

ENERGY. TOOL KIT

LEVEL 3

Energy in the hairdressing salon II.

The tools needed for teaching are:

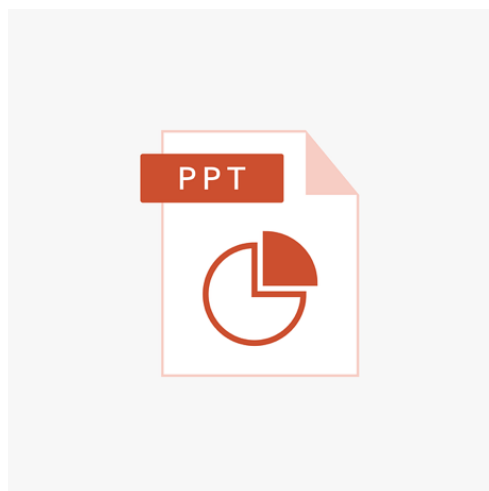
- Power Point presentation.
- Activity sheets.
- Computers with Internet connection.
- Projector or digital whiteboard.

CONTENTS

1. Legislation.
2. Green-globe energy consumption calculator.
3. Digitisation for savings.
4. Innovation and efficiency to reduce consumption.
5. Cost of investments. Financing and subsidies.

Power Point presentation:

Linked to this link (click on the picture)



1. LEGISLATION

Sessions 1-6.

Activity Sheet:

Activity 1:

Research the legal requirements for energy installations in your locality, share this with the group and discuss whether these regulations contribute to sustainability.

Local legislation on energy installations		Locality:
Electricity		
Heating		
Hot water		
Other		

Other resources:

Video 1	https://www.youtube.com/watch?v=b1LQSezKxnA Video on how China plans to conquer the future of energy.
Video 2	https://www.youtube.com/watch?v=w-wINiOMYeY Video with statements by the Canadian International Energy Agency on its energy policies to curb climate change.

2. CALCULATING ENERGY CONSUMPTION

Sessions 7-13.

Activity sheet:

Activity 2:

After analysing the annual electricity costs for the use of 100W bulbs of 950lm that you can read in the example of point 2 of the topic, you opt to change them for LED lights of similar lumens; it is cheaper than you thought: 25€ and they have a consumption of 9.5W so, to confirm if it is a good investment, you make the calculation.

What will your annual lighting consumption be once LED lights are installed?

Activity 3:

Discussion with colleagues: LED lights have a much longer lifetime than incandescent bulbs:

- Does the change to LEDs pay off?
- What if the bulbs we have are energy-saving?
- What do you think of the waste generated?
- Can filament bulbs be recycled?
- Can energy-saving light bulbs be recycled?

Share it with the rest of your colleagues.

Activity 4:

Conduct research on the hair dryer market and enter the information obtained in the table below. Find at least 5 different brands and/or models and analyse which one is the winner in terms of quality/price/energy efficiency.

Share it with the rest of your colleagues and establish a ranking of the three best and most efficient hairdryers.

DRYER COMPARISON	
Brand	Gamma Più
Model	IES (intelligent electric saving)
Power (W)	1.250 W
Noise level	68 dB
Weight	500g
Accessories	Nozzle
Ionic	No
Further information	100% recyclable casing and box. Special resistance for maximum efficiency.
Price	90€

Once this is done, do the annual calculation if used 4h/day, 6 days a week and compare the most and the least efficient of all the dryers.

Activity 5:

The climazone is used, among other things, to reduce the time that colouring products need to remain in the client's hair. Thanks to the temperature it reaches, it manages to reduce this time by 25%.

If we consider that the colour has to stay on the hair for 30-40 minutes, the use of the climazone only saves 7 to 10 minutes.

Research the power of the climazone you have in your living room and calculate how much money you would be saving annually if you avoid using it, assuming it is used for 6 hours per week on a regular basis.

Would it be feasible to consider other options? Evaluate the following possibilities, their advantages and disadvantages compared to the current energy saving results obtained.

- Ask the customer to wait an extra 10 minutes while being offered a tablet with downloaded magazines or a coffee.
- Wrap the hair in cling film to take advantage of the warmth of the scalp.
- What other measures or options can you think of?

