

ENERGY. STUDENT HANDBOOK

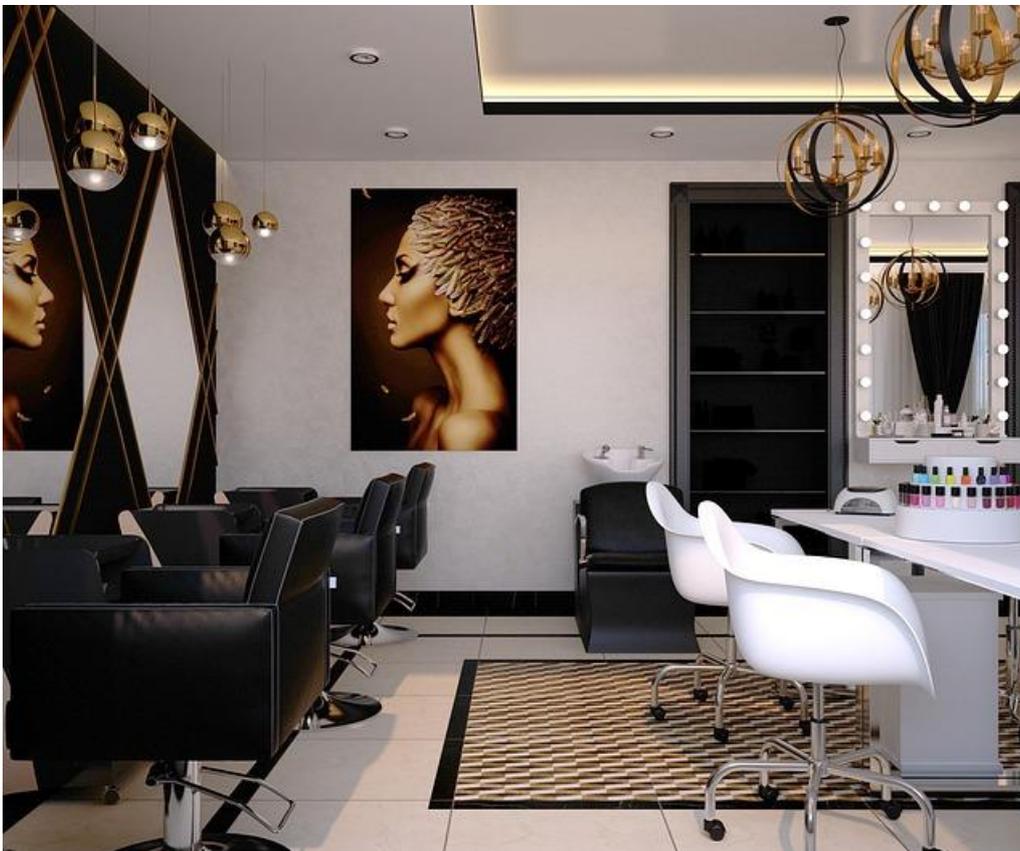
LEVEL 2

Energy in the hairdressing salon I.

We hope that the previous unit has helped you to understand what energy is and where it comes from. We have also tried to clarify some concepts such as the differences between renewable energies and clean energies and how we can all make small gestures to save and thus improve the environment. Remember that the first thing we learn is what we do in our homes and therefore, if we have managed to make you aware of the importance of saving energy in your daily life, we are sure that you will also do the same in your hairdressing salon.

As a professional hairdresser, you have a great responsibility and opportunity to be what is called a "dynamic agent of energy transformation", not only because of the measures you can incorporate in your salon with the corresponding benefit to yourself, but also because of the example of good practices and sustainable measures you can offer to your clients and employees.

To help you in this task, in this topic you will learn about the conditions for the efficient use of energy systems that are commonly found in the workplace, as well as techniques to improve the consumption habits of workers, raising their awareness and responsibility towards the environment. In short, we are going to offer you some guidelines so that your hairdressing salon becomes a cleaner and more energy-efficient organization.



1. Energy suppliers
2. Reduction of consumption in the salon.
 - a. Lighting.
 - b. Tools and tools (battery or plug?)
 - c. Household appliances.
 - d. Air conditioning.
 - e. Water heating.

