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THE TENANT'S MANUAL:

A GUIDE TO RESPONSIBLE ENERGY MANAGEMENT

ENERGY WATER COMFORT

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ENERGY WATER COMFORT

THE TENANT'S MANUAL:

A GUIDE TO RESPONSIBLE ENERGY MANAGEMENT

This manual is a guide to the management of some of the activities performed daily at home. You will learn how to reduce energy consumption, helping both the environment and your finances, through small but very effective actions.

Responsible consumption management is easier than it seems, it does not involve changing your habits and it lets you see concrete savings in the very first bills.

"We cannot solve problems with the same thinking we used when we created them"

(sentence attributed to Einstein)

We must ask ourselves whether we want to do something in order to save money.

SUMMARY

KEYWORDS

Kilowatt hour unit of measurement of electrical energy consumption [kWh]

Visible spectrum Wavelengths that emit colours perceivable by the human eye, with frequencies ranging from 800 to 400 THz (Tera Hertz).

Emission spectrum Light bulbs emit light when an electric current passes through them. The emission spectrum indicates the visible colours.

Thermo-hygrometric well-being comfort condition. This depends on environmental factors, temperature, humidity and luminosity.

Instantaneous consumption electricity consumption at a specific moment. Useful for seeing standby power consumption.

Heat pump heating machine that uses free energy from the environment to reduce electricity consumption.

Set point temperature maximum temperature that the heating system can reach. It can be set by the user.

Induction cooktop technology used to cook by transforming magnetic energy into heat.

Kilocalorie amount of heat required to raise the temperature of 1 litre of water by 1 degree Celsius [kcal].

Payback period length of time needed for an investment to recover its initial outlay in terms of savings.

Thermography analysis that makes it possible to see the surface temperature of an object. It is used mainly to detect where energy is dissipated.

Hygrometer an instrument that measures the percentage of humidity in the air.

Tax deductions and reimbursements tax reductions for renovation and improvements in energy efficiency.

Bonus Mobili 50% Irpef deduction for the purchase of furniture and large domestic appliances. (For changing to classes A ++ and A +++).

Renovation bonus 50% Irpef deduction for renovating.

Conto Termico 2.0 partial reimbursement for energy efficiency improvements.

GOOD HABITS FOR SAVING MONEY

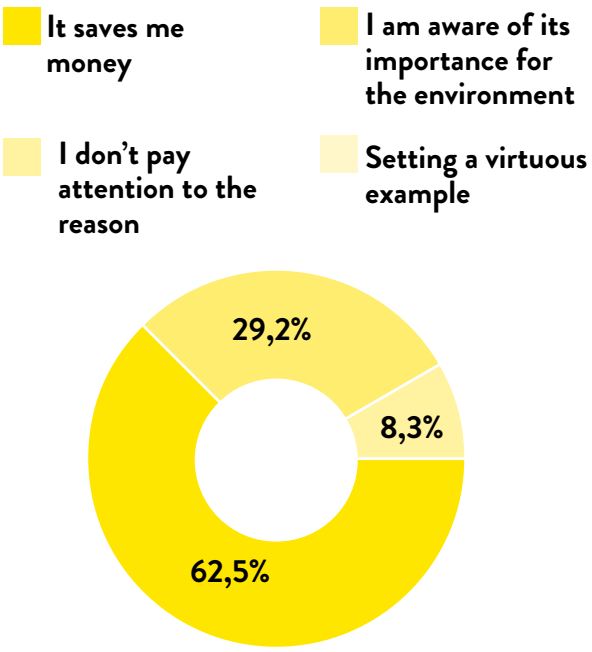
Energy is a key element in our lives. If we try to imagine what our lives would be like with no lighting or hot showers we realize how complicated it would be to do without them. On the other hand, **energy is not free: there is a cost to pay both in terms of bills and environmental pollution.**

What should we do to reduce this cost, should we give up hot showers or the washing machine?

This manual is intended as a support to the practical application of energy saving solutions, taking care not to place too many restrictions on lifestyle habits and to provide real and easily comparable financial information.

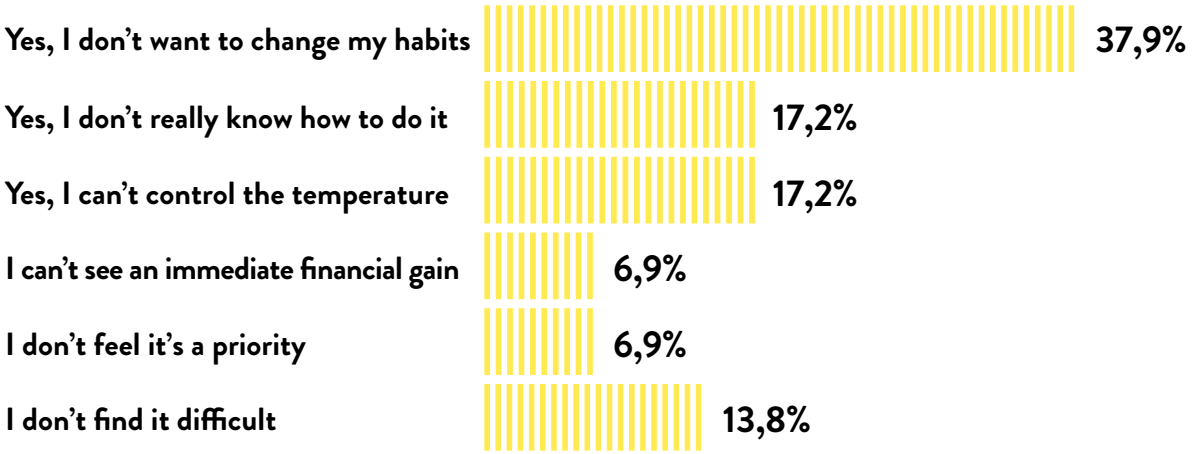
«Is there a particular reason that drives you to reduce your energy consumption?»

Most of the respondents, 62.5%, stated that they were interested in saving energy for financial reasons.
Only 8.3% of respondents stated they were indifferent about their energy consumption levels.



«Do you find it difficult to save energy?»

Almost half of the respondents fears that saving energy necessarily means changing their habits.
We will see later how saving energy is not so hard to do.



There are actions that have a very small impact on our habits, a minimal initial cost, and result in significant savings

As part of the LEMON Project, a questionnaire for tenants was prepared. The questionnaire was designed mainly to understand the needs of tenants, particularly those in social housing, in order to provide recommendations for optimizing energy consumption, water consumption and improve indoor home comfort. It is a tool that can help compilers to take into consideration whether to apply good practices within their home.

← Many respondents expressed difficulty in saving energy. Some don't want to give up their habits, others say they wouldn't know how to save energy.

You can find it attached to the manual; you can also find and fill out on the website **www.progettolemon.it**.

Throughout the manual there are short excerpts presenting some of the tenants' questionnaire answers: it can be interesting to find out how other people deal with the daily management of their homes. The questions presented in this chapter help us think about the tenants' interest about energy savings and the often underestimated barriers that prevent the dissemination of best practices.

LESS ELECTRICITY

This section of the manual is a collection of examples for the management of daily household activities. Lighting, domestic appliances and the television set all use electricity, and we can't and don't want to do without them.

1. SMALL ADJUSTMENTS, BIG SAVINGS

Can we save energy without compromising our comfort? The answer is yes.

Consuming more means paying more. Would we accept to pay double to have air conditioning? Or to use a light bulb with 10% efficiency? Responsible consumption management is easier than it seems. We will learn how to reduce energy consumption, helping both the environment and your finances, through small but very effective actions.

Energy consumption can be reduced by 20% simply by changing a few habits. And 20% of consumption is equivalent to an average saving of 17% on the electricity bill!

2. STANDBY POWER CONSUMPTION, A TRUE HIDDEN TREASURE

Standby indicates the mode of electrical appliances when they are patiently awaiting a signal from us to reactivate and perform the function for which they were purchased. Appliances in this mode consume a lot of electricity while doing practically nothing. This is due to current flowing continuously through the internal power supply so that the appliance can be ready to respond to our needs; one example is turning on the TV or the air conditioner with the remote control.

HOW DO I DETECT STANDBY POWER CONSUMPTION?

We can do a very simple test to find out how much we are consuming without using electricity. We just need to look at the meter and press repeatedly the button on the right of the display, when we are sure that everything in the house is turned off. Pressing the button will display first the client code, then the current time band and, immediately after, the instantaneous power consumption reading. That value is equivalent to standby consumption (and possibly to consumption of the fridge).

