

CONSUMPTION OF NATURAL MINERAL WATER (NMW)

The reporting organisation must report:

a. Total NMW consumption of all areas in cubic metres per year.

b. Total NMW consumption in cubic metres per facility operating as a thermal spa.

c. Total NMW consumption in cubic metres per year per preparation process (heating, cooling, cleaning of the facilities, etc.)

d. Any contextual information necessary to understand how the data was compiled, such as standards, methodologies used and assumptions made, including whether the information was calculated, estimated, modelled or derived from direct measurements, as well as the approach adopted for this purpose, such as the use of sector-specific factors.

/ 3. WATER FOR HUMAN CONSUMPTION

/ 3.1 INTRODUCTION

Water is essential to life: it guarantees the existence of human beings, biodiversity and the balance of ecosystems. In addition to ensuring subsistence, water plays an essential role in the population's quality of life as it is essential for economic activities, including services (hospitality and civil construction, for example) and products (paper, clothing and others). To ensure the quality and quantity of water available for the current and future generations, we must plan and manage its uses and monitor its condition.

In Portugal, the principles governing the management of water resources - surface and groundwater - are as follows: everyone has access to water; water is protected as an environmental asset; and, as a scarce resource, water must be used efficiently. Water plans and programmes aim to use this resource sustainably, in order to meet the current and future needs of the population.

Pollution, overexploitation, destruction of aquatic habitats and the effects of climate change, with increasingly frequent droughts and more severe flooding, continue to compromise the quality and availability of water. In turn, this forces ordinary citizens and economic agents in all sectors to be more aware of the need for this natural resource to be consumed rationally. Not doing so could jeopardise the future of forthcoming generations.

The 2027 Tourism Strategy (ET2027) is the strategic benchmark for tourism in Portugal over the next decade. ET2027 aims to provide a 10-year strategic reference framework for national tourism, ensure stability and the assumption of commitments regarding strategic options for national tourism, and promote the integration of sectoral policies.

This strategy commits to economic, social and environmental sustainability goals.

With regard to water, it sets the goal of promoting the rational management of water use in tourism with the aim of ensuring that more than 90% of tourism companies adopt measures to use water efficiently.

Furthermore, the +Sustainable Tourism Plan 20-23, launched by Turismo de Portugal for the sector, aims to "position Portugal as one of the most competitive, safe and sustainable tourist destinations in the world through economic, social and environmental development throughout the territory". One of its goals is for "75% of tourist resorts to have energy efficiency, water and waste management systems". The AQUA+ Hotels initiative, promoted by ADENE - Energy Agency, is mentioned in the plan as a "national benchmark for water efficiency". In order to achieve the goals set, it is deemed fundamental that the sector implements and adheres to it in all tourist regions.

Additionally, managing water more efficiently by cutting down its use contributes decisively to the reduction of energy consumption, within the water-energy nexus, and is therefore also a fundamental measure of energy efficiency, targeted in the Energy Savings Plan (PPE 22-23) and in the National Energy and Climate Plan (PNEC 2030).

At the same time, from the point of view of energy production, water is a critical factor, and can even be limiting at times when it is scarce. It is also a limiting factor for the country's energy independence and the decarbonisation of the energy sector, as renewable energy largely depends on the availability of water resources (e.g. hydroelectric production, solar energy, green hydrogen).

On the other hand, the efficiency and decarbonisation of the energy sector can reduce its water needs by almost 40% (also closely associated with energy production from conventional sources), so energy efficiency and renewable energy are fundamental tools for conserving water resources.

Within the scope of the Sustainable Development Goals (SDGs), efficient water use is encouraged in all sectors of activity, boosting water availability and sustainable water management (SDG 6). Savings in the use of domestic hot water are also encouraged, which contributes to significant energy savings through the water-energy nexus, promoting energy efficiency (SDG 7).

/ 3.2 MEASURING AND OPTIMISING THE CONSUMPTION OF WATER FOR HUMAN CONSUMPTION

3.2.1 WHY IT IS IMPORTANT / GOALS

Small gestures can lead to the use, or reuse, of water for other purposes. As an asset that is in short supply, water needs to be given its due value and its rational use encouraged.

In buildings, special attention must be paid to behaviours, keeping water usage times as low as possible and making use of efficient appliances. When choosing products, consider those that are certified and labelled as being more water-efficient. Look for the Unified Water Label (common European label) and the national ANQIP certification (which is part of the common European label). These instruments, available for appliances such as taps, showers and flush toilets, indicate an appliance's water efficiency, making it easier to identify those that perform better. Identifying water losses in networks or equipment (e.g. taps, showers and toilet cisterns) is an important step towards reducing waste. In addition to these measures, it also makes sense to assess and improve the overall efficiency of buildings, considering the reuse or recycling of water (grey water, for example) and the use of alternative sources (such as rainwater) for non-potable purposes. These actions must be promoted as contributions to boosting water resilience. User safety must be ensured when collecting and storing such waters, for example, through technical specifications framed in national or European regulations and the necessary equipment must be installed by professionals with appropriate technical competence.

Building systems fed by the public network must be independent of any water distribution system from another source, just as the drainage network of new or rehabilitated buildings must allow the separation of grey water and rainwater to facilitate their use in the future.

One of the ways to reduce water consumption is through the correct choice of products, appliances and devices for using water in buildings, thus ensuring greater efficiency and equal or greater comfort. On the other hand, we must also be mindful of the time spent with the water running, so as not to negate the potential benefits of reducing instantaneous flow rates that can be achieved by renewing and replacing devices.

In addition to the renewal and replacement of appliances, devices and equipment, there are domestic hot water circulation and return systems that allow us to use water in greater comfort while also being a measure of water efficiency. However, systems such as these must be appropriately sized, without losing sight of the energy efficiency factor, thus ensuring the best balance between energy and water performance associated with the domestic hot water circulation and return system. Some water may also be lost due to deficiencies and/or ruptures in a building's network, which would need to be repaired. However, it is essential to pinpoint any such deficiencies and/or ruptures in order to cut down

on needless consumption in buildings. Smart water consumption monitoring and management systems help to identify these situations.

There are water-saving systems for buildings that consist of reusing and recycling black and grey water. Among these, the use of grey water as an alternative internal source may be the most viable, since it should require less treatment in order to be used for the same purposes. It should be noted that these technology-based solutions must be analysed on a case-by-case basis, and the safety of water during reuse must always be ensured. There are also systems for using rainwater, which can result in important savings in buildings, particularly those with gardens and outdoor areas, in addition to flushing toilets, washing machines and other uses (e.g. cooling towers). Again, these must all be properly dimensioned and adapted on a case-by-case basis. Furthermore, it may be possible, in some cases, to consider the use of reclaimed water from WWTPs for non-potable purposes.

As in the case of grey water reuse, these facilities must be certified in order to ensure that they comply with any standards or regulations applicable in Portugal or Europe in terms of technical quality and public health. These recovery systems must be equipped with an alternative water supply system so that they can operate during periods when there is no rain, thus ensuring that water can still be supplied without interrupting the supply from the non-potable network. In these cases, it is advisable to install systems that automatically and safely manage and switch supply sources. The networks installed must be separate from each other to prevent water from alternative sources entering the network that supplies water for human consumption.

In thermal spas, water from the public network is typically consumed in the bathrooms, changing rooms and laundry rooms (if available).

3.2.2 GOOD PRACTICES

Better water efficiency in buildings is increasingly within everyone's reach, benefiting from ongoing technological developments and the continuous development of innovative products and solutions. There are several areas in buildings where there is the potential to reduce waste (losses) and water consumption.

Diagnosing the current situation helps to identify and subsequently implement direct water-saving measures in the most appropriate locations. Indirect measures, in terms of behaviour, can also be pinpointed, helping to improve usage efficiency from the outset without the need for interventions in the building. Measures geared towards water efficiency are a priority and include awareness-raising strategies/campaigns and dissemination of good practices for reducing water consumption aimed at customers, employees and/or the local community, creation of good practice handbooks or regular training on water efficiency issues in thermal spa establishments.

Saving water also means saving energy since the collection, transport and treatment of water supplies (and wastewater) are operations that require high energy consumption and costs. More efficient energy and water use can help keep both of these down.

In the water-energy nexus approach, water and energy resources are addressed in an integrated manner, taking into account the interdependencies and mutual impacts between them. Solutions that simultaneously optimise the use of these two resources should be prioritised, taking advantage of the combined potential of both water and energy, which is greater than that obtained from isolated approaches.

GENERAL ASPECTS

The reporting organisation must provide:

a) A description explaining how the organisation interacts with water, including how and where it is captured/received, consumed and discarded, and how its use is directly related to the organisation's activities, products or services;

b) Details about the monitoring and control format.

WATER RECEIVED / WATER CAPTURED

The reporting organisation must provide the following information:

a. The total amount of water received/captured in all areas in cubic metres per year, breaking down this total as follows, if applicable:

i. captured water;

ii. water supplied by third parties;

b. Any contextual information necessary to understand how the data was compiled, such as standards, methodologies used and assumptions made.