1. ENERGY SUPPLIERS

As you already know, green energy, also known as clean energy, is non-polluting energy that comes from inexhaustible resources provided by nature, which is why it is progressively gaining importance as, by not producing polluting emissions, it helps to combat climate change.

This energy is generated and fed into the general electricity distribution grid, where it is not really distinguished from energy that is not of renewable origin. For this reason, it is the marketer that guarantees its origin as it is obliged to provide the user with the Certificate of Guarantee of Origin of the electricity, issued by the National Commission for Markets and Competition (CNMC).



The guarantee of origin certifies that a specific amount of kilowatt hours (kWh) of electricity has been generated through renewable energies. Thus, to assure users that the energy they will consume in their homes is green, the Guarantee of Origin and Labelling System for Electricity was created within the European framework.

But how do I select the best electricity supplier for my salon from the available options?

SELECTING ENERGY SUPPLIER

In order to select the most suitable supplier, there are a number of important factors to consider. Obviously price will be the determining factor, but there are also a number of other factors to take into account.

To simplify the selection process, here are some fundamental points to bear in mind in order to make an intelligent choice that meets all your needs:

Analyze the profile of the available options: in general, you should assess the characteristics of the suppliers, taking into account their position, activity, track record,

prestige, quality standards, technology and infrastructure, and capacity to respond to contingencies. It is not a bad idea to know the opinion of other companies or clients who have worked with them.

Calculate your energy consumption: it is essential to assess how you use energy and whether your consumption rate is in line with the average according to the characteristics of your business. In a hairdressing salon, consumption is usually high, but compare it with previous years and assess whether it has remained the same, increased or decreased in proportion to the volume of business. Whatever your case may be, later on we will see measures to reduce consumption and, thus, the cost that is paid on a regular basis.



Compare the tariffs of different companies: price is often the most important selection criterion. Determining your average annual consumption will allow you to calculate the fee you would pay with other companies. Also assess aspects such as payment options and possible discounts offered by the supplier, but always carefully study the conditions of the different contracts, making sure that they include all possible supplements or taxes.

Be critical of quality and after-sales service: In the energy market, as in any other, a low-priced supplier is of no use if his products or services are not of high quality. But, just as important as quality or price and prestige, is the after-sales service. Study the guarantees, the advice received, the response of the technical service and, very importantly, the customer service and support when you need it.

Value the corporate philosophy on sustainability and its ethical principles: when deciding on a supplier, knowing the environmental impact of electricity use, we must also prioritize the protection of the environment and the conservation of natural resources by choosing trading companies that distribute green energy, with which energy consumption will be much cleaner and less polluting.

In short, in addition to the economic and service advantages offered by the suppliers, the added benefits of green energies are:

- Profitability
- Easy maintenance
- Energy independence (no dependence on purchasing from third parties)
- Energy efficiency
- Sustainability
- Environmental protection
- Conservation of natural resources (energy obtained from inexhaustible energy sources)

You should bear in mind that the most powerful companies in the market already offer green energy tariffs to their customers, despite continuing to use non-renewable sources. In

addition, there are small suppliers specialised in green energy that do not offer any other non-sustainable product. A final option would be renewable energy cooperatives, for which a monthly membership fee has to be paid to join the organisation.

2. REDUCTION OF CONSUMPTION IN THE SALON

For too long, business and environment have been opposing concepts and this is one of the causes of the climate change that we are clearly suffering today. For this reason, it is necessary to implement "eco-efficient" measures to achieve what we call "sustainable development", i.e. to achieve a reduction in environmental impact while maintaining the level of production.

To achieve this, it is necessary, among other measures, to reduce consumption in numerous areas, energy being one of the most significant and with which, as long as we are aware, we can have an impact at all levels, one of which, not insignificantly, is the economic savings that can be achieved.

The initial fronts to work on to improve electrical performance in our salon will be:

- a. Lighting.
- b. Tools and tools (battery or plug?)
- c. Household appliances.
- d. Air conditioning.
- e. Water heating.

a. LIGHTING

One of the main areas of consumption in the salon where changes can be made to improve efficiency is lighting. Reducing consumption can be tackled on several fronts and with different methods. Some of the most important ones are mentioned below:

Making the most of natural light: using sunlight whenever possible is essential, for which the installation of windows and/or skylights is recommended, as well as transparent or translucent glass panels to separate spaces and use mirrors to multiply the light, thus making the most of sunlight. The same concept applies to windows and/or shop windows, which should be unobstructed, avoiding curtains or other elements that block the passage of light.