Using power sockets with on/off switch is a simple and cheap way of reducing consumption.
A convenient switch socket (cost: about €5) can save us up to €40 a year if connected to the TV/audio system and have very positive effects on our health and the environment. It's not necessary to turn off the switch every time: it's enough to do so at night or when leaving for several hours.

A very clear example is the wall-mounted air conditioner: 2 months of non-intensive use (a couple of hours a day) cost about €35, the same as what it costs in the other 10 months, while switched off.

Leaving the computer plugged in when not using it is a useless expense and a harmful practice. It keeps the current keep flowing through it, causing wear and tear on the computer. All power supplies, even those of cell phones, wear out more quickly if they are left plugged in. A typical family of 3 spends about €650 a year on electricity. Standby power consumption of electrical appliances is about €100.

← **Standby power consumption accounts for about 15% of a family's total household consumption. From a financial point of view, these figures amount to a tidy sum!**

APPLIANCE	STANDBY POWER CONSUMPTION (Kilowatt hours)	IN A YEAR (Kilowatt hours)	ANNUAL COST (€ - approximate)	NOTES
32" LCD TV, non smart	5	45.000	9,00€	Just one switch socket could result in savings of €40 a year.
DVD/Blu-ray player	2	18.000	3,50€	
Game console	15	140.000	28,00€	
Wall-mounted air conditions	20	180.000	36,00€	You use it for just a few months, you pay for it all year round! - Unplug it at the end of the season.
Computer laptop	8	70.000	14,00€	A computer that is always plugged in adds to your electricity bill and wears out sooner.
TOTAL (example of a small three-room apartment: 2 TVs, 1 DVD player, 1 air conditioner, 1 game console and 1 laptop)	**55**	**498.000**	**100,00€**	**€100 of energy wasted in a year without even using it.**

As for the environmental benefits, if every Italian family reduced its electrical consumption by 500 kWh (**kilowatt hours**), no less than 10.000 gWh (gigawatt hours, equivalent to 1.000.000 kilowatt hour) would be saved in a year, about half of what is produced by all the photovoltaic systems installed in Italy and 5 times as much as is produced by all the photovoltaic installations in the Emilia-Romagna region (2016 production, source: GSE).

WHAT CAN WE DO TO START SAVING IMMEDIATELY?

- Connect your TV, home theatre and game console to the same switch, and turn it off at night and when going to work. You will notice an immediate difference in your electricity bill.
- Turn off the air conditioner switch when you don't need it any more to avoid a consumption equal to that of the two months when it's in use.
- Unplug your computer to save electricity and extend battery life.

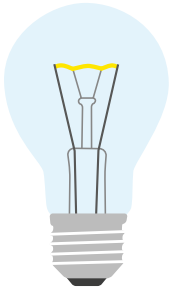
3. LIGHTING - COMPARISON OF DIFFERENT TYPES OF LIGHT BULB

The selection of light bulbs seems to hold no secrets for us any more. Energy-saving light bulbs feature in every home and LED technology is widely used. However, "traditional" incandescent tungsten filament light bulbs are still found in our homes in the form of the most recent, yet energy-consuming, halogen light bulb. This is due mainly to the fact that they have some indisputable advantages: they light up immediately and have an excellent range of colours, especially in comparison to fluorescent light bulbs.

Let's now look at some characteristics of the three main types of light bulbs that we can find on the market.

INCANDESCENT LIGHT BULBS

They were invented more than 100 years ago and since then have remained virtually unchanged in terms of appearance and efficiency. This lends a vintage charm to a product with an initially extremely low cost. Their working principle is very simple: electricity runs through a tungsten filament, which overheats and emits radiation. Only 5-7% of the latter becomes "light".



They have a very limited lifespan, on average around 1.000 hours, as the current flow wears out the filament. Because of their high energy consumption, a few years ago they were phased out and replaced by halogen bulbs, which can save a little on the electricity bill.

cost	low
lifespan	1-3 years
dissipated energy	85-90%
recyclability	100%

FLUORESCENT LIGHT BULBS

Another category of widely used light bulbs is the one commonly referred to as energy saving ones. This type of light bulb has an medium/low initial cost, a lifespan of about 6.000 hours and limited energy consumption. While they have many advantages compared to traditional light bulbs, they also have a few significant drawbacks. Because of their starting process, they take longer to turn on and produce the required amount of light, making them inadequate when instant lighting is needed. Also, they cannot cover the entire light spectrum, producing an unpleasant light that can be uncomfortable for the eyes.

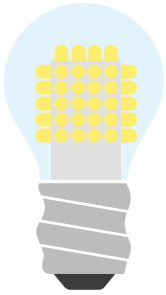
A final consideration about this type of light bulb is their toxic content, as they contain a noble gas mixed with mercury, though in minimal amounts. Therefore great care must be taken not to break them and they must be recycled in the appropriate manner.

cost	medium
lifespan	6-8 years
dissipated energy	10-15%
recyclability	non recyclable parts

LED LIGHT BULBS

The final category we are analysing is LED technology, Light Emitting Diode, through which it is possible to convert almost all the electricity into light, thus ensuring savings. LED light bulbs are more expensive than both incandescent bulbs and energy-savings ones. They have, however, great benefits: a medium lifespan of more than 10.000 hours, very low energy consumption and an exceptional range of colours, even better than of incandescent bulbs, thus reducing eye fatigue.

Finally, the variety of shapes and the attention paid to their appearance makes them interesting design objects.



cost	medium-high
lifespan	10-15 years
dissipated energy	7-10%
recyclability	100%

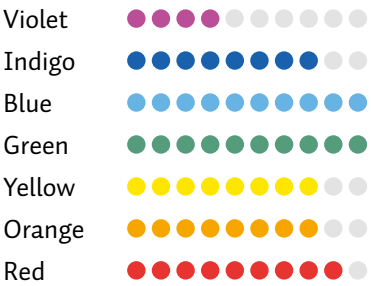
4. LIGHTING AND COSTS - WHAT TO CHOOSE?

When choosing a light bulb there are several factors to consider: their appearance, the quality of lighting they provide and their cost. We can base our choice on the importance that each one of these factors has for us or on a combination of them. The important thing is to make a responsible choice.

QUALITY OF LIGHTING

The sun is an almost perfect light source that can light all the colours of the rainbow. In terms of quality, light bulbs cannot provide light in the same way as the sun, as some have problems with the cooler colours (blue, green) and some with the warmer colours (red), while others can only light a small range of colours.

SOLAR LIGHT



In terms of energy consumption it is not possible to convert all electricity into light, as some of it turns into heat, dissipates and adds to the electricity bill.

Let's try to analyse the set of colours made visible by the three different light bulbs, comparing them to what can be seen through sunlight at midday. Let's keep in mind that warm colours are the most important ones for good lighting.

Traditional and halogen light bulbs have a good light spectrum, with a strong predominance of reds and some problems with cool colours like green and pale blue. They cannot reproduce blue.

Fluorescent light bulbs have a very limited light spectrum. The light they produce can highlight only a few specific colours, such as green and orange. The difficulty in reproducing yellows and reds makes the light feel "fake" and tiring for the eyes. This aspect also leads to lower productivity.

LED light bulbs provide a full light spectrum. They are excellent at producing warm colours. They also produce rather well the green and blue colours that other technologies have trouble with, therefore resulting in a light that resembles sunlight much more closely than that of its competitors.

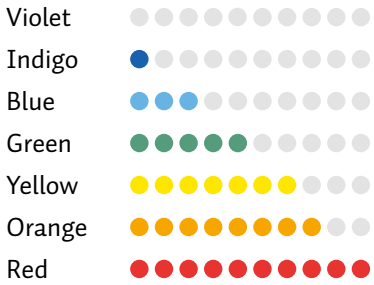
THE COSTS OF THE DIFFERENT TECHNOLOGIES

With the same level of illumination, traditional incandescent light bulbs require a lower initial investment compared to energy-saving and LED bulbs. Until a few years ago, the difference in price was considerable. Also, LED light bulbs used to be less efficient than today, so that it was hard to justify the expense. But now the situation is very different.

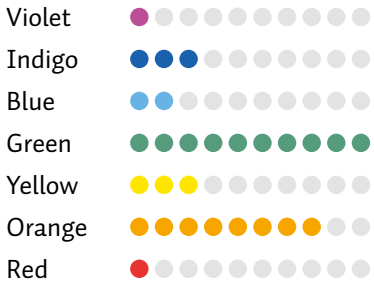
LED technology has made great strides, narrowing the price gap with competitors and compensating for it with a longer lifespan. Nowadays you can find good quality LED light bulbs for under €5. The cost of fluorescent light bulbs is lower than that of LED bulbs, but not enough to justify purchasing them given their drawbacks.

A rapid examination will show how convenient prices do not translate into real convenience.