WATER CONSUMPTION

The reporting organisation must report:

a. Total water consumption of all areas in cubic metres per year.

b. Total water consumption in cubic metres for each type of operating facility;

c. Any contextual information necessary to understand how the data was compiled, such as standards, methodologies used and assumptions made, including whether the information was calculated, estimated, modelled or derived from direct measurements, as well as the approach adopted for this purpose, such as the use of sector-specific factors.

GOALS FOR REDUCING WATER WASTE

The reporting organisation must:

a. Identify possible ways to optimise water consumption that could lead to a reduction in use without compromising its quality and minimum need for use, promoting regular water efficiency audits;

b. Set quantified goals by practice and/or procedure.

MEASURES TO AVOID THE MOST COMMON OCCURRENCES OF DAY-TO-DAY WATER WASTE

Use maximum loads (defined by weight) when using washing machines (avoid partial loads); avoid excessive use of detergents, as the appropriate use of detergent prevents increased water consumption; whenever possible, do not use the pre-wash function.

Install thermostatic taps (with stable temperature) or "eco-stop" (with timer to cut flow); low-flow showers and taps (or fitting reducing devices in high-flow showers or taps) may be unsuitable in some cases, as reduced flows may be insufficient to activate instantaneous hot water appliances. This situation must be checked in advance, using the relationship between flow and pressure recommended for these appliances. Alternatively, install flow reducers or slightly close the water flow inlet valve. The installation of flow reducers limits the flow delivered by the appliance, in some cases causing air to be mixed into the water jet, thus maintaining the user's comfort level. Complementary criterion of the Ecological Public Procurement Handbook for Sanitary Systems: maximum flow of 7 litres/minute in showers and 4 litres/minute in washbasin taps (measure aligned with the European Taxonomy, which establishes a maximum flow of 8L/min for showers and 6L/min for washbasin taps).

To avoid wasting the water that runs between the time a tap is turned on and hot water coming through, systems or equipment can be installed for the circulation and return of hot water or water heat recovery. Generally, the installation of such systems is recommended, when possible, for hot water networks where it is justified by the distance between the appliance that produces the hot water and the farthest point of consumption. When applied to networks, these systems require some type of water storage and must therefore be compatible with the domestic hot water production system. With such systems, adequate sizing becomes even more important in order to obtain the best performance from the point of view of the water-energy nexus;

Install toilet cisterns with a double flush mechanism. In flush toilet systems (representing one of the highest water consumptions in the building cycle), there are more efficient mechanisms and others that support an adjustment of the flush volume, for example in relation to use (double flush or interrupted flush, where the user has the option to stop the flush). Other alternatives offer the possibility of using a smaller volume than the original for the same compartment (through replacement with more efficient mechanisms), without the need to replace the existing cistern. Whatever the circumstances, the drainage system must not be compromised, in order to avoid blockages. The maximum flush volume must be six litres per flush, and the average flush volume 3.5 litres, in accordance with the European Taxonomy criteria.

Regularly monitor water consumption in the establishment, aiming to detect any leaks due to breaks in the networks or leaks in appliances, so that remedial action can be taken quickly. Ideally, sensors that can detect leaks, raise the alarm and take automatic control should be used, but monitoring can also be carried out by using partial meters (e.g., for irrigation, swimming pools or treatment rooms) or through the analysis of water bills;

Keep pipes in good condition and implement preventative monitoring routines that allow leaks to be detected early and repaired immediately;

Keep appliances and equipment well maintained and calibrated, following manufacturers' instructions and carrying out regular maintenance services;

Reuse rainwater, e.g. for irrigation: rainwater collection and water reuse systems are other sources of water that can be used for watering purposes and for washing outdoor spaces. The ideal approach is to install an efficient irrigation network in all gardens and similar areas (for example: drip systems) and, if the area to be irrigated is large, use sprinklers, as they are more efficient and can be adapted to any terrain configuration. The quality of the water to be applied with localised irrigation (litres/plant/day) must be adequate to requirements, mitigating problems of surface runoff and waste. Moisture sensors can also be installed in the soil to interrupt the watering system when it rains, allowing the intensity to be regulated. This can help avoid unnecessary water consumption due to surface runoff onto pavements or into drains.

For green spaces and gardens, choose plant species adapted to the region's climate so that frequent watering is not necessary. Opt for biodiverse or rainfed meadows in preference to grassy areas, which have comparatively greater water needs;

If possible, use geothermal energy to heat rooms and water for use in showers, bathrooms and kitchens, as well as for use in greenhouses, aquaculture (hydroponic crops, fungiculture) or fish farming.

Whenever possible, choose passive systems (gravity) and/or systems powered by renewable energy for the distribution of water from alternative sources to the points of consumption;

Where swimming pools are concerned, greater water efficiency can be achieved by making them shallower and keeping up proper maintenance. Ensure the pool is watertight to reduce leaks and water loss due to overflow and evaporation (e.g. fitting a pool cover can reduce the amount of water lost through evaporation and save energy). Properly maintaining the quality of the pool water through more efficient processes and recirculation can also avoid the use of unnecessary water. The pool must be cleaned to minimise clogging of the treatment filters and, consequently, the frequency with which washing is required. The water used to clean the filters can be repurposed, for example for irrigation, as long as its quality is suitable for the intended purposes.

For swimming pools, prioritise:

_biological water renewal systems (these promote the natural renewal of water, reducing the need for the use of chemical products), smart treatment systems or automatic treatment systems complemented with ultraviolet or ozone. A balanced treatment system increases the effectiveness of water treatment and reduces the need to use mains water to ensure the cleanliness of the water in the pool;

_filtration systems consisting of OC-1, glass or sand and anthracite. A well-designed filtration system increases the effectiveness of water treatment and reduces the need to use mains water to ensure the cleanliness of the water in the pool;

_Implementation of variable speed pumps that improve energy and water efficiency and reduce the likelihood of leaks.

Raise customers' awareness about:

_Taking quick showers and always turning off the tap while soaping up (also applicable to handwashing if the facility does not have timed taps);

_Changing towels less often, when possible;

_Not putting rubbish into the toilets, sinks or showers, so as not to block the drains (e.g. with hair);

_Using the toilet with half flush when possible (and when available);

_Reporting any leak detected to an employee.

Raise awareness/train employees by:

_Drawing up a handbook of good practices;

_Providing annual training on water efficiency topics for employees;

_Disclosing water efficiency indicators;

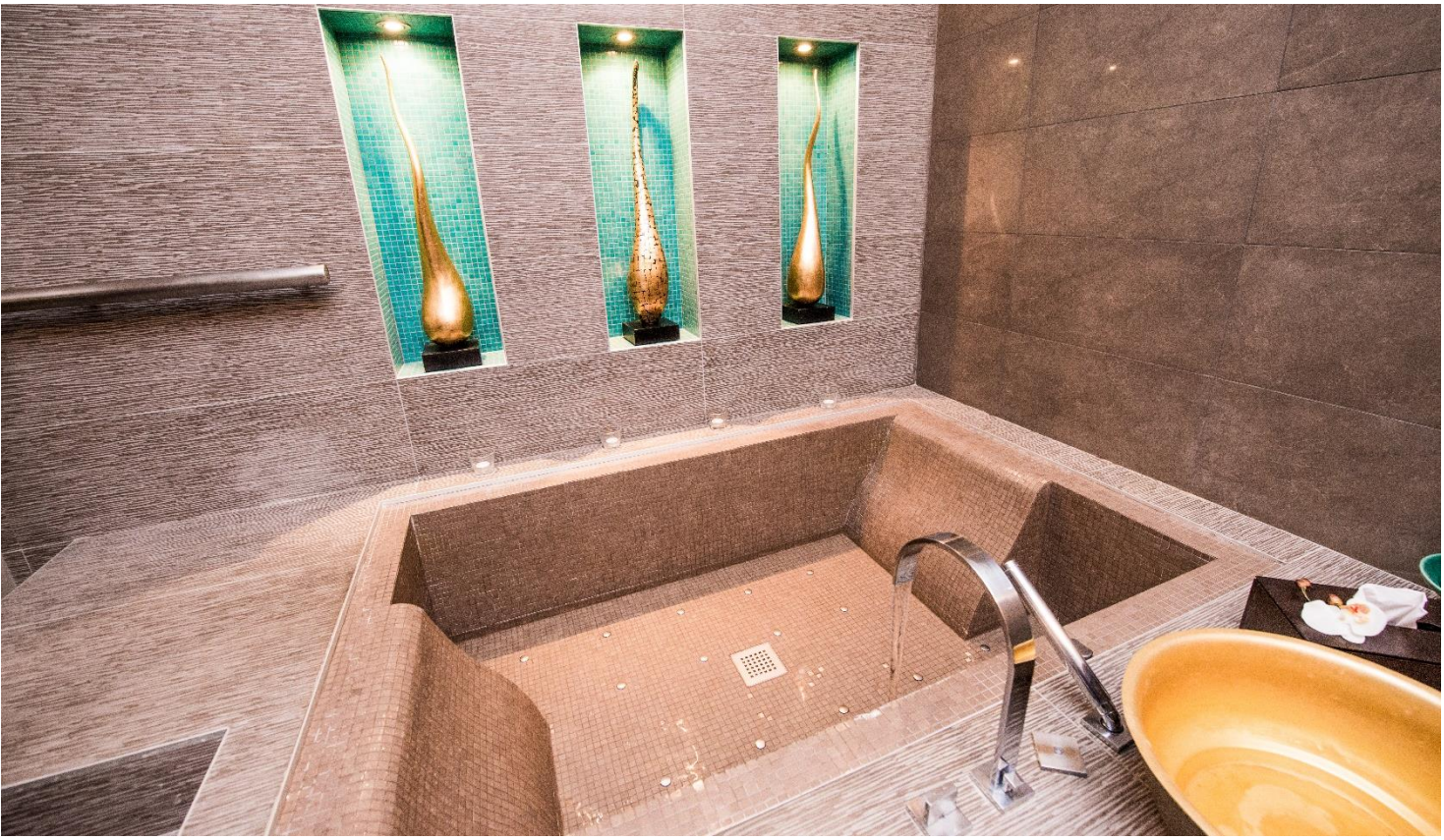
_Measuring the results of awareness-raising campaigns;

_Ensuring employees know they should report any leak detected.