If total transparency is not desired, acid-etched matt glass can be used, although it would be advisable to place the matt areas strategically, as the light flow is slightly reduced by them.



The only exception to this rule is in particularly hot climates, as this would increase air conditioning consumption.

Decoration and paint: walls and even furniture should be light-coloured to reflect light, as dark paint or furniture absorbs a lot of energy.

Volumetric: in areas lacking natural lighting, such as bathrooms, corridors or storerooms, it would be interesting to install volumetrics to detect movement

and prevent them from remaining on while the area is not in use.

Artificial lighting: considering that despite the availability and use of sunlight in the room, the use of light bulbs in many cases is unavoidable, the use of LED lights should be considered as their consumption is much lower and their duration much longer. These bulbs should also be placed close to and/or oriented towards the mirrors so that they reflect the light, doubling their output. An interesting fact is that a 100W incandescent lamp operating for 50 days emits 43 kg of CO₂ into the atmosphere, while a similar LED only emits 5 kg.

Intelligent lights: an interesting option is the use of intelligent lights that detect the amount of ambient light and regulate themselves to achieve a pre-set light output, so they would be operating at maximum in total absence of light and would be regulated to switch off according to the intensity of natural light.

Clean the lamps: it may seem silly but it is essential as the lighting level drops if the luminaires are dirty, which could lead to more light points being switched on, which is totally unnecessary when regular cleaning is encouraged.

b. TOOLS... BATTERY-POWERED OR PLUG-IN?



Over the years, the "modernization" of equipment has involved the elimination of cables, something that may seem convenient at first glance but is extremely harmful to the environment, as batteries are not only made with toxic elements and substances, but everything that works with batteries has a much shorter useful life, which means more waste and the need to renew equipment, generating waste that degrades and has a high polluting power.

This applies to a multitude of equipment, the purchase of which we should consider whether the environmental cost is worth the benefit obtained (as we have already said, it is

not). And in this bag we can include a lot of equipment, those used in hairdressing salons such as hair clippers or others such as hoovers, smart watches, etc.

In this respect, the only battery-powered items that are spared are laptops, as their technology has evolved so much that on average they consume 80-90% less than desktops, resulting in significant savings and lower CO2 emissions. In fact, the most efficient desktop computer still consumes 10 times more than many laptops.

c. **SMALL AND LARGE HOUSEHOLD APPLIANCES**

In a hairdressing salon we can find numerous electrical appliances, we call small appliances those ranging from classic plug-in tools such as irons, hair dryers or similar, to coffee machines or microwaves. Large appliances include washing machines, tumble dryers and refrigerators, for example.

The purchase or renewal of any of these appliances, especially large appliances, but also small appliances as they are investments for work, are important decisions that should not only be based on the design or performance of the different devices, but should also consider energy efficiency as a decisive selection criterion.

First of all, if you are going to renovate or buy, consider whether you really need it. Avoiding unnecessary and/or excessive consumption is essential to alleviate the climate crisis. Make a real list of your needs: how often will it be used, what needs are we going to cover, how long do we want it to last, how much space do you have, etc. Finally, choose a sustainable and environmentally friendly appliance and, if possible, one that has artificial intelligence, as home automation can help to reduce the energy bill.