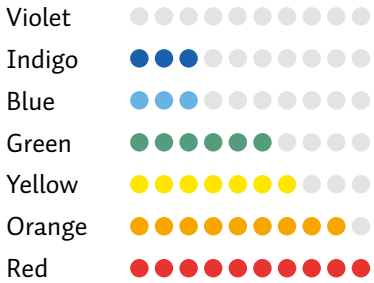
INCANDESCENT LIGHT BULBS

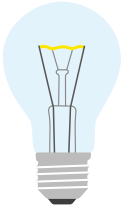
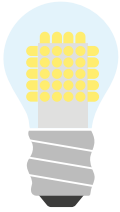


FLUORESCENT LIGHT BULBS



LED LIGHT BULBS



INCANDESCENT LIGHT BULB	FLUORESCENT LIGHT BULB	LED LIGHT BULB
		
36 light bulbs, 60W each Cost of light bulbs: €18	12 light bulbs, 14W each Cost of light bulbs: €24	6 light bulbs, 10W each Cost of light bulbs: €30
80€ year / 800€ in 10 years*	**18€ year / 180€ in 10 years***	**14€ year / 140€ in 10 years***

As can be seen from the infographic, the choice of one technology over another can result in huge cost differences in the medium term. This means that it is cost-effective to replace even new and working incandescent light bulbs. We can go from €14 a year for a LED light bulb to €80 a year for incandescent bulbs. A difference of no less than €66!

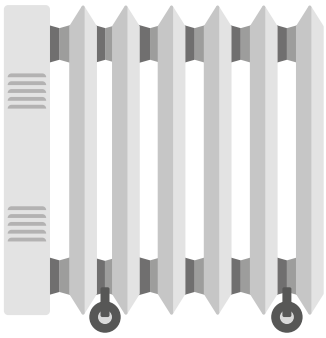
← Buying LED lights bulbs to replace incandescent bulbs is a profitable investment that will pay for itself in less than a year.

* We always consider a kWh cost of €0.21 and an average use of 3 hours a day.
The approximate level of illumination is 5.000 lm.

5. TRADITIONAL ELECTRIC HEATERS

Electric heaters are very cheap and simple appliances: electricity passes through a resistance element and converts to heat, which is circulated through a fan or a liquid. They are portable **fallback electrical appliances** that can be useful in case of unexpected cold weather as they raise the temperature in a room quickly. Unfortunately they consume a great deal of energy, significantly more than a methane gas boiler or a heat pump air-conditioner.

An electric heater can consume up to 2.000 watt/hour. This means an electricity bill of 42 cents an hour, a "low" cost when used for a few hours, but a significant one if used more frequently or if the heater is used instead of the methane gas boiler. **Keeping a heater on one hour a day costs about €13 a month**. If, on the other hand, we replace a heating system with an electric heater in every room throughout the five winter months, the cost can reach up to €1400 a year.



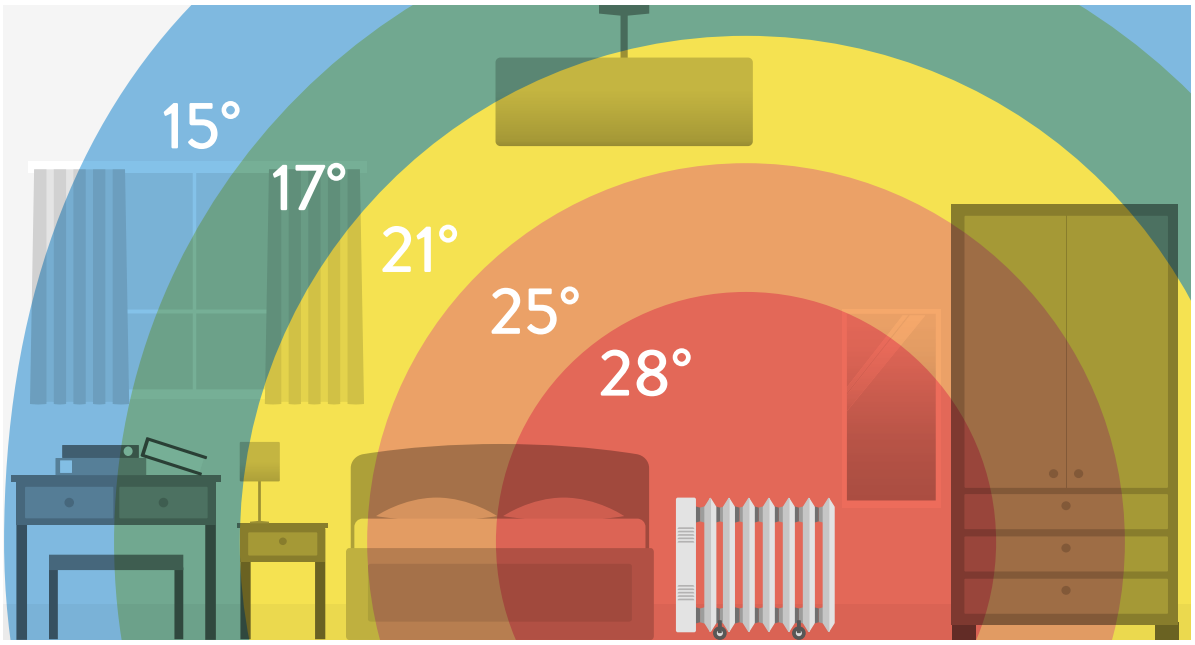
The result? Patchy heating, very poor indoor comfort and high electricity bills.

WHY ARE ELECTRIC HEATERS TO BE AVOIDED AT ALL COSTS?

- double the cost of a methane gas boiler and radiators
- instantaneous power consumption higher than the standard 3 kwh (in the example it is 8 kwh)
- production of unhealthy air
- non-uniform heating

The figure below helps to gain a better understanding of the issue of uniformity and quality of heating. The temperature near the heater is extremely high (28-30 degrees C), while just a few metres away it is so low (15 degrees) as to require putting on a scarf and heavy clothes.

← Using the electric heater to "save" methane is inadvisable, both from a financial point of view and as concerns **thermo-hygrometric well-being**. See the chapter "*Comfort is an investment*" p. 30.



We recommend the use of the portable electric heater in small rooms and only for a limited amount of time, for example in order to warm up the bathroom for about 30 minutes before taking a shower.
Any other use is inefficient, uncomfortable and very expensive.

6. CLASS A (A+, A++, A+++) DOMESTIC APPLIANCES

The purchase of new domestic appliances means considering the initial cost, but it would also be advisable to examine their "lifecycle" cost, as it can turn out to be far higher than what we pay out at the start. To see what we mean, just consider the long-term cost of the incandescent light bulb. By law, all domestic appliances are classified according to consumption. This simplifies our choice: we just need to look at the product specifications and calculate how much we intend to use the appliance in order to work out how much we can save in a year. It's particularly important to analyse the performance of those domestic appliances that are always on, like fridges and freezers, and of the appliances that we will use a lot, like the dishwasher and the washing machine. At times it would turn out to be more convenient to buy a class A++ appliance rather than the "best one" on the market.

Let's suppose we need to buy a 300 litre fridge. Let's look at the consumption in classes A, A+, A++ e A+++, without considering the lower classes. Current legislation states that the fridge, in order to be included in class A, must consume a maximum of 344 kWh/year, 263 in class A+, 206 in class A++ and 138 in class A+++. In the 10 year lifespan of the fridge, this is what we will save:

FRIDGE CLASS	ANNUAL COST	SAVINGS IN CLASS "A"
A	72€	-
A+	55€	170€
A++	43€	290€
A+++	26€	460€

With this kind of information available, it becomes easy to calculate whether we should buy a class A, A+, A++ or even A+++. We just need to work out how much it costs to purchase the appliance and if the higher price is justified. For example, if the class A+++ fridge costs €250 more than the class A one, it is certainly worth the price difference as we will be saving €210.

7. ELECTRICITY CONSUMPTION: HOW MUCH DO WE SAVE?

Before moving on to the next chapter, about hot water consumption, here is a brief rundown of how much we could save by implementing all the small adjustments that we have discussed in this chapter.

The adjustments listed are zero-cost or almost zero-cost steps that yield significant results. Following all of the suggestions listed here will certainly lead to considerable financial and environmental advantages, but even just a few adjustments can result in concrete benefits.

- Power strip with switch for the TV system: €40/year
- Cutting off power supply when appliances are not in use: €60/year
- Replacing all old light bulbs with modern LED light bulbs: €65/year

Total savings: 760 kWh/year, equivalent to €165/year in savings

From the environmental point of view, the production of electricity results in the emission of 0.43kg CO_2 per kWh of household electricity consumption (ENEA guidelines). **Thanks to these initial adjustments, we can make a saving of 326kg CO_2, which is equivalent to the amount converted by about 20 medium-sized trees in a year**.