Carry out regular audits, using, whenever applicable, the national water efficiency classification benchmark AQUA+, to identify improvement measures that allow for the continuous reduction of water consumption as well as energy associated with water use.

/ 4. ENERGY EFFICIENCY

/ 4.1 INTRODUCTION



Energy efficiency is a means to improve the use of energy sources. The rational use of energy, sometimes simply called energy efficiency, consists of using energy efficiently to obtain a certain result. By definition, energy efficiency means getting the best results in any given activity while utilising the least amount of energy resources possible.

Energy efficiency is often associated with the term "Rational Use of Energy" (RUE), which presupposes the adoption of measures that allow for better use of energy, not only in people's homes but also in the service sector and industry.

By choosing, purchasing and using equipment and appliances appropriately, it is possible to achieve significant energy savings, maintain comfort and boost the productivity of energy-dependent activities, thus obtaining economic and environmental benefits.

Consuming energy more efficiently brings a number of benefits, the most significant of which are:

_Savings on electricity bills;

_A reduction in the use of non-renewable energy sources, such as oil and natural gas;

_A reduction in the emission of greenhouse gases, released during the combustion of certain energy sources.

In the legal framework that supports the implementation of the goals of the Paris Agreement, the EU has chosen energy efficiency as a priority. Aligned with the strategic vision of the European Union, the National Energy and Climate Plan 2021-2030 (PNEC 2030) has made energy efficiency a priority for Portugal, having set a goal of reducing energy consumption by 35%, compared to the projections of the 2007 European Union Reference Scenario.

Energy efficiency covers a very broad range of actions. A special focus has been placed on the energy efficiency of buildings, given that buildings are responsible for 40% of energy consumption throughout Europe, acting in terms of buildings' thermal enclosure and the adoption of efficient heating and/or cooling systems. Other important measures for achieving energy efficiency include the promotion of intelligence and digitalisation in energy consumption, the promotion of efficient equipment and the dissemination of information to consumers, helping them to consume energy more efficiently.

In buildings, energy efficiency is often associated with air conditioning systems, water heating (within the water-energy nexus) and electric lighting. Traditionally, these systems work using fossil fuels; in addition to not being sustainable or environmentally friendly, their use translates into high and ongoing costs for the user. In recent years, the use of renewable energies — such as geothermal energy, biomass, tidal and wave movement, wind, sun and water — has been promoted as an alternative.

Rehabilitating buildings and making them more energy efficient increases the likelihood of achieving multiple goals: enhancing comfort levels for users in terms of ambient temperatures, improving indoor air quality, health benefits, promoting workers' productivity, extending the useful life of buildings, increasing their resilience, and reducing the country's energy bill and dependence, as well as reducing greenhouse gas (GHG) emissions.

Based on the continuous improvement of energy consumption, the intention is to demonstrate that energy management allows organisations to achieve levels of energy efficiency that will enable them to cut costs associated with the use of energy in their activities. It is estimated that energy efficiency measures could cut consumption in buildings by more than 50%.

ENERGY MANAGEMENT

Energy management is the way forward to add value, by reducing costs and inefficient energy use: managing energy is optimising. The energy management process usually begins by carrying out a diagnosis or an energy audit. This involves making a detailed survey of all aspects which are either related to the use of energy or contribute in some way to the characterisation of energy flows. This is done in order to identify and characterise the energy of the different equipment and systems existing in a facility, establishing correlations between energy consumption and the use of the building, and allowing the calculation of the corresponding specific energy consumption and energy efficiency indicators. It also allows the identification of technically and economically viable measures that can be implemented in order to boost energy efficiency and/or reduce energy bills.

For some entities, energy costs, whether electricity or fuel or in the form of thermal energy, have a significant weight in their cost structure, whether in buildings or vehicle fleets, so the process of contracting energy supplies with suppliers can often afford an opportunity worth

considering when it comes to optimising energy costs.

The decentralised production of electrical energy from renewable resources provides a possible opportunity for reducing energy costs, and applies to production intended for self-consumption (UPAC - predominantly intended for the consumption of electrical energy produced in the installation associated with the production unit, with the possibility of selling any excess at market price) and/or selling to the public grid (UPP - allows the producer to inject all the electrical energy produced into the public grid, being remunerated by a tariff assigned on the basis of a bidding model).

Thanks to the monitoring and control of equipment or systems, the installation of centralised energy management solutions allows energy consumption to be reduced, increasing the comfort and safety of buildings (for example, in public places or those accessible to many users, it is more hygienic not to have a switch and this also ensures that lights are not left on unnecessarily).

GEOTHERMAL ENERGY

A sustainable society implies the use of energy systems in a sustainable way from an economic, social and environmental point of view, as well as these practices being compatible with the well-being of future generations. The growing focus on renewable energy, with the consequent replacement of fossil fuels, has led to the use of various alternative energy sources, so we can expect to see growing demand for the use of geothermal energy. This promising technological solution brings benefits (local and regional), not only for its energy and economic viability, but also for its social and environmental performance.

Environmental aspects

When compared to other energy sources, geothermal energy has fewer negative environmental impacts and is safer, allowing the natural environment to be maintained, as well as the integrity of communities and other underlying ecosystems, simultaneously enabling economic and social development. The high availability and potential uses of geothermal energy, combined with the fact that it is a low-carbon technology, could greatly contribute to combating climate change.

Social aspects

New investments in the exploitation of geothermal energy could boost economic activities associated with social development, as well as having direct and indirect positive impacts on employment opportunities (with different degrees of specialisation) and, consequently, on the local economy.

RECOMMENDATIONS

We need to more actively promote the use of surface geothermal energy so that this renewable energy source can be used for air conditioning in buildings and the production of sanitary hot water.

In terms of energy efficiency in buildings, the use of geothermal energy is beneficial since it is estimated that around 40% of European energy consumption occurs in this area. As such, geothermal energy will help achieve European targets in terms of energy efficiency.

Furthermore, geothermal resources make a noteworthy contribution to reducing greenhouse gas emissions and, consequently, to mitigating climate change.

/ 4.2 AIR CONDITIONING - MEASURING AND OPTIMISING ENERGY CONSUMPTION

4.2.1 WHY IT IS IMPORTANT / GOALS

It is a fact that air conditioning systems are the first resource for thermal comfort. However, if the quality of materials in terms of thermal insulation (with thermal insulation in the surroundings, good sun exposure and efficient construction systems) are not taken into account in a building's design and construction, this comfort will be compromised, and this will be especially true of energy efficiency. When it comes to thermal comfort, other aspects also come into play, since, even when using clean sources, efficiency is closely related to the consumption rate and not just the generating source.

In the vast majority of cases, the thermal comfort of buildings, and the inherent control of indoor environmental conditions, depends on the use of technical air conditioning systems (heating, cooling and ventilation) and is fundamentally based on three aspects:

_Thermal comfort index (type of building, type of activity and type of users);

_Quality of the surroundings (construction solutions and type of materials);

_Effectiveness of the technical systems (air conditioning and/or ventilation).

4.2.2 GOOD PRACTICES

Here are some measures that can be used to promote energy efficiency in air conditioning in buildings:

_Replacement of glazed openings (windows and doors) with more efficient ones (e.g. replacement of single glazed windows with more efficient ones and installation of external sun protection, among others) as well as application of thermal insulators on walls, roofs and floors;

_Interventions to incorporate bioclimatic architectural solutions, which involve the installation or adaptation of fixed elements of buildings, such as shading, greenhouses and green roofs or facades, prioritising natural-based solutions;

_Installation of systems that promote natural ventilation of indoor air and/or natural lighting;

_When there is forced ventilation in the building, the air distribution circuits must be equipped with good quality filters, which must be cleaned regularly in order to reduce resistance to the passage of air and ensure good indoor air quality;

_If it is possible to regulate the temperature of spaces, temperatures above 20°C in winter and below 25°C in summer should be avoided. For each degree of difference, energy consumption increases by around 7%;

_Shades, shutters and blinds on windows must be closed when the space is to be kept cool and open when the space is to be heated;

_Keep doors and windows (interior and exterior) closed in order to keep the space heated or cooled

by the air conditioning systems. This will reduce the amount of energy that the systems need to use in order to raise or lower the temperature;

_Let outside air into the building at night to help lower the temperature inside (free cooling);

_If possible, do not have air-conditioning running in unoccupied areas of buildings;

_While still ensuring adequate conditions of comfort, avoid keeping HVAC systems operating continuously, particularly during peak hours, when energy is more expensive, and at night. Additionally, associated pumping systems must be deactivated when HVAC systems are deactivated.