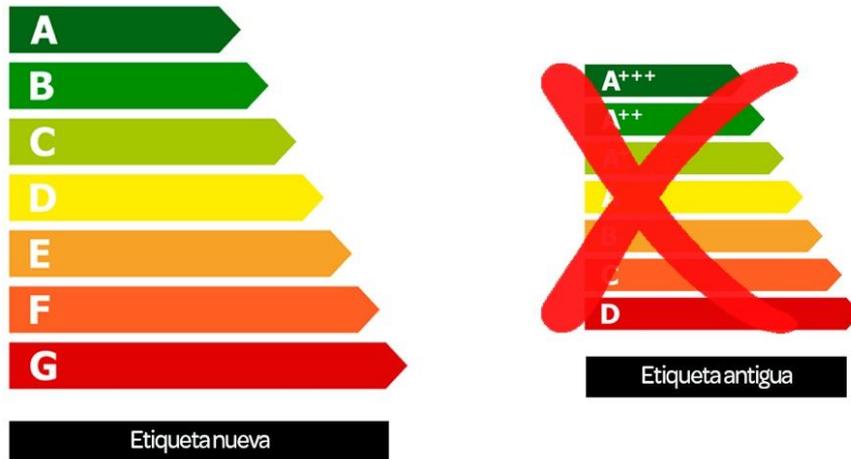
But how do you determine whether an appliance is energy efficient? It has been 25 years since the EU consumer bodies created the energy label, which is an identification based on a series of technical controls and certifications that allows consumers to know the degree of energy efficiency of each household appliance. European regulations oblige distributors to display the label.

How to read this label? In the past, they were organized in 7 levels, from A to G and within A there were 3 categories, with A+++ being the most efficient label.

Therefore, household appliances were classified as follows:

- A+++ , A++ and A+ , green in color, for appliances with a high level of efficiency.
- A and B , in orange and yellow for medium-consumption appliances.
- C and D , in shades of red, for energy-intensive appliances.
- However, in March 2021 there was a change in energy labelling, according to EU Regulation 2017/1369, and they are now categorized on a scale ranging from A to G.
- The A+ , A++ and A+++ categories disappear.
- Category A is reserved for new appliances with higher efficiency and technology and, for the time being, this category is deserted as efficiency improvements are foreseen in the future.

- Category B now covers those previously classified as A+++.
- A, B and C are represented by shades of green.
- D and E are represented by yellow and orange
- Categories F and G are represented by reddish colours.



Despite this, market research shows that, even today, consumers still generally value price over efficiency, as energy efficient appliances are on average 15% more expensive. However, it seems that the reality that, in the medium term, efficient and sustainable appliances contribute greatly not only to the environment, but also to significantly lowering the electricity bill, so that the initial investment is more than compensated for, has not yet fully sunk in.

Finally, in addition to making a conscious choice when purchasing or renovating, measures to reduce consumption can also be implemented in the maintenance or use of these appliances, such as:

- Unplug appliances that are not used frequently, such as coffee machines or microwave ovens.
- Avoid keeping equipment switched on in stand-by mode, because although it may not seem like it, it is also consuming energy.
- At night, unplug all electrical equipment not needed at that time, including hairdryers, appliances and so on.
- Keep computers in economy mode when they are not in use (screen savers also consume energy) or switch them off if they are not going to be used regularly.
- Avoid batteries whenever possible and, if not possible, use rechargeable batteries.
- Make sure that the equipment is energy efficient; even some that do not carry the official energy efficiency label. In hairdryers, irons and other electrical items, there are "green" options that get the same power for much less consumption.
- If you are going to use the washing machine, tumble dryer or other similar appliance, always do it cold and with a full load.
- Whenever possible, avoid tumble drying and air dry towels.
- Schedule any appliances you can, such as the washing machine or tumble dryer, to run during the cheapest tariff hours.

- Use programmable sockets to charge equipment with a battery during the cheapest tariff hours.
- Keep equipment maintenance up to date so that everything runs smoothly and you can check that no energy is wasted.

d. AIR CONDITIONING

To function properly, the body must be at an internal temperature of between 36 and 37°C. When this temperature is maintained without any physiological effort (sweating or shivering, for example), we are in a state known as thermal comfort.



The definition of thermal comfort is included in the ISO 7730 standard as "That condition of mind in which satisfaction with the thermal environment is expressed", i.e. the temperature at which we are neither hot nor cold, which is essential when selecting or programming the air conditioning of the hairdressing salon, as it is a key element in providing the well-being that allows us to feel comfortable for both professionals and clients.

However, air conditioning alone can account for up to 35% of total energy consumption and is also a major generator of carbon dioxide, making it a priori neither economical nor sustainable; however, there are different ways of adapting air conditioning to maintain an environmentally friendly consumption.

Tips for efficient use of air conditioning:

Insulate your salon properly: a well-insulated workplace has fewer energy losses, so it is important to study the possibilities for improving insulation in walls, windows and doors, as well as in roofs and ceilings if necessary, which is where around 30% of energy losses occur.