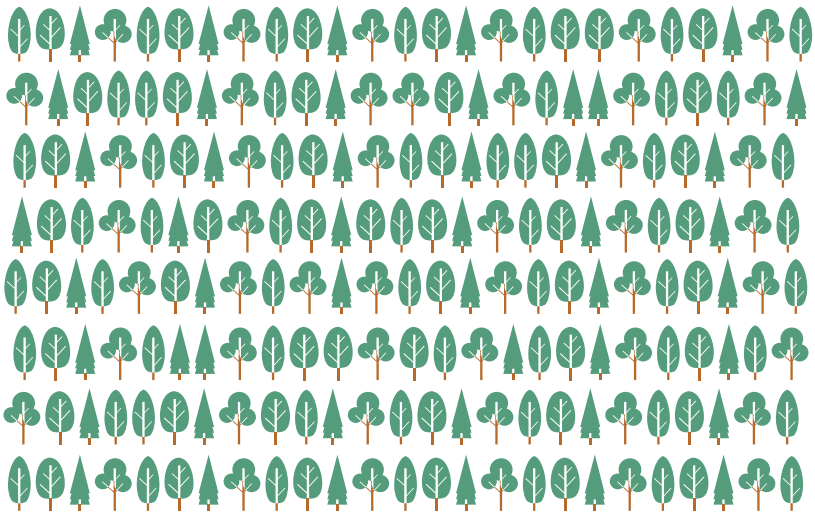
If 1.000 families made these adjustments, we could avoid an amount of emissions equivalent to that converted by 20.000 trees, practically a small wood.

← If we consider that a family of 3 spends an average of €650/year in electricity, the savings generated by these adjustments amount to 25% of their total expense.

Electricity savings 1.000 families

=

Clean air produced by 20.000 trees



A NEW APPROACH TO HOT WATER

Domestic hot water is a necessary expense and may seem like an area where we have no way of saving money. In reality, it can be managed responsibly. In this chapter we discuss how to optimize its management using a few concrete examples.

1. DOMESTIC HOT WATER, WHAT TEMPERATURE?

With a methane gas boiler, heating 1 litre of water by 1 degree C costs about 0.02 cents. This may seem a tiny amount of money, but if we consider that a family of two people, on average, heats about 20.000 litres of water in one year, it becomes immediately clear that the figure involved is far from insignificant.

To understand how we can save money by paying a little attention, we just need to calculate how much we spend to heat water with the boiler. Heating 20.000 litres of water to 40 degrees C brings the electricity bill to about €70, while we can spend over €100 to heat water to 60 degrees and bring it back down to 40 degrees by mixing it with cold water*.

In the second case we would be spending a lot more and with the same result of using 40-degree water. Quite an increase in our electricity bill!

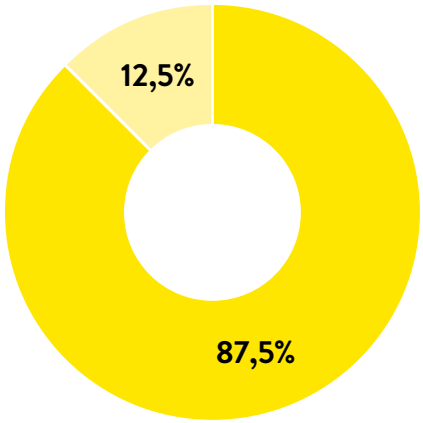
*Calculations done by empirically taking account of network yields and losses, assuming a gas cost of €0.85 per cubic metre.

IF WATER ALWAYS COMES OUT AT THE SAME TEMPERATURE, WHY THIS DIFFERENCE?
The higher the water temperature in the pipes, the greater the heat loss towards the walls of the house. This ratio rises more than proportionally until it reaches peaks of 30% dispersion in the most poorly insulated pipes. If to this we add the fact that the boiler is working harder to heat the water, with yields falling by 10-15% when the temperature is above 50 degrees, then we have our answer.

Heating the water and then cooling it to make it usable is not efficient. Particularly **in summer, when nobody wants very hot water, lowering the water temperature to 40° is an excellent way to save money!** In the winter, when it's colder and people want warmer water, you can set the water temperature to 45° and still get quite big savings on your bills.

«Would you set the temperature of domestic hot water to 40-45° to save on your electricity bill?»

87.5% of the respondents stated they were willing to try and assess the financial benefits.



Yes No

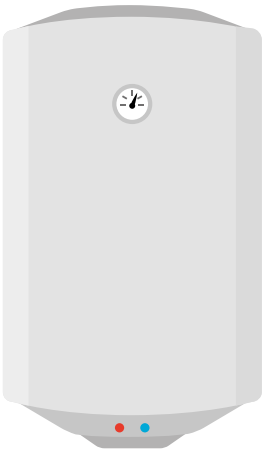
2. THE MOST COMMON SOLUTIONS: PROS AND CONS

Let's now examine three of the currently most common technologies used for heating domestic water:

- methane gas boiler, often used in independent heating systems
- standard electric resistance water heater, recognisable from its cylindrical shape
- heat pump water heater, the most recent but already very popular technology

METHANE GAS BOILER

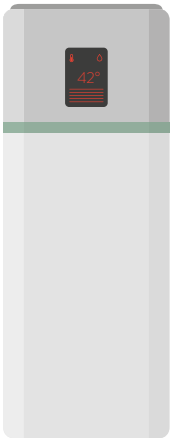
The methane gas boiler is the most common choice for those with an independent system as it is normally used for home heating. By law, they must be inspected every two years. Although they have an average-good performance, at times they can be located far from the utilities that require hot water (showers, bathroom fixtures, kitchen, etc), or outdoors. In these cases there can be heat loss from the pipes between the boiler and the end point of use. Since it serves both as the heating and the water heating system, it may not manage to keep the house sufficiently warm.



ELECTRIC RESISTANCE WATER HEATER

The traditional electric resistance water heater is affordable, costing just over €100, it is easy to install and takes a short time to bring the water to the right temperature. In addition, it can be installed near the end point of use, avoiding heat loss from the pipes.

On the other hand, its running cost is high. To this must be added the poor insulation of the water trunk, often smaller than 3cm, and the **instantaneous power consumption**, which can make the main trip switch turn off when other domestic appliances are running at the same time (dishwasher, washing machine, oven, etc).



THE HEAT PUMP WATER HEATER

The heat pump water heater delivers excellent performance and has low instantaneous power consumption. It can be installed as easily as a boiler but is better insulated. On the other hand, it has a high initial cost, close to €1.000, which however can be softened by taking advantage of the national incentives of **Conto Termico 2.0** and **Tax deductions**.

As it is a low-consumption appliance, it takes a few hours to heat the water and therefore must be kept running all the time. If needed, it can work as an electric resistance water heater, heating the water more quickly and increasing consumption. Therefore, in order not to lose the financial benefit, it is recommended not to use it at a temperature higher than 55 degrees.

THE COSTS OF THE DIFFERENT TECHNOLOGIES

Below we can see how to save money by choosing the right technology. Especially in the case of the heat pump water heater, the initial cost is rather high and we need to work out whether the investment will pay for itself. The question we all ask ourselves in these cases is: *"Is it value for money?"*.

While the condensing boiler has almost zero initial cost, as it comes with the house, in the case of the electric water heater and the heat pump water heater one has to consider the purchase cost.

As shown in the example at the beginning of this section, using the methane gas boiler we would spend €70 to heat 20.000 litres of water to 40 degrees. With the electric water heater we would spend €100 and with the heat pump water heater only €30.

The heat pump water heater can therefore deliver savings of 65-70% in comparison to the electric resistance water heater, and of about 50% in comparison to the methane gas boilers. In the end, net of the initial investment, **annual savings will amount to €70**.

System type	Initial cost	Maintenance	Tax deduction	Annual cost [water at 40°]	Total expenditure after 10 years	Annual cost [water at 60°]	Total expenditure after 10 years
Methane gas boiler (already in the home)	-	15€	-	70€	850€	100€	1.150€
Electric resistance water heater (80 litres)	150€	-	-	100€	1.150€	150€	1.650€
Heat Pump Water Heater (80 litres)	900€	-	50%	30€	750€	60€	1.050€

Although the initial investment for the heat pump water heater is much higher, the very small annual cost and possible incentives make it extremely competitive and convenient, the best value for money of all the systems. Please note that the figures in the table are based on the consumption of a family of two people. In a family of four people, the savings in comparison to an electric resistance water heater would be double.