_Use of inverter air conditioning equipment systems. These systems adjust the compressor speed, avoiding frequent starts and stops. This means the desired temperature can be maintained with fewer variations, as well as being quieter;

_Implement appropriate maintenance routines on air conditioning equipment in order to optimise their performance.

Image 11 – Carvalhal Thermal Spa

_Optimisation of fluorinated gases in existing air conditioning and/or DHW (domestic hot water) systems, or their replacement with natural-based or alternative refrigerants;

/ 4.3 WATER HEATING - MEASURING AND OPTIMISING ENERGY CONSUMPTION

4.3.1 WHY IT IS IMPORTANT / GOALS

Water heating systems provide hot water at a user-defined temperature. There are many different types of water-heating equipment, which use a variety of energy sources and respond to all sorts of needs. In many cases air conditioning systems include hot water production and storage equipment. Daily hot water consumption profiles are decisive for selecting the most appropriate technology. There are different technologies that allow you to heat water efficiently, with several primary energy sources that can be used: gas, biomass, solar thermal or heat pumps. The choice depends on the type of energy you want to use or that is available, the type of building and the hot water requirements.

A temperature range of 30°C to 40°C is enough to feel comfortable when using domestic hot water (DHW) for personal hygiene. However, the temperature must be adjusted to obtain a minimum temperature of 50°C at any point in the heating and distribution network, in order to prevent the development of bacteria such as Legionella. It can generally be considered that the temperature required for most DHW uses is between 50°C and 60°C.

4.3.2 GOOD PRACTICES

Here are some measures to promote energy efficiency in water heating:

_Installation of space heating and/or cooling and/or hot water systems, which use renewable energy, for the production of hot water, for example high efficiency heat pumps that use gases with a reduced global warming factor (R290 and R744), solar thermal systems, geothermal energy, etc.;

_Installation of heat exchangers to take advantage of water returning from the network, at points of hot water use, or equivalent systems;

_Installation and/or improvement of thermal insulation in systems for producing, storing and distributing fluids for heating water (pipes and valves in hot water networks must be thermally insulated and protected from the weather as the lack of thermal insulation or the existence of degraded insulation leads to unnecessary energy waste);

_Check for and fix leaks, as well as checking and adjusting equipment temperatures and pressures;

_Ensure adequate maintenance to ensure that the installation performs adequately and is completely safe.

/ 4.4 LIGHTING — OPTIMISING ENERGY CONSUMPTION

4.4.1 WHY IT IS IMPORTANT / GOALS

Lighting is one of the main energy sectors responsible for inefficiency in buildings. It must provide an adequate environment for activities to be carried out in that location, with the lowest risk of accidents, in conditions that ensure visual and thermal comfort (exposure to low quality lighting over a long period can cause visual fatigue). It is important to keep lighting even, avoiding variations in brightness and darkness caused by the adaptability of the retina, such as excessive brightness or highly polished surfaces.

Colour temperature is an important characteristic in human behaviour and the use of warm lamps is related to activities that require lighting with a cosier environment, while cold lamps are related to environments where you want to stimulate production in some activity.

Lighting has a substantial impact on energy consumption in non-residential buildings (around 40% of electricity used). Depending on the circumstances, between 30% and 50% of the electricity used for lighting can be saved by investing in energy-efficient lighting systems.

4.4.2 GOOD PRACTICES

Here are some measures to promote energy efficiency in lighting:

_Choose the right kind of light bulb for each situation from those available on the market (an energy-saving electric light bulb consumes five times less power than a normal one);

_Choose suitable lampshades and be sure to clean and maintain them regularly for the most efficient results. Modern lampshades take the best advantage of the light flow, allowing a significant improvement in lighting;

_Installation of lighting control systems (integration of sensors activated by time, intensity and movement, etc.) so that the lights are switched on an remain on as and when necessary;

_Installation of natural lighting systems.

/ 4.5 EQUIPMENT — OPTIMISING ENERGY CONSUMPTION

4.5.1 WHY IT IS IMPORTANT / GOALS

Any equipment or installation that depends on a form of energy can be made more efficient. Some of the most obvious benefits resulting from concern with the energy efficiency of equipment and facilities are the reduction of energy costs, the increase in the useful life of the equipment and the reduced need for maintenance. Adequate preventative maintenance of equipment is essential in order to keep unnecessary consumption down.

4.5.2 GOOD PRACTICES

Here are some measures to promote energy efficiency in equipment:

_Shut down the motors of equipment when not in use;

_Check motor alignment and lubrication to minimise noise and vibrations;

_Prioritise the installation of high-performance motors that are similar in appearance to conventional ones, but have lower operating costs. The most significant characteristics of this type of equipment are energy savings (lower active losses and increased power factor), longer lifespan (resulting from the lower operating temperature), greater reliability, less noise (due to lower power ventilation) and improved response to harmonic frequencies and voltage variations;

_Correct sizing of motors (so that they operate with a load factor between 65% and 100%). Lower load factors lead to proportionally higher purchasing costs, poorer motor performance and lower power factors;

_Use of ESVs (Electronic Speed Variators) instead of throttle valves in flow regulation, bringing benefits in terms of the drive motor's energy consumption. ESVs allow smooth starting high motor torque availability, controlled reduction of the motor's power, active energy savings, improvement in the power factor, savings in corrective maintenance actions and increased productivity;

_Installation of capacitor banks to reduce reactive energy consumption (in addition to active energy, all electrical equipment whose operation is based on the effects of electromagnetic fields, such as motors, transformers and ballasts, consumes reactive energy that does not produce work, but is necessary for the operation of this type of equipment);

_Switch off office equipment (computers, monitors, etc.) when they are not being used for a period of time, e.g. during lunch breaks and at the end of the day. It is common for shared-use equipment, such as photocopiers and printers, to be left on overnight. You should create a routine of turning off this equipment at the end of the day and turning it on again the next day only when necessary;

_Choose the most efficient equipment based on its energy label.

/ 4.6 ENERGY EFFICIENCY IN MOBILITY

4.6.1 WHY IT IS IMPORTANT / GOALS

Energy efficiency and sustainability in mobility are based on the use of different means of transport that guarantee the decarbonisation of the sector. Public transport, for example, consumes considerably less energy per person than private transport, while lightweight mobility vehicles emit smaller amounts of greenhouse gases, benefiting everyone's health and enhancing the user experience. And there is also electric mobility, which requires significant adaptations to infrastructure and planning. Therefore, promoting energy efficiency in mobility is essential for reducing emissions.

4.6.2 GOOD PRACTICES

_Provision of infrastructure allowing easy accessibility and parking for light mobility vehicles (i.e. bicycles or scooters);

_Provision of charging infrastructure for our own electric vehicles, those of customers and other vehicles (e.g. buses that transport groups);

_Electrification of the company's own fleet and boosting its energy efficiency (e.g. through the energy classification of the MOVE+ fleet);

_Provision of space where public transport vehicles and bicycles can stop and park;

_Implementation of equipment and access that encourages the use of light transport vehicles;

_Provision of bicycles to customers;

_Encourage employees to use public transport, bicycles or car pools instead of everyone bringing their own car;

_Integration of fleet efficiency and sustainability criteria in processes for contracting goods and/or services that involve mobility services (e.g. transfers or delivery services);

_Raise customers' awareness of the importance of using public or alternative transport (such as cycling), for example through information panels, brochures, websites or other means.

/ 4.7 SWIMMING POOLS – OPTIMISING ENERGY AND WATER CONSUMPTION

4.7.1 WHY IT IS IMPORTANT / GOALS

Heating the water in a building's swimming pool is one of the main drivers of energy consumption, since the water needs to be kept at an acceptable temperature. Evaporation, filtration, pumping systems for water recirculation and the thermal power required to heat water are the causes of energy consumption. Energy efficiency in heating swimming pool water essentially involves two aspects: improving the efficiency of the hot water production system and reducing water heating needs.

4.7.2 GOOD PRACTICES

Here are some measures that can help achieve energy efficiency in swimming pools:

_Use the most appropriate technology for heating the pool water, preferably from renewable sources (solar thermal panels, geothermal, etc.), or equipment with a higher coefficient of performance (biomass boiler, cogeneration, heat pump, etc.);

_Improve the thermal insulation of the respective walls and bottom thereby reducing energy losses through conduction;

_Reduce evaporation losses by increasing the relative humidity of the air in the pool room, keeping it between 55% and 75%, or by fitting a curtain that covers the pool during periods when it is not in use;

_Carry out scheduled maintenance services for swimming pools on a regular and planned basis (e.g. measuring air and water temperatures, cleaning filters, etc.).