Ventilate the salon and make the most of sunlight: good ventilation is necessary to ensure clean air, but it also has an impact on energy savings as it cools a warm room. In addition, in warm weather it is also advisable to use blinds that block the passage of sunlight, while in winter, the sun shining on the windows can make it possible to reach the ideal temperature without turning on the air conditioning system or keeping it to a minimum.

Install awnings and/or opaque and semi-transparent blinds: in hot climates, awnings are a very effective external parapet against the heat as they constitute a first barrier against the sun's rays, reducing the heat by up to 90% depending on their type and/or orientation without losing the view of the outside. Blinds are also very practical for maintaining air conditioning. There are models of different opacities depending on the need.

Take advantage of automated systems and promote connectivity: the use of thermostats in air-conditioning systems leads to more effective and efficient use. The thermostat avoids the constant temperature variation that leads to higher costs. Study what the ideal indoor temperature is and stick to it; it is a mistake to turn on the equipment by selecting the minimum or maximum temperature so that it cools or heats more quickly, as it will take the same time but it will cost much more because it does not stop when the desired temperature is reached.

On the other hand, the possibility of controlling the equipment via WiFi makes it possible to automate more efficiently actions such as switching on and off or managing the temperature of the air conditioning equipment.

Regulate the temperature: one of the main keys to the efficient use of air conditioning equipment is to regulate it so that the ambient temperature remains close to 21°C in winter and 25°C in summer. Bear in mind that each degree more or less can mean an increase of up to 8% in the electricity bill.



Don't forget maintenance: regular maintenance of the equipment and its components (filters, pipes and others), preferably carried out by the Official Technical Service of the commercial company of your air-conditioning system, will guarantee correct operation, thus favoring energy savings, avoiding damage to the units and extending the useful life of the equipment. However, if the building has air conditioning systems that are more than 15 years old, they will not be very efficient, so it is recommended to replace them with new ones with the highest energy rating, as they will have energy-saving technologies (inverter in cooling, modulating in heating, among others).

Choose the best air conditioning system for your premises: opt for integral and efficient solutions that you can use both in summer and winter. Do not hesitate to consult with professionals in the sector so that they can recommend the system that best suits your room, as there are many factors to take into account: location, orientation, climate zone, surface area, distribution, number of workers and workstations, etc., but it is also interesting to know the two standards that determine the performance of the equipment: SEER and SCOP.

The most efficient air conditioner will be the one that offers more kW of cooling or heating per kW consumed. This ratio is the SEER (Seasonal Energy Efficiency Ratio) data for cooling mode and SCOP (Seasonal Coefficient of Efficiency) in heating mode; therefore, to find out the energy efficiency of an air conditioner you only have to compare the SEER or SCOP of the equipment, as the one that is higher will be more efficient and, therefore, will have lower consumption.

This table can serve as a guide:

	SEER	SCOP
A+++	<8,5	<5,1
A++	>8,5	>4,6
A+	>6,1	>4,1
A	>5,6	>3,6
B	>5,1	>3,1
C	>4,6	>2,6

Supplement air conditioning: air conditioners alone regulate the temperature and guarantee thermal comfort, but we should not disregard other equipment that reinforce their efficiency and can even improve air quality, thus benefiting health and reducing consumption, such as dehumidifiers, humidifiers and fans.

High levels of relative humidity in the air not only increase the sensations of cold and heat, but also encourage the appearance of bacteria, mites, mold and fungi. Conversely, low levels of relative humidity dry out the mucous membranes of our respiratory system, also affecting the skin and hair and even the furniture. Dehumidifiers and humidifiers regulate the ambient humidity so that it stabilizes at the ideal values, which would be between 30 and 50%, more humidity if the climate is warm and less if it is cold.

In another category, but no less important, we find the fans, which are the most economical and efficient devices that can be used to cool the spaces, generating a current of air that manages to reduce or increase the thermal sensation depending on whether they are used in summer or winter mode. Unfortunately they cannot be used in all areas of a hairdressing salon, as there are areas, such as those where volatile chemical products are used, where their use would be inadvisable, but with good design and space planning, their use significantly increases the energy efficiency of the salon.



e. WATER HEATING

The moment of washing the hair is one of the most gratifying for the client in the hairdressing salon and a large part of the protagonism, apart from the professional's hands, is the flow and temperature of the water, which is why it is essential to always have hot water available for the client. However, it is also one of the salon's major sources of expense, as many liters of water are consumed and, for this reason, in addition to trying to reduce water consumption, which we will discuss in other units, an efficient water heater must be installed.