I HAVE AN ELECTRIC RESISTANCE WATER HEATER OR A METHANE GAS BOILER. SHOULD I CONSIDER REPLACING IT?

If you are using a methane gas boiler for domestic hot water, it is recommended that you make a further investment only if it is struggling to heat the home or if you use the shower a lot. For immediate savings, you can lower the **set-point temperature** and save quite a bit of money at zero cost. If you cannot get hot water with a lower set-point temperature, for example because of heat losses, you can always turn the thermostat up again.

If you use an **electric resistance water heater** to heat water, even if only to take a shower, it is recommended that you consider replacing it with a pump water heater, especially if you can deduct the cost. The savings amount to €400 in 10 years and grow further with every year of use. If you prefer not to replace the water heater, it is recommended you set the water temperature at 40-45 degrees, so as to start saving a little right away.

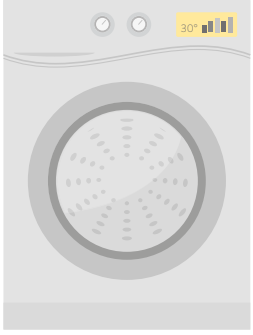
The electric resistance water heater is inexpensive but inefficient. It makes sense to use it in a house that is inhabited only occasionally or where it is used just to cook or wash the dishes, but when used daily for all purposes it leads to considerable expense. Besides, the above data does not take into account the fact that if the water heater is old it could also be in a poor state of repair or have limescale build up and therefore be operating much more poorly than is assumed here.

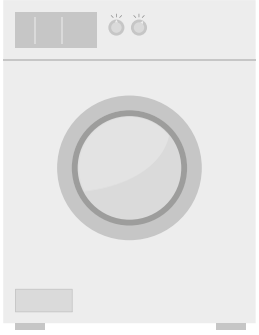
3. THE WASHING MACHINE, WHAT AN INEFFICIENT WATER HEATER!

The washing machine is an indispensable appliance in our homes. However, not everybody knows that it can have the same financial advantages and disadvantages as the water heater, depending on the washing temperature selected. The water is heated with the same system used by the electric boiler, a very inefficient system that consumes almost twice as much energy as a methane gas boiler to heat the water.

First of all, we can consider if and when it makes sense to buy a new washing machine that is better in terms of washing quality and much more convenient as regards water and therefore electricity consumption.

An obsolete washing machines heats and consumes 100 litres of water for each load, enough to take 3 showers. Modern washing machines, which heat and consume a maximum of 50-60 litres of water per load, are a significant source of savings even just because of the amount of water they heat.





Using an obsolete washing machine costs **€120** for 100 loads/year, or two loads a week, while with a modern washing machine the cost is **€60** for the same number of loads. Saving €60 a year means the **€400 washing machine pays for itself in 8 years** - and this for a silent washing machine with a good spin cycle and under warranty. **If used once a day, the €400 washing machine will pay for itself in just 3 years**. If we need to buy a washing machine, let's take these figures into consideration.

Replacing a class B or lower washing machine with a modern class A+++ one is a profitable financial investment. If we are still happy with our washing machine and don't want to replace it, we can still save a lot by choosing the lowest possible temperature setting for the type of wash we need to do.

We have calculated the costs of 3 types of washing, at 30, 40 and 60 degrees. In the calculations shown below we have considered a medium-sized washing machine that heats 80 litres of water per load, but we have not included the cost of the water and electricity needed to operate the washing machine. At 60 degrees we spend 80 cents. It doesn't seem like much, but if we consider the annual cost the figure becomes more significant.

WASHING AT
30°

94 kWh/year
€20/year
20 cents per load

WASHING AT
40°

190 kWh/year
€42/year
40 cents per load

WASHING AT
60°

400 kWh/year
€84/year
80 cents a washing

With only two loads a week, expenditures increases from €20/year washing at 30 degrees to €84/year washing at 60 degrees. If we do 4 or 5 loads a week the cost would rise considerably.

When doing the laundry, therefore, it's very important to pay attention to the temperature: simply by washing at a temperature lower than 60° whenever possible we can save at least €40 a year. If we use cold water the savings double, reaching €60.

4. IN THE KITCHEN: INDUCTION, ELECTRIC RESISTANCE OR GAS STOVE?

Methane gas or electricity can be used for cooking food. In recent years, with the spread of affordable **induction** technology, the use of electricity is becoming more popular.

← Before the advent of the induction plate many used the electric plate, still very common in Germany, which is similar in appearance but less energy efficient.

The question now is how energy efficient and convenient is induction technology. To answer it, we can turn to the results of a test done by a user of the *cercaenergia* forum to assess the actual pros and cons of the technologies mentioned above.

The test involves heating a litre of water from 20° to 100°, up to boiling point, using the three different technologies. It takes about 80 kcal (one kilocalorie for each degree of temperature) to reach this temperature.

If we transform the kilocalories to watt hours, we obtain about 93 watt hours.

INDUCTION PLATE (800W)
- it took 7 minutes
- it consumed about 93 watt hours with an efficiency percentage of almost 100%

ELECTRIC PLATE (1.000W)
- it took 11 minutes
- it consumed about 183 watt hours with an efficiency percentage of 58.8%

GAS STOVETOP (1.400 theoretical Watts)
- it took 9 minutes
- it consumed about 210 watt hours with an efficiency percentage of 44.3%

Let's take as an example a family that doesn't eat lunch at home during the week and heats water to cook food on average once a day and a couple of times at the weekend. By using the electric plate this family would spend €58 a week, while it would spend €30 both with the induction plate and the gas stove.

This test confirms that the induction plate is cost-competitive in relation to the gas stove, in addition to offering the great advantage of taking 20% less time. As for watt hours, induction consumes half the energy used by its competitors. It's easy to see where gas and electric resistance "waste" energy: just touch the handles of the pot on the stove and you will soon feel them getting very hot.

Regarding the cost-effectiveness of the purchase, gas costs about half as much as electricity with the same number of watt hours, therefore even if consumption were to double the gas bill would be more or less the same as that for the induction plate.

It will certainly never be cost-effective to buy an electric plate since it consumes twice as much energy as the induction plate, in addition to heating more slowly than the alternative methods. Therefore we need to assess on a case by case basis how cost-effective one technology is compared to another.

A good gas stove costs over €200, compared to €350 for a good induction plate. Taking into account the fact that when purchasing an electric stovetop one can take advantage of the **bonus mobili**, with 50% deduction, the cost difference between the two stovetops becomes minimal.

INDUCTION PLATE
- Consumption: 140 kWh/year
- Cost: €30/year
- Cooking hours: 60 hours/year

ELECTRIC PLATE
- Consumption: 275 kWh/year
- Cost: €58/year
- Cooking hours: 90 hours/year

GAS STOVETOP
- Consumption: 315 kWh/year
- Cost: €32/year
- Cooking hours: 75 hours/year

WHEN SHOULD WE MOVE TO AN INDUCTION STOVETOP? WHICH FACTORS SHOULD WE CONSIDER?

- *Time* – A 20% saving compared to gas
- *Cleanliness* – Smooth and waterproof surface, easy to clean
- *Appearance* – Modern line that mirrors current trends
- *Safety* – No gas escape or loss of flame. It only heats on contact with pots o pans

WHICH FACTORS COULD LEAD US TO CHOOSE A GAS STOVETOP?

- *Electricity* – no electrical overload problems because it uses gas
- *Pots and pans* – no specific pots and pans are needed

5. THE LID, HOW MUCH DOES IT COST TO DO WITHOUT IT?

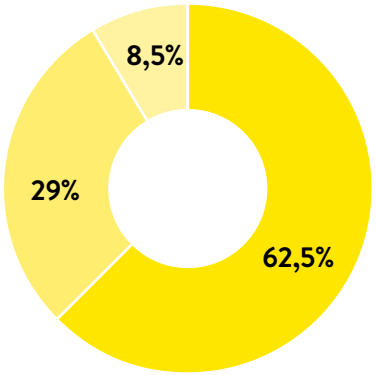
Heating water to cook pasta the right way can be an excellent example of how to save both energy and time.

Using the lid greatly speeds up water boiling and therefore has a significant impact on energy efficiency. Another factor not to be overlooked is the production of water vapour, one of the main causes of indoor humidity and mold in the home.

Using the lid brings considerable advantages: **20% time and gas (or electricity) savings and production of 60% less water vapour.** Let's not forget it!

«When you heat water, do you use a lid?»

The feedback was rather positive, as 60% of respondents stated that they regularly put a lid on pots.



Yes, always **Sometimes** **No, never**

The chemist Dario Bressanini in his blog presented a test on the use of the lid: bringing 4 litres of water to boiling point took 6 minutes more when not using a lid.