/ 4.8 LAUNDRY ROOMS – OPTIMISING ENERGY AND WATER CONSUMPTION

4.8.1 WHY IT IS IMPORTANT / GOALS

Energy consumption is a constant in laundry rooms, particularly when washing towels and employees' uniforms. Laundry services are often outsourced, and it is advisable to draw up a comprehensive list of pros and cons before taking the decision to outsource this service.

4.8.2 GOOD PRACTICES

Here are some measures to promote energy efficiency in the laundry rooms of thermal spa establishments that do their laundry in-house:

_Acquisition of laundry equipment (e.g., washing machines, dryers and ironing units) with a high energy efficiency rating and low water consumption (e.g. ozone washing systems, microwave dryers and tumble dryers with heat pump);

_When purchasing washing machines, choose those with the following features:

1) Two-way water intake (allows the use of mains water and water from alternative sources);

2) Machines that take in water heated by renewable energy.

3) Automatic load adjustment system (allows the machine to adjust the wash programme depending on the size of load);

4) Anti-flooding system or AquaStop (automatically blocks water intake when leaks are detected in the equipment drum and/or hose);

5) Recirculation of rinse water (functionality of semi-industrial or industrial machines that allows water from the end of wash cycle and which has a low pollutant load, to be reused for the washing process);

_Ensure the appropriate use of detergents for washing machines, using chemical product dosing systems and following manufacturers' guidelines, in order to avoid the need for extra water;

_Use of a centralised hot water production system (preferably DHW) instead of using the heating element in each piece of equipment;

_Recovery of residual heat from hot water and hot air from the drying process through the use of a heat pump;

_Regularly check the temperature of washing and drying machines, and use the machines at full capacity;

_Carry out scheduled maintenance services for laundry equipment (e.g. washing machines, dryers and ironing equipment) to ensure greater efficiency and lower energy consumption.

/ 4.9 LIFTS - OPTIMISING ENERGY CONSUMPTION

4.9.1 WHY IT IS IMPORTANT / GOALS

All operations to improve energy efficiency in lifts must be studied by properly qualified maintenance companies to ensure compliance with lift safety legislation. In order to reduce energy consumption in lifts, the following factors must be considered: energy performance when the lift is moving; energy performance with the lift on standby (inactive); the proportion of both operating modes, through the frequency of use and waiting/manoeuvring times; and the loss of energy derived from heat dissipation through the ventilation of the shaft.

There are measures that can be applied to and directly impact different types of lifts, helping to reduce the amount of energy they consume. Several measures take advantage of the long periods when a lift is inactive.

4.9.2 GOOD PRACTICES

Here are some measures to promote energy efficiency in lifts:

_Block simultaneous external calls in upward and downward directions;

_Switch off certain functions inside the cabin, when the lift is empty;

_Turn off the cabin light and display when it is inactive;

_Fit LED lights in the cabin instead of halogen lights;

_Reduce the starting intensity through an electronically regulated operating curve;

_Switch off the photoelectric curtain when the doors are closed.

/ 5. WASTE MANAGEMENT

/ 5.1 INTRODUCTION

Waste production impacts human health and the environment, either through the waste generated itself, which has to be collected, treated and disposed of, or through the associated waste of resources. Waste management integrates the activities necessary to control waste from its origin to its final destination, including collection, transport and treatment, whether through recovery or disposal.

These activities target the sustainable management of materials, with a view to ensuring the rational use of natural resources and easing pressure on ecosystems, in order to protect, preserve and improve the quality of the environment and human health. Waste management promotes the principles of the circular economy and reduces dependence on imported resources, providing new economic opportunities and contributing to long-term competitiveness.

Responsibility for waste management, including the respective costs, lies with the initial producer of the waste, and this responsibility may be extended, by law, to the producer of the product that gave rise to the waste and shared by the distributors of that product. This principle does not apply to urban waste, which is managed by municipal or multi-municipal systems.

Waste resulting from healthcare activities in the areas of prevention, diagnosis, treatment, rehabilitation or research are designated "hospital waste" and are classified into four groups, depending on how hazardous they are.

Group I: Waste treated as urban waste (does not require any special treatment). This group includes:

a. Waste from general services (such as offices, meeting rooms, social rooms, toilets, changing rooms, etc.);

b. Waste from support services (such as workshops, gardens, warehouses and others);

c. Common packaging and wrappers (such as paper, cardboard and others of the same nature);

Group II: Non-hazardous hospital waste (waste that is not subject to specific treatments and can be equated to urban waste). This group includes:

a. Uncontaminated disposable bed pads with no traces of blood;

b. Uncontaminated personal protective material used in support services;

c. Empty packaging of medicines or other products for clinical and/or common use, with the exception of those included in Groups III and IV;

Some non-hazardous hospital waste in Groups I and II is not suitable for recycling, namely organic waste, dirty paper, etc. and is to be disposed of in the bins for general waste. As yet, there are still no techniques or logistical systems that allow for dedicated collection and subsequent forwarding for recovery. Small non-recoverable waste must be deposited in specific containers, so that it can be collected and sent to a landfill.

Examples:

_Paper and paper packaging with grease or other dirt, including wipes, handkerchiefs and napkins;

_Empty non-recyclable packaging – without the green dot symbol;

_Uncontaminated personal protective equipment (gloves, aprons, masks);

_Leftover food.

Recoverable waste is equivalent to uncontaminated urban waste, such as paper/cardboard waste, plastic and metal packaging and glass containers, which can be deposited in multi-municipal recycling bins.

In addition to these three sub-groups, there are other types of waste produced in Healthcare Units that must be recycled: batteries and accumulators, light bulbs, ink cartridges and toners, electrical and electronic equipment, iron (cabinets and other obsolete furniture), waste resulting from renovations, usually called “monsters” which, as the name suggests, consist of large and diversified waste, for which there is still no recovery procedure, such as furniture (excluding those made only of iron). The process to dispose of this type of waste must be carried out in a timely and coordinated manner, and it must be transported to its final destination and recipient by companies duly licensed for these purposes (licensed operators), under penalty of fines for the holder/producer of waste. For construction and demolition waste, it is the developer’s responsibility to send it to an appropriate final destination.

Group III: Biohazardous hospital waste (contaminated or suspected contaminated waste, requiring incineration or other effective pre-treatment, allowing subsequent disposal as urban waste). This group includes:

a. Waste resulting from the administration of blood and blood products;

b. Systems used in the administration of serums and medications, with the exception of those in Group IV;

c. Personal protective material used in healthcare and general support services where there is contact with contaminated products (such as gloves, masks, aprons and others);

d. Contaminated feminine hygiene waste placed in aseptic containers;

Group IV: Specific hospital waste (waste of various types requiring mandatory incineration). This group includes:

a. Sharps: needles or other invasive material;

b. Rejected drugs, when not subject to specific legislation.

The Integrated Electronic Waste Registration System (SIRER) is an information system that allows the registration, submission and storage of data relating to the production and management of waste, products placed on the market that are covered by legislation relating to specific waste flows, and waste covered by declassification schemes. This system is integrated into SILIAMB (Integrated Environmental Licensing System) and

allows the registration of entities and people, the submission and transmission of data and the consultation of information.

Data relating to produced and managed waste are submitted during the annual reporting campaign, by completing the Integrated Waste Registration Map (MIRR).

/ 5.2 MEASURING AND REDUCING IMPACTS

5.2.1 WHY IT IS IMPORTANT / GOALS

All organisations can cause impacts related to the production of waste resulting from their activities. The quantity, type and quality of waste generated are a consequence of the activities involved in the production of the organisation's services (e.g. extraction, processing, materials purchasing process, product or service design, production or distribution). Assessing how materials move into, through and out of the organisation can help understand where these materials become waste, helping to identify opportunities for waste prevention and the adoption of circularity measures. This will allow the organisation to go beyond mitigating and repairing the negative impacts resulting from waste production and move on to managing waste as a resource.

Waste reduction occupies the top place in the waste management pyramid. We must focus on the quantitative and qualitative reduction of waste, striving to cut down on the amount produced as well as its harmfulness. We need to go beyond simply reducing the amount of waste to be collected and transported, and make every effort to cut it down to an absolute minimum, as well as reducing the harm caused by the waste generated.

Choosing products, packaging or other materials that can be used multiple times will allow us to reuse them.

Waste sent for recycling can be repurposed through various processes aimed at eliminating the disposal of this waste to landfills, incinerators or other cost-incurring treatments.

5.2.2 GOOD PRACTICES

Here are good practices to adopt for efficient waste management:

_Identify waste produced in all sectors of activity;

_Ensure that all waste is properly classified according to the European List of Wastes (LoW);

_Set out internal waste logistics, specifying the origin of the waste, sorting operations to be carried out, where the waste is to be put, frequency of collection, transporters, recipients and operations to which it will be subject);

_Issue/authorise Waste Consignment Notes (WCNs) for each load of waste transported (when applicable);

_Ensure that Waste Management Operators are duly authorised to carry out the management operation they propose, for each particular waste product;

_Complete the annual register of waste produced and sent to the designated operator (Integrated Waste Registration Map - MIRR);

_Improve the selection of materials and the design of products/services, taking into account their longevity, durability, recyclability, etc.;

_Reduce the use of raw materials and finite materials, replacing them with raw materials and used/recycled materials or renewable materials;

_Make it a policy to purchase from suppliers that have solid waste prevention and management criteria in place, and prioritise purchasing in bulk or large formats over small packaging;

_Participate in collective waste producer responsibility systems by delegating to an entity duly licensed for the purpose (for example, membership of Sociedade Ponto Verde for

managing packaging waste placed on the market or other similar systems).