The type and capacity of the water heater to be used in the salon will depend directly on the number of workers and heads washed in a salon. It is estimated that 3 workers wash approximately 9 heads per hour. Another factor to take into account when choosing a water heating system is the space, as hairdressing salons are not always large businesses.

Traditionally, electric water heating systems have been used in preference to combustion systems, despite the latter being more economical, as the installation, gas supply and flue requirements are unfeasible in many halls.

When it comes to electric water heating systems, the industry has not stopped researching and innovating, coming up with more and more sustainable options.

Electric water heaters with a tank: their initial installation and maintenance are simple. The cost of the system is not high and the space they occupy is proportional to their capacity, which must be selected according to the needs of the room. Their disadvantages are the electricity consumption during the heating time and the recovery rate. On the other hand, in these systems it must be taken into account that the temperature of the water must exceed 60° to prevent the presence and proliferation of the "legionella" bacteria, and to maintain it constantly, so we can install temperature regulators known as mixing valves at the outlet of the water heater, which allow us to optimise the flow of water by mixing it with cold water.

Despite being a very standardised system, the useful life of these heaters is not very long (8 to 12 years), and what was a not very high initial investment, ends up needing replacement, a factor to be taken into account in the long run.

Tankless/instantaneous electric water heaters: they involve an initial economic investment, their great advantage is that they do not take up much space, but electricity consumption is high at the time of use and a high electrical power contract is required, currently averaging around 8 kW, but they do not generate expenses while they are not in use. Although the industry continues to improve them, they have not reached the expected efficiency because they do not provide a high flow rate compared to other heating systems although, to solve this problem of flow rate, there are combined systems of instantaneous heaters with accumulators, designed for rooms with more than 4 washbasins that need to be used simultaneously but, as in the case of accumulator water heaters, the water temperature must always remain above 60°C.

Gas water heaters: First of all, it must be taken into account that these heaters are not instantaneous, so we lose liters of water until it reaches the washbasin, which could be recovered with the installation of water recirculation systems.

There are different heaters depending on the type of gas used, such as butane, propane and natural gas, all of which are economical systems in terms of infrastructure and the capacity to produce hot water on demand, without the need to maintain the temperature in an accumulator. These systems can be installed in rooms that meet the installation requirements, as they require the expulsion of gases to the outside, ventilation grilles for leaks and temporary inspections carried out by official bodies.

Consumption of different types of heaters:				
Type of heater	Features	Average consumption	Energy efficiency	Price (approx.)
Butane gas	Containment canister to be replenished each time a canister is used up	1-2 cylinders per month about 150-225 kWh	High	15-30€
Propane Gas	Cylinders of different sizes, up to 35 kg. and larger tanks	One 11 kg domestic cylinder about three weeks - 1 month about 3700 kWh.	Media	13€
Natural Gas	Piping from a central hub and distribution throughout the house via pipes	Using gas for domestic water, power and heating, an average of 5050 kWh is consumed.	High	75-80€
Electric	Tank for water, which is distributed throughout the house	Energy consumption is much lower. About 2800 kWh	High	60€
Solar	Solar panel system, water tank and piping connecting to the household installations	Electricity consumption is centered on the solar panel and thermosyphon system. About 1.5 kWh	Very high	Depends on the system installed
Instant	A system of internal electrical heating elements that heats the water as it passes through its piping circuit.	Energy consumption around 3000 kWh	High	50-150€

We hope that after reading this didactic unit, you have learned how to select the best energy supplier for your salon that benefits your pocket and the environment, and that it has helped you to remember and/or learn multiple gestures and actions with which we can consume less energy or maximize its performance. However, we know that you will continue to ask yourself many questions as a hairdresser who needs electrical energy for

your profession. We invite you to further explore this topic in the level 3 didactic unit: "Energy in the Hairdressing Salon II".

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