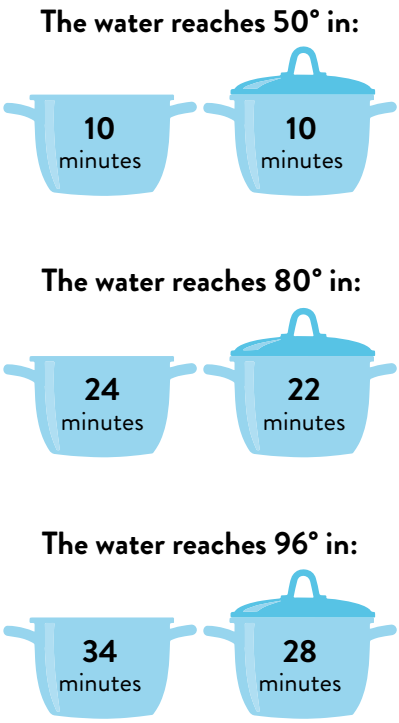
This data can change depending on the kind of stovetop and pot, but we can take the results as generally valid.

The infographic on the side displays the effects of using or not using the lid, based on his analysis. As you can see, no saving can be seen below 60°, it starts to increase at 80° and becomes much more significant as the last 20 degrees are heated, because of the strong heat losses.

We achieve 20% energy savings which, taking into consideration the costs examined in the previous chapter, amount to a saving of 3 cents for each single use on the stovetop. Each use will cost us:

- 13.7 cents with the lid on
- 16.7 cents without a lid

By boiling water with the lid on 500 times a year, that is, little more than once a day, **we would save €15**. Considering also the time savings, no less than 50 hours a year, it really makes sense to turn this simple and efficient practice into a daily habit.



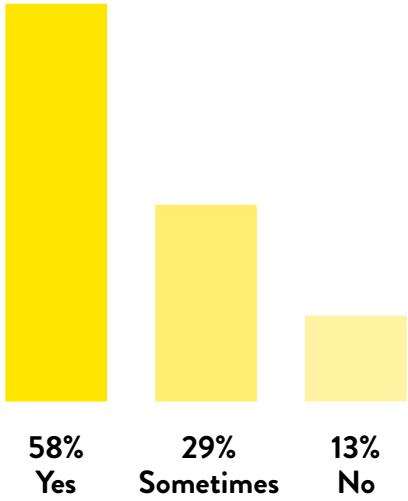
6. THE WATER BILL: BRUSHING YOUR TEETH

When brushing your teeth, turning off the water after wetting the toothbrush is a good habit to get into. Leaving the tap running while brushing your teeth wastes five litres of water a minute.

This means wasting no less than 30 litres of water a day, or 10.000 litres a year. Aside from the environmental consequences, which are much more important than the financial ones, **we are wasting about €50 a year** just for not turning off the tap when we brush our teeth.

«When brushing your teeth, do you turn off the water?»

Only 13% of respondents leave the tap running, while 30% state that they only occasionally forget to turn it off. This is not a negative finding, but more should be done to spread the practice of turning off the water to 100% of the respondents.



7. THE WATER BILL: THE TOILET TANK

Not all toilet tanks are the same. Some traditional tanks can use more than 10 litres of water in one flush, while the more modern and efficient ones use about 6 litres.

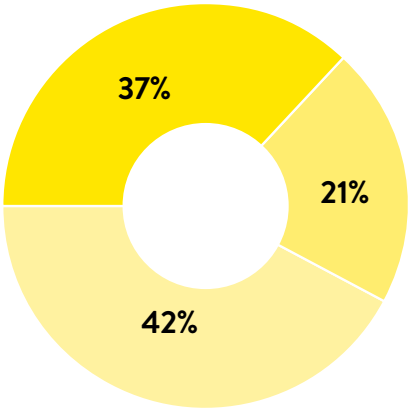
The flush buttons are also very important for saving water, as it's not always necessary to flush the whole tank. In cost-effective terms, up to 15.000 litres/a year per person can be wasted through the toilet tank, an amount which could be reduced to 6.000 litres/year with the right toilet tank system, **resulting in savings of about €50-60 per person**.

Traditional toilet cisterns: Since it's not possible to install flushing water controls, other strategies can be used to reduce the amount of water in the cistern. By inserting two small water bottles full of sand, taking care that they don't interfere with the flushing mechanism, we could use less water with **savings of €6-8 a year per person**.

Wall mounted toilet tanks: a flush button can be installed, which makes it possible to regulate the amount of water to be used according to need - a convenient system that results in great savings. The buttons can be either dual-flush or start&stop.

«Have you installed a toilet flush button?»

Only 40% of respondents have a toilet flush button. This number is far too small considering the impact this device can have on the environment.



Yes Sometimes No

8. WATER AND HEAT: HOW MUCH DO WE SAVE?

Before moving on to the next chapter, about indoor comfort, here is a brief rundown of how much we could save through the suggested measures for the management of water and the costs of heating it.

We have seen that some measures require almost no initial cost; others, like the washing machine or the pump water heater, do have an initial cost. To maximize your savings, it is recommended you take into consideration our suggestions for replacements when the time comes to replace your appliance.

ZERO-COST SAVINGS:

- Lowering the temperature of hot domestic water: €30/year
- Paying attention to the washing temperature: €60/year
- Put the lid on when boiling water: €15/year

SAVINGS INVOLVING INITIAL INVESTMENT:

- Replacing the electric resistance water heater with a pump water heater: €70/year
- Replacing your washing machine with a class A+++ washing machine: €60/year

TOTAL SAVINGS:

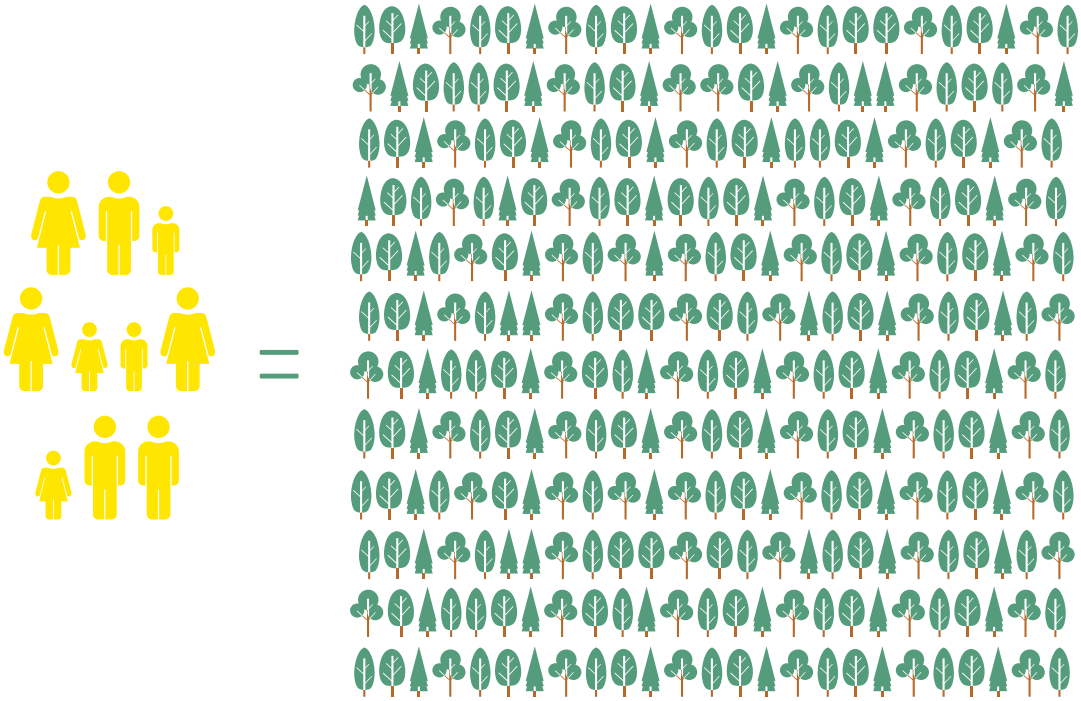
1200 kWh/year, equivalent to 245€/year in savings

From an environmental point of view, involving emission levels from gas consumption and from electricity consumption, **we can make a saving of 468 kg CO_2, which is equivalent to the amount converted by about 30 medium-sized trees in a year**.

If 1.000 new families would put what we have been suggesting into practice, we could achieve emission savings equivalent to the amount converted by no less than 30.000 trees in a year. **To be clear, enough trees to fill a wood 4 times the size of the Margherita Gardens in Bologna**.