Waste should not be seen as rubbish, but as a resource, with recovery being the next level in the waste management pyramid, where there is transformation into raw material for other uses. This process is fundamental to the sustainability of resources.

Disposal consists of the final disposal of waste. It is the last option that should be taken, only after ensuring that the waste cannot be reused, recycled or recovered. Depending on the type of waste to be disposed of, the most common means are stabilisation and disposal in a controlled landfill, and thermal treatments (incineration, co-incineration).

So:

_Ensure that there are specific instructions on the separation and internal management of waste in the various spaces;

_Ensure that the separation and classification of waste takes place in the same place where it was generated (containers for separating different waste in different spaces);

_Use a compactor for paper and cans (volume reduction);

_Compost organic waste, or hand it over to an accredited company;

_Forward Verdoreca waste, which is sent to the municipal collection system, according to the respective Verdoreca contract;

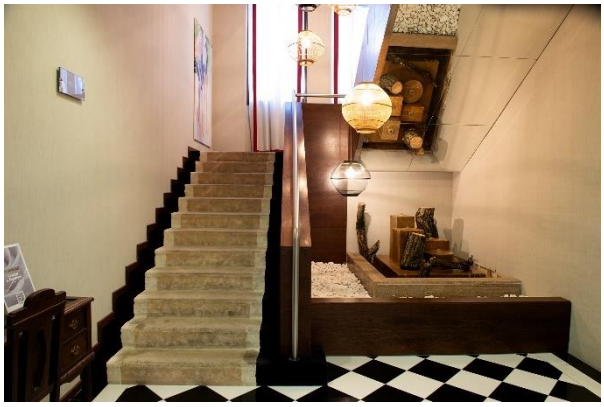
_Put measures in place to reduce waste: e.g. use of larger volume packaging and purchase of products with returnable packaging or the largest usable size possible;

_Hazardous waste must be sent to duly licensed operators.

/ 6. EQUIPMENT AND INFRASTRUCTURE

/ 6.1 WHY THEY ARE IMPORTANT/GOALS

Maintenance is a process that consists of carrying out certain tasks aimed at keeping specific assets (equipment or installation) in a condition such that they can fulfil their function, while taking into account the lowest possible cost. It has been proven that maintenance is one of the fundamental bases for the proper functioning of equipment. Therefore, the interpretation of this concept and its aspects is essential in order to guarantee good production performance, increase the end quality of the product/service, increase safety for employees, improve and guarantee a good institutional image, preserve acquired assets and, above all, increase the economic profitability of the processes. In short, the purpose of maintenance is to boost and enhance production with minimum costs.



/ 6.2 GOOD PREVENTATIVE MAINTENANCE PRACTICES FOR EQUIPMENT AND INFRASTRUCTURE

Thermal spa establishments must keep an inventory of all their equipment and records detailing maintenance carried out on it. It is important to maintain an updated list of all equipment in use and to collate all of the relevant information about it. This would include data relating to the purchase and supplier; general and technical characteristics; status (in operation or out of service); movement records; a record of any interventions carried out (e.g. maintenance, breakdowns or calibrations); equipment maintenance plan; calibration plan; and the constituent parts of the system/equipment.

It is good practice for all equipment to have a physical cataloguing label.

Corrective maintenance takes place to remedy an issue after it has been detected. The aim is to restore the equipment to a state that will allow it to perform its required function.

Anticipating problems, preventing possible breakdowns and, consequently, equipment downtime, is the main focus of preventative maintenance. This is the most effective way to prevent the premature deterioration of equipment, avoiding unscheduled stoppages and equipment malfunctions, and increasing its profitability.

Thermal spa establishments must set out a preventative maintenance plan for their facilities and equipment. The maintenance plan will include provisions for periodic checking of facilities/equipment, according to the need and/or specific legislation and regulations in force. This document must include the planning of regulatory reviews and inspections, as well as the periodic inspection (at least annually) of measuring and calibration facilities and equipment. The preventative maintenance plan must include checking the correct functioning and conservation of the equipment as well as all necessary routine operations, the main goal being to anticipate potential breakdowns and thereby avoid compromising the normal functioning of the spa.

Each thermal spa must have a “Facilities Book” that will function as an equipment log, detailing all of the revisions, inspections, repairs and outcomes for each item of equipment. The establishment must also ensure that there are mechanisms in place whereby anomalies in the facilities, detected either by employees or customers, can be logged and reported.

6.2.1 THERMAL SPA FACILITIES: GOOD MAINTENANCE PRACTICES FOR TREATMENT AREAS

All elements that make up the equipment of a treatment area/annexe must be in good condition and in good working order, and must be repaired or replaced whenever anomalies are detected.

This includes all of the spa's equipment, appliances and facilities directly associated with the provision of services, in addition to those used for treatments - including changing rooms, relaxation rooms, consulting rooms, swimming pool equipment, etc.

Equipment and areas/annexes can be considered to be functioning properly and adequately maintained when:

a. The walls, floors, furniture and decorative elements do not present any appreciable flaws or defects;

b. Lighting conditions are adequate and operational;

c. The temperature, degree of humidity and ventilation/air renewal is adequate, taking into account the type of area within the spa establishment: ventilation must allow natural and permanent air renewal, without causing uncomfortable or harmful draughts, and air conditioning must offer good conditions of temperature and humidity to ensure the well-being of those using the facility (in accordance with current legislation);

d. Appliances and equipment are functioning properly and comply with the requirements of the services provided and/or regulations;

e. Plumbing elements and taps are functioning properly, with no leaks; there must be water points providing water fit for human consumption next to the treatment areas so that it can be used to sanitise the facilities;

f. In areas/annexes where spa-goers must dress/undress, totally or partially, there must be a suitable space for the purpose, with sufficient chairs and hangers;

g. Accesses to the spa's facilities and equipment, as well as all areas where the floor may be damp or wet, must have non-slip flooring. Said flooring must be of a nature that allows it to be kept appropriately clean for the activities that will take place in the area in question and must not be conducive to the proliferation of microorganisms;

h. Facilities/areas for individual use (cabins), without surveillance, must have a visual or audible alarm mechanism that, when activated, will result in immediate assistance by the service personnel. These systems must guarantee the display of the call or alarm from the location where they are activated, and they must only be able to be cancelled by qualified personnel at that location. The alarm system terminals are positioned so that they can be reached by a person lying on the floor after a fall or by a person in a wheelchair.

/ 7. MANAGING THE IMPLEMENTATION OF GOOD ENVIRONMENTAL SUSTAINABILITY PRACTICES

/ 7.1 IDENTIFYING AND QUANTIFYING CONSUMPTION

In order to take action, the most important thing is to identify the starting point. To do so, we must monitor, characterise and quantify the establishment's consumption.

This will make it possible to control and characterise energy consumption hotspots, establish consumption patterns and intervene with a view to greater rationalisation, awareness-raising and improvements that lead to greater efficiency and energy transition.

To achieve this, both the energy consumed and produced must be identified and quantified:

Total fuel consumption with indication of:

_Non-renewable sources by type of fuel used

Non-Renewable Sources[2]

Propane Gas

Natural gas

Electricity

Heat Pumps

Diesel

Petrol

_Renewable sources by type of fuel used

Renewable sources[3]

Photovoltaic panels

Solar panels

Geothermal energy

Biomass

Hydroelectric energy

Wind energy

Special care must be taken to ensure that records are not duplicated in the various establishments that produce part of the energy they consume or sometimes sell; the formula below can be used to determine the total energy consumption within the organisation.

Total energy consumption within the organisation

Total energy consumption within the organisation	
=	Non-renewable fuels consumed
(+)	Renewable fuels consumed
(+)	Electricity, heating, cooling and steam purchased for consumption.
(+)	Self-generated electricity, heating, cooling and steam that are not consumed.
(-)	Self-generated electricity, heating, cooling and steam sold.

Source: GRI 302: Energy 2016

[2] Non-renewable energy source - an energy source that cannot be replaced, reproduced, cultivated or generated in a short period of time through ecological cycles or agricultural processes.

[3] Renewable energy source - an energy source that can be replaced in a short period of time through ecological cycles or agricultural processes.

/ 7.2 CHECKING GOOD PRACTICES/BASE CRITERIA

In addition to the more specific and individualised good practices in terms of action and which have already been reported in previous chapters, it is important at this stage to implement certain practices and criteria that allow a general analysis with regard to the type of energy consumed. This will then be followed by further, more in-depth and detailed analysis that is more specific to these establishments.