Calculator in Excel table:

Linked to this link (click on the picture)



Activity solution book:**Solution activity 2:**

Step 1	<p>If there are nine bulbs in a room and each bulb is 9.5W, the total wattage consumption of the lights can be found by multiplying the number of lights by the watts they consume.</p> <p>Consumption in W (9 bulbs) = $9 \times 9.5\text{W} = 85.5\text{W}$</p>
Step 2	<p>To find out the watts per hour, we need to know how long they are on for. Let's consider that they are on for 9 hours.</p> <p>$85.5\text{W} \times 8\text{h} = 684\text{ Wh}$</p>
Step 3	<p>Now, to determine how many megawatt hours this is, as this is the variable that appears on electricity bills, we divide the number of watt hours by 1,000,000.</p> <p>$684\text{Wh} \div 1.000.000 = 0,000684\text{MWh}$</p>
Step 4	<p>The lights are generally on for eight hours each day, five days a week, and on Saturday only for four hours:</p> <p>$(8\text{h/day} \times 5) + 4\text{h} = 44\text{ hours/week}$</p>
Step 5	<p>If we consider that about 40 weeks a year are worked, we have:</p> <p>$44\text{h/s} \times 40 = 1,760\text{ h/year}$</p>
Step 6	<p>Finally, to know the energy consumed in a year, we must multiply power x hours per year:</p> <p>$0.000684\text{ MWh} \times 1,760\text{ h/year} = 1.20384\text{ MWh/year}$</p>
Step 7	<p>To calculate the cost of this for the hairdressing salon, the price per MWh has to be multiplied by the price per MWh, which is 85.80 in January 2023.</p> <p>$1.20384\text{ MWh/year} \times €85.80 = €103.29$ annual expenditure for the hairdressing salon bulbs alone.</p>
Step 8	<p>Considering that with incandescent bulbs the consumption was 1.087,3€ per year, the saving is $1.087,3€ - 103,29€ = 984,01€$.</p> <p>Even subtracting the €25 investment made for the bulbs, this would still leave a saving of almost €960.</p>

Activity 3:

Filament bulbs cannot be recycled while energy-saving bulbs can.

Solution activity 5:

Step 1	If our climazone is 1,500W, to know its consumption, multiply it by the number of hours it is in operation: $(1,500W \times 2h/day) \times 6 \text{ days/week} \times 40 \text{ weeks/year} = 720,000Wh/year$
Step 2	Now, to determine how many megawatt hours this is, as this is the variable that appears on electricity bills, we divide the number of watt hours per year by 1,000,000. $720.000Wh/year \div 1.000.000 = 0,72MWh/year$
Step 3	To calculate the cost of this for the hairdressing salon, the price per MWh has to be multiplied by the price per MWh, which is 85.80 in January 2023. $0.72 \text{ MWh/year} \times \text{€}85.80 = \text{€}61.78$ annual cost that the salon could save.

3. DIGITALISATION FOR SAVINGS

Sessions 14-20

Activity sheet:**Activity 6:**

Research on the Internet about the different home automation systems and prepare a presentation in which you include the elements that you would incorporate in the perfect sustainable living room to optimise energy consumption.

Describe how you would combine these elements together to get the most out of the salon. You can build on an existing salon or design one from scratch.

Present your presentation to your colleagues.

Other resources:

Video 4	https://www.youtube.com/watch?v=53PeEdJIPfM Video on how to have a smart home that will minimize energy consumption with multiple systems.
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4. INNOVATION AND EFFICIENCY TO REDUCE CONSUMPTION

Sessions 21-22

Activity sheet:

Activity 7:

Debate:

Based on what you have studied, do you think that changing premises would be an irrational decision?

It raises advantages and disadvantages in the different scenarios.

5. COST OF INVESTMENTS. FINANCING AND SUBSIDIES (EUROPEAN AND LOCAL LEVEL).

Sessions 23-24

Activity sheet:

Activity 8:

Find out if there are any financial subsidies for the installation of renewable energy sources in your locality, and indicate the requirements for accessing them.

Share it with your colleagues.

Theoretical test:

Session 25.