Hot water not wasted by 1.000 families

Clean air produced by 30.000 trees



COMFORT IS AN INVESTMENT

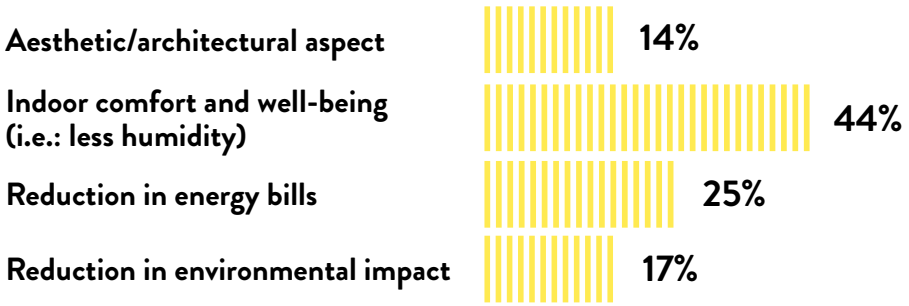
The last section of the manual focuses on indoor home comfort, from air quality to cold spots and draughts. Home is where we spend a great deal of our lives and we want it to be comfortable.

1. THE IMPORTANCE OF COMFORT AND WELL-BEING

The first thing we notice entering our homes is the air temperature. Achieving an indoor temperature that is as uniform as possible means making the most of the thermal energy produced by the boiler, getting sick less often and preventing condensation and mold from forming. The benefits, as one can well imagine, are many: the financial return from optimal management of the boiler, our own well-being due to indoor comfort and the absence of unhealthy substances in the air.

«Of the following aspects, which one is the most important to you?»

Though cost savings are very important to tenants, almost 45% of them **put indoor comfort and well-being first**, a sign that home quality of life is not a secondary aspect.



2. THERMOSTATIC VALVES - YOUR TEMPERATURE IN EVERY ROOM

Through the installation of **thermostatic valves on radiators**, the flow of hot water can be automatically controlled according to the temperature set by the user. These valves are meant to replace the manual valves on the radiators. It's an important energy efficiency innovation that reduces waste. The valves make it possible to set the **optimal temperature in each room**, thus solving problems due to different temperatures in the various rooms, and increasing the level of indoor home comfort.

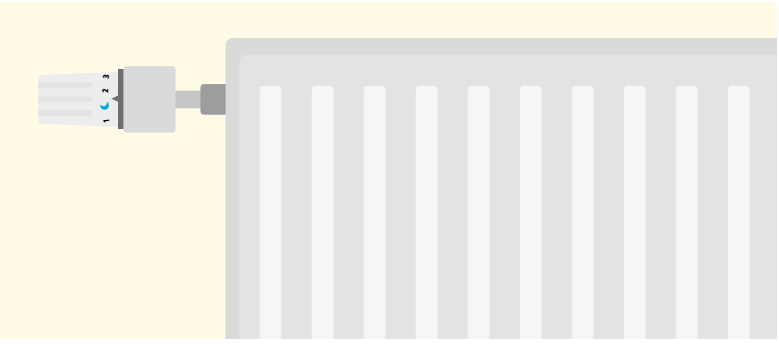
Also, the temperature can be changed according to need. You can experiment with indoor comfort whenever you wish by turning the valve down to lower the temperature and up to increase it.

Once set, the thermostatic valve manages the radiator automatically, turning it on and off according to the temperature to be reached. All you have to do is set it at the desired temperature. It's very important not to interfere with the controls when the radiator turns off. That is precisely the time when the most savings are made.

Their cost ranges from €10, for the simpler ones, to €20 for valves with LED thermostat. They are installed without removing or changing the radiators, with the help of a technician who can give advice and avoid problems, such as small water losses, that may occur from incorrect assembly. With the right setting, home savings can reach over €150 a year, with the **investment paying for itself** in 1 year, just one winter season.

← According to experimental studies carried out by ENEA, the Italian National Agency for Energy Efficiency, thermostatic valves provide better thermal balance in the whole building, leading to savings of 15-20% on the energy bill.

Another factor to take into account is that the **optimal bedroom temperature is 1-2 degrees lower than that in the living room**. This is because the body needs to feel a drop in temperature in order to get ready for sleep. A study reported in the Wall Street Journal states that the ideal temperature for a good night's sleep is between 16 and 19 degrees, and ideally 18. In his study, Dr. Walker found that sleeping in a room that is too hot prevents the brain from passing correctly from a state of wakefulness to sleep, with negative impacts on the quality of sleep. Using the valves we can customize the temperature to our needs.



3. AMBIENT THERMOSTAT AND CHRONOTHERMOSTAT

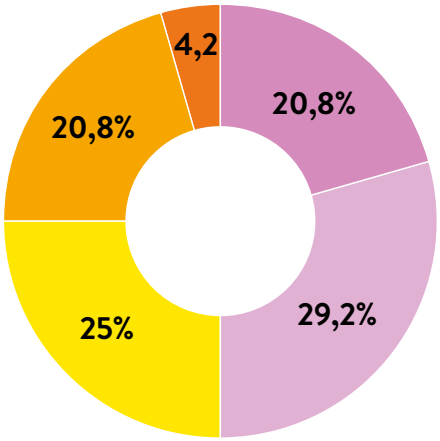
The ambient thermostat is a device connected to the boiler that monitors changes in the home temperature and easily controls it by turning the boiler on and off, based on our setting. It's an extremely useful device for managing indoor well-being, energy consumption and therefore bills.

Indoor temperature control based on our needs, combined with correct regulation by the thermostatic valves in the different rooms, leads to savings of **hundreds of euros a year**.

The ideal average home temperature in the home is between 18 and 20 degrees. 18 degrees is the lower limit below which one starts feeling cold and environmental health cannot be maintained (see chapter "why condensation and mold form"). 20 degrees, on the other hand, is a good temperature, the upper limit beyond which energy bills increase significantly.

«What temperature do you set your heating to at home?»

The average temperature set by tenants is often a little too high, above 20 degrees, resulting in an increase in gas consumption for heating.

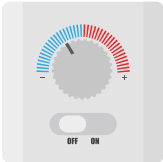


19° 20° 21° 22° 23°

There are different types of thermostats on the market, from the simpler, manual versions to the smarter, automatic ones:

ON/OFF THERMOSTAT

It can be found at prices ranging from €10 to €30, a very inexpensive investment that is very useful for setting the right temperature. One of the main disadvantages of this thermostat is that it's not possible to set two different temperatures, a daytime one and a night time one.



AMBIENT CHRONOTHERMOSTAT

Costing from €25 to €60, this device makes it possible to set two different temperatures at different times, and therefore to save during those hours when less heat is needed, that is, at night and when at work. It is recommended that there is never a difference of more than 1-2 degrees between the two temperatures in order not to strain the boiler when it fires up again and avoid the risk of condensation. The more expensive models have an integrated **hygrometer** that displays that humidity percentage in the house.

SMART CHRONOTHERMOSTAT

Prices range from €70 up to more than €200 for the best performing and most renowned models. It can be controlled via the cell phone, making it possible to save more than with other types. The rather high cost can be viewed as an investment, considering all the functions it provides. The more expensive models can control everything automatically, making life easier at home, keeping track of energy consumption and helping to fight problems such as mold.

WHAT WHAT SHOULD WE KEEP IN MIND IN ORDER TO USE THE THERMOSTAT PROPERLY?

Take care where you place the thermostat in your house. Often it's in spots where it's very hot or where there may be a draft (the corridors). In these cases the detected temperature won't be the same as in our rooms, therefore it's recommended to check the temperature in the rooms with a thermometer and adjust the thermostat temperature accordingly.
Programming the "daytime" temperature for one hour before you wake up is an excellent way to save if you own a chronothermostat. This way you will save energy at night and the boiler will still heat the house by the time you get up. Similarly, you can set the "night time" temperature half an hour before going to bed, as the house won't cool down in that time and the boiler will rest a bit. If you are going out to work and there's no-one at home, you should do the same before leaving.

4. AIR QUALITY

This chapter does not discuss visible savings on your energy bills but rather **how to increase well-being by achieving the right balance between heat, humidity and ventilation**.

This may be thought of as indirect savings when we consider the maintenance costs we avoid by preventing mold stains in the corners or walls peeling due to absorption of water. However, the greatest and most important savings are in terms of health benefits, as a healthy, mold-free environment reduces the risk of colds, bronchitis and respiratory allergies.

Two people produce almost 1 litre of water vapor in 4 hours and no less than 200 litres of CO2, which must be diluted by outdoor air. Water vapor causes problems in the house, while CO2 is harmful to health. As 70% of respiratory diseases are caught inside the home and are caused by mold and polluting substances, it is clear that ventilating or airing rooms is a fundamental requirement.