Therefore, once the energy consumption of the establishment is known, it is important also to know the practices in place and how the energy is used. In this respect, suggested checks are:

_HVAC being one of the areas with the highest energy consumption in an establishment, it is recommended whenever possible to have the possibility of direct allocation for the thermal area (wet zone) and another for the dry area, thereafter using the criterion of allocation per m2 for each;

_In the case of establishments that have both a heated indoor pool and laundry facilities, these must be kept separate in terms of energy and water control;

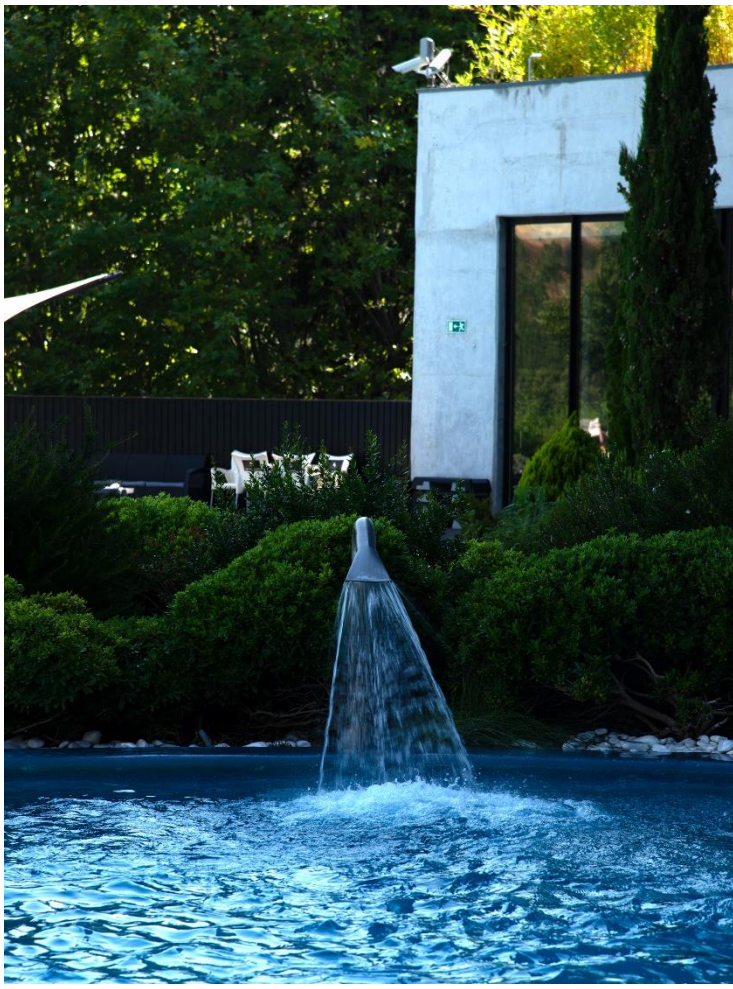
_Whenever possible and with regard to electrical equipment, allocate the "power" by equipment and by sector of the establishment, based on an estimated number of operating hours for the equipment;

_For other consumption that cannot be calculated, establish rules to estimate amounts.

_A building housing a thermal spa establishment can be rather complex from a technical point of view. Therefore, in addition to design excellence, centralised technical management (CTM) should be chosen whenever possible. This is a cost that can easily be recovered. A well-sized and operationalised (CTM) system can add savings of 24% to traditional facilities, and this is increasingly an essential element in a building's energy efficiency strategy, as we move towards higher levels of demand.

/ 7.3 DRAWING UP AN ACTION PLAN

Not only is our world constantly changing but the pace of that change is being accelerated by climate change. As such, it is important that spa establishments adapt to these new realities and implement measures to recognise good sustainability practices.



To this end, spa establishments must:

_Define their goals (some of the indices presented below can used for guidance, indicating the goals to be achieved);

_Set measurable and attainable targets;

_List all tasks that must be performed;

_Set deadlines (e.g. an annual deadline with monthly monitoring;

_Delegate tasks;

_Create a visual representation of the action plan and its development;

_Predict, whenever possible, risk situations and contingency plans;

_Monitor the progress of actions.

/ CHAPTER TWO. SOCIAL AND CORPORATE

/ 1. SOCIAL AND CORPORATE PERFORMANCE

/ 1.1 EMPLOYEES (OR) LABOUR PRACTICES, PREVENTION AND SAFETY

Assessing the internal and external situation of each organisation, it is important to develop and apply effective actions so that social responsibility becomes part of the company's culture.

1.1.1 GOOD PRACTICES

_Promote employability and quality of employment, particularly for young people, creating conditions for the exercise of parenthood;

_Facilitate the reconciliation of professional, personal and family life: promotion of effective practices of harmony within the framework of labour relations, in particular flexible forms of work, in accordance with the roles and responsibilities of each employee;

_Promote the integration and hiring of people from the region, integration of people with disabilities and also immigrants, in order to contribute to diversity, equal opportunities and demographic and territorial sustainability;

_Assess performance, encourage feedback and periodic appraisals to understand and assess employee satisfaction and motivation;

_Innovate and digitise repetitive and bureaucratic tasks in order to facilitate and optimise employees' daily work;

_Invest in the continuous training of employees, an essential tool for developing solid, quality work and for the professional development of the team through training appropriate to the skills required for the job;

_Aim for gender balance in terms of the functions performed, setting gender balance as a goal and monitoring the relationship between the average salaries of employees of both genders, as well as overall coherence in the annual process of merit-based promotion;

_Promote a differentiated pricing policy for services provided to employees;

_Set up an internal communication channel, in order to transmit the company's communications to the respective teams and carry out activities that promote a good working environment and that disseminate the integration and commitment of employees to the company's values and mission;

_Draw up an onboarding handbook for new employees to help them settle in and provide them with all the information considered essential for successful integration;

_Draw up a handbook on good water and energy efficiency practices for employees, and conduct annual training on these topics;

_Establish protocols with entities that allow employees to obtain discounts and economic and social benefits;

_Pinpoint situations that are of interest to employees and draw up a list of them;

_Host trainees for integration into the business environment and/or acquisition and improvement of skills.

Where occupational safety is concerned, emphasise prevention, encouraging continuous improvement in the assessment, control and mitigation of risk factors, namely:

_Define a procedure that establishes the Personal Protective Equipment (PPE) to be used in each area and department (taking into account the area's specific regulations);

_Train and raise awareness on the adoption of safe behaviours and the detection of non-conformance;

_Carry out awareness-raising campaigns on self-protection measures to promote health and well-being in the workplace;

_Draw up and provide information on specific procedures for handling substances.

/ 1.2 SOCIETY

Relationships with the community are an important aspect of social responsibility and strongly contribute to good corporate citizenship and local and regional development. Active participation in local activities helps enhance a company's corporate image and employee loyalty, as well as having a positive impact on public opinion.

1.2.1 GOOD PRACTICES

_Involvement in and support for community projects, which promote physical and social well-being;

_Collaboration and support (logistical/financial) for the promotion of cultural, social or sporting initiatives or non-profit organisations;

_Prioritise local sources when acquiring products and services (give preference to local suppliers and who are in compliance with ESG); Integrity and Human and Labour Rights

_Establish partnerships with local traders to obtain advantageous prices for employees, in turn helping to encourage them to buy from these same local traders;

_Involvement of employees in social solidarity actions, as well as sharing goods with people in need and in financial, economic or emotional difficulties, with the aim of helping the most disadvantaged enjoy a better quality of life;

_Internal dissemination and encouragement of participation in solidarity campaigns (e.g. blood/bone marrow donation, food, etc.);

_Listen to and raise awareness among the local community about the importance of thermal spas and their role in local, regional and national development;

_Differentiated pricing policy for services provided to the local community;

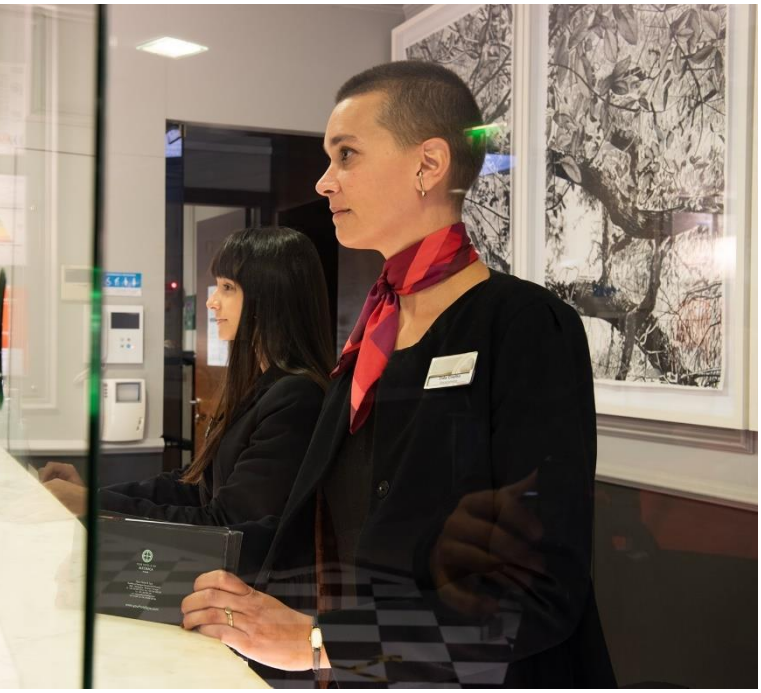
_Raise awareness among customers and tourists about sustainable practices to adopt during their stay by carrying out awareness-raising, training and adoption of good practices;

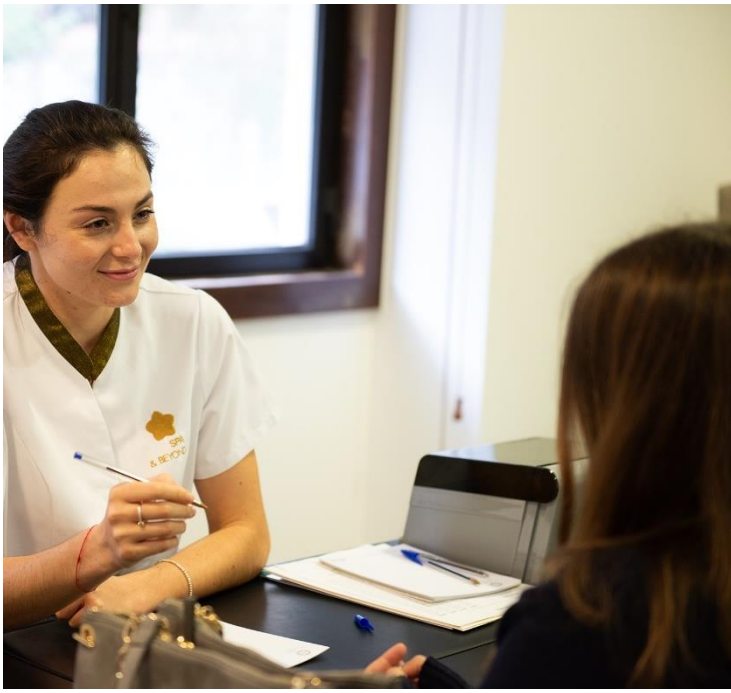
_Regular stakeholder consultation is considered fundamental for the definition and subsequent validation of strategic options and for understanding the expectations of the main interested parties.

/ CHAPTER THREE. GOVERNANCE

/ 1. INTRODUCTION

Governance plays a fundamental role in ensuring the inclusion of social and environmental issues in the management structure and decision-making process.





/ 2. GOOD PRACTICES

Build a governance structure that gets people involved, values sustainability and fosters responsible, transparent, adequate and inclusive conduct, as well as complying with the law, all with a view to creating value in the medium and long term:

_Adopt a governance structure that promotes transparent management and where communication is a top priority. Clear and correct information disseminates effective and streamlined messages;[4]

_Transparency vis-à-vis investors, customers, suppliers and employees;

_Access to useful and reliable information;

_Perceive and understand customer needs and provide true and clear information about products and services.

_Value suppliers who are close to the area of activity and forge reliable and lasting relationships. Provide open and transparent two-way communication with employees about activities and strategies;

_Implement channels that facilitate internal and external communication;

_Create an area dedicated to institutional information on the organisation's website, e.g. the organisation's statutes, governing bodies, budgets and plans, reports and accounts and other indicators;

_Business ethics: formalisation of an organisational code of ethics and conduct;

_Promote gender diversity in management and leadership positions;

_Development of materiality matrix: Identification of sources of medium and long-term value creation. Assertively define the most important topics to be advanced by the organisation, taking into account the interests of the main internal stakeholders (administration, employees, investors, customers and suppliers) and external stakeholders (government, community, social media and NGOs). Once the topics have been decided upon, priority actions must be defined. It is important to remember that the organisation is unlikely to have the resources to address all of topics at the same time, so establishing priorities will be fundamental;

_Risk Management: identify and draw up a list of the organisation's risks/vulnerabilities. It is important to categorise and evaluate them based on criteria such as probability and impact generated. Draw up a Risk Prevention and Mitigation Plan and strategies;

_Optimise management processes, particularly financial ones, in order to improve and facilitate work routines, allowing the reinforcement of the strategic role in the organisation.

[4] Note: Pay particular attention to information security. Transparency does not mean undue access to the organisation's internal data. Ensure the confidentiality of internal information, such as customers' personal data, among others.

/ CHAPTER FOUR. BENCHMARKS

/ 1. NATURAL MINERAL WATER

Taking into account the location where the natural mineral water for thermal spa use is collected and its relationship with the morphological, geological and hydrogeological aspects of the site, Termas de S. Pedro do Sul decided to implement an external monitoring system in the areas surrounding the location in order to support decision-making about the water flows being exploited and also human actions on site. This monitoring system is organised into three main components:

_double piezometers to determine groundwater levels, conductivity and temperature, and sampling for physical/chemical quality control, particularly heavy metals; each piezometer has two tubes, one more superficial (at a depth of 3 metres) and another deeper one (at a depth of 6 metres) in order to investigate the situation at different levels;

_a meteorological station with rainwater collection system for physical/chemical analyses;

_a rainwater sampler, to collect water resulting from runoff from the parking area and subsequent physical/chemical analysis.

Thanks to this external monitoring system, we can obtain greater knowledge of various environmental components, allowing us to foresee and avoid contaminants being washed down into the areas surrounding the natural mineral water catchments as a result of percolation of rainwater or runoff on contaminated land. We are thus able to help protect the natural mineral water aquifer system.

More detailed information can be found in the work "Good practices of quality control in the area surrounding of natural mineral water abstraction of São Pedro do Sul medical spa (Portugal) by Ferreira Gomes, LM; Jorge, A.; Rodrigues, L. (2021). IOP Conf. Ser.: Earth Environ. Sci.; 906 012092, 10p., *doi:10.1088/1755-1315/906/1/012092;* https://iopscience.iop.org/article/10.1088/1755-1315/906/1/012092/pdf

/ 2. WATER EFFICIENCY

Water efficiency is fundamental to the sustainability of water resources.

Created by ADENE – Energy Agency to promote the efficient use of water, AQUA+® "Água na medida certa" (Water in the right measure) (http://www.aquamais.pt/) is a voluntary system for evaluating and classifying the water efficiency of buildings. In addition to classifying the water performance of buildings, audits conducted by qualified professionals facilitate the identification of good practices and improvement measures in the design of new buildings or in rehabilitation work, enhancing the option for equipment, systems and solutions that lead to more efficient use of water. Meanwhile, the AQUA+ benchmark simplifies the regular monitoring of the evolution of water performance and compliance with established goals.

/ 3. ENERGY EFFICIENCY IN MOBILITY

Within the framework of efficient mobility, ADENE - Energy Agency created the MOVE+ concept (https://www.movemais.pt/) through which it provides companies with instruments based on efficient mobility auditing and classification models.

These instruments make it possible to classify the energy and environmental performance of practices adopted for mobility management, guiding public entities or companies as they strive for eco-efficiency.

For example, the classification makes it possible to determine the energy efficiency of a vehicle fleet on a scale from A+ (the most efficient) to F (the least efficient). And at the same time, it identifies opportunities to save fuel (cost reduction) and minimise the environmental impact when the vehicles are in use.

MOVE+ certification is currently available for light vehicle and heavy goods vehicle fleets, and will also be extended to include heavy passenger

/ 4. SOCIETY

“The Old Baths symbolise the identity and history of the town of Caldas das Taipas, in the Municipality of Guimarães. Roman in origin, this space operated as a thermal spa from 1753 until the mid-1970s, at which time the facility was abandoned and lay unused for almost 30 years. Nevertheless, this site has always been hugely symbolic for the local population and the almost imperative restoration of the building took place in 2010, transforming it into a culture and leisure space, with spring and summer activity programmes."

/ 5. GEOTHERMAL ENERGY

This pilot project positions Chaves as one of the most avant-garde cities in the drive for decarbonisation.

Chaves is preparing to create the largest "geothermal" urban heat network in mainland Portugal, a pilot project that will initially benefit a total of 24 buildings with a renewable and clean energy source. Thanks to the high temperature of the territory's thermal waters, the municipal council plans to take advantage of the geothermal potential to create an urban heat distribution network, which will enable 19 new public and private buildings to be air conditioned.

This sustainable project will contribute considerably to reducing the municipality's carbon footprint. Annual savings of 1,330 tons of carbon dioxide are expected, thus promoting decarbonisation through a smart solution that will boost energy efficiency while reducing consumption.

Geothermal energy is already being used in five facilities in Chaves: the thermal spa complex, the municipal swimming pool, two hotels and a geriatric centre in the city.

/ CHAPTER FIVE. SUSTAINABILITY REPORT

/ 1. INTRODUCTION

The sustainability and ESG management report of organisations in the spa sector aims to incorporate a set of indicators into their internal processes that will allow the measuring and monitoring of their performance in the environmental, social/corporate and governance domains, appropriate to the size and type of operator.

The methodology adopted for the Sustainability Report is adapted from the structure of the ESG – Environmental, Social and Corporate Governance report (360° Companies Programme - GRI methodology).

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_ENVIRONMENTAL PERFORMANCE

_SOCIAL AND CORPORATE PERFORMANCE

_GOVERNANCE PERFORMANCE

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/ 3. REFERENCE INDICATORS FOR THE ENVIRONMENTAL PERFORMANCE OF THERMAL SPA ESTABLISHMENTS

SEE APPENDIX - Energy performance indicators for thermal spa establishments

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