Air quality is very important for the well-being of those living in the house and for the health of the building itself. The temperature difference between the walls and indoor air, or excessive indoor humidity, can lead to surface condensation and the formation of mold, which is very unsightly as well as unhealthy for those living in the home.

Mold releases polluting substances such as mycotoxins, some of which have a strong irritant and carcinogenic effect on the lungs. Several investigations of buildings in which health or comfort problems have been reported found that the main cause in almost half of the cases was inadequate ventilation, which causes an increase in the concentration of airborne particles, toxins, chemicals etc. (source: www.salute.gov.it).

5. VENTILATION: YES, BUT WHEN?

Ventilation is one of the main causes of thermal loss but also the way to avoid the formation of condensation and mold. In addition to increasing heating costs by 25%, excessive ventilation can cause an increase in condensation and therefore in mold formation. On the other hand, a lack of ventilation prevents excess humidity produced by people and in the air from exiting, therefore causing an increase in water vapor and leading to condensation and mold (source: www.archimedegroup.eu).

HOW DO CONDENSATION AND MOLD FORM?

The humidity that allows the formation of mold is generated because the air, depending on the temperature, can contain a certain amount of water vapor, which decreases as the temperature decreases. For example, with a temperature of 5 degrees and a relative humidity of 90%, there are 6 grams of water vapor per cubic meter of air, while with 25 degrees and a relative humidity of 50%, there are no less than 12 grams of water vapor per cubic meter of air, twice as much. Therefore, if the temperature is lower in a certain part of the house, that's where condensation will form.

The humidity that is formed by breathing, cooking, showering and drying wet laundry in the house settles on the walls, forming condensation in the colder spots, usually on the windows and in the corners. This leads to the formation of mold, which tends to develop at a temperature below 17° and a relative humidity above 80%. **Every person produces on average 2kg of water vapor a day**, while an uncovered boiling pot of water produces about 0.5kg of water vapor each time.

Therefore not opening windows enough, especially if they are well insulated, will create a humid environment at home that is subject to mold growth and with a higher than standard CO_2 concentration: the so-called consumed air.

On the other hand, keeping the windows open for too long, especially in winter, can have unwanted effects similar to those caused by not opening them enough, in addition to increases in heating bills. **Winter air is very good for the indoor environment, as it contains an extremely low level of humidity, even when it rains**.

← Leaving a window open all day or all night while the heating is on wastes enough energy to travel by car from Milan to Bergamo. (Source: *UNESCO)*

We need, however, to prevent outdoor air from lowering the temperature in the home, in order not to lower the condensation threshold: when air is colder it holds less humidity and this causes it to condense. Ice cold beer is an example of this phenomenon: the bottle is dry in the fridge, but when we take it out it starts "sweating" and we see water droplets forming on its surface.

These droplets are due to the air that, coming into contact with the glass, cools down and loses the ability to hold the humidity it contains. We should avoid keeping windows open for too long when it's very warm, as warm air holds a lot of humidity and releases it when it enters a cooler environment, like a home.

WE SHOULD VENTILATE OUR HOMES DIFFERENTLY DEPENDING ON THE SEASON OF THE YEAR. HOW SHALL WE GO ABOUT IT?

Summer: as the outdoor air is warm and full of humidity, the ideal situation is to air the house only during the cool hours, in the morning and in the evening, or when it's windy outside, keeping the windows closed and shaded the rest of the day.

Winter: as the outdoor air is cold, it's better not to leave the windows open for long to avoid the house getting cold. At the same time, it's important to air the house every day, even in bad weather, to prevent the formation of mold. Ideally we should open the windows for 2-3 minutes more than once a day, in the warmer hours, to change the air and remove the water vapor produced by people and daily activities.

We must be careful not to get too near the condensation point so as to avoid the risk of the "ice cold beer" effect described above.
The ideal relative humidity level is between 40 and 65%. This humidity level is also the ideal one for our physical well-being.

By keeping the temperature above 17 degrees, ideally between 18 and 20, and opening the windows at the right time, we can avoid mold problems, keeping below the condensation point and above the conditions for mold.

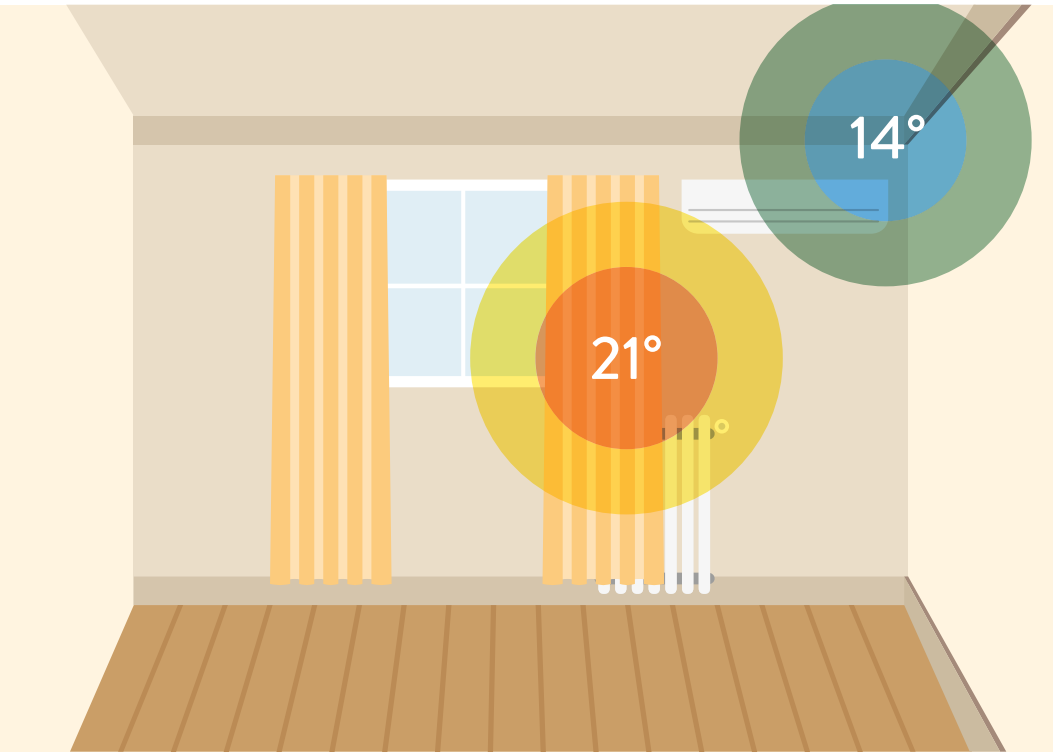
IDEAL CONDITION WINTER	CONDITIONS FOR MOLD	IDEAL CONDITION SUMMER
Temperature: 17-21°C Humidity: 30-70%	Temperature: 10-17°C Humidity: 80-100%	Temperature: 24-28°C Humidity: 30-50%

6. CORNERS AND THE FORMATION OF MOLD

The ideal environment for mold is humid and with a temperature below 17° C. For example: in a room with a radiator under the window and an air conditioner in the corner near the same window there can be a significant temperature difference between the warmest spot (the radiator) and the coolest one (the corner). This causes the formation of mold as the temperature drops from over 22 degrees to about 14 degrees.

Let's try to figure out together what mistakes were made and why this is a classic example of inefficient home management:

- A curtain was placed above the radiator and absorbs all the heat, preventing it from moving towards the cold spot.
- The position of the air conditioner prevents the circulation of warm air from the centre of the room towards the corner.



Where there are cold areas in the corners of rooms, it is useful to buy a hygrometer to place near the cold spots. This instrument, which costs only €15-20, can let us know how well we are addressing the humidity problem by showing us when the humidity level is above 80%. This way we will know that we need to air the room immediately, before condensation forms in the corners.

← **Thermography**, the professional tool used to detect thermal defects in home, makes it possible to see the cool and warm spots in the home and also to establish the causes of their formation.

WHAT COULD WE DO TO SOLVE THE PROBLEM REPORTED ABOVE?

- Move the curtain so that it doesn't cover the radiator or use a shorter one, so that the air can circulate.
- Avoid obstructions such as furniture and air conditioners blocking air flow towards certain corners of the room.
- Air the home properly, as described in the previous chapters, to reduce the absolute humidity level indoors.

If there are any unused rooms, we should not leave them completely cold. Cold walls in contact with heated rooms are likely to generate surface condensation with consequent formation of mold.

7. DRAUGHTS: WINDOWS, DOORS AND ROLLING SHUTTER BOXES

Something to watch out for are cracks in doors and windows through which cold air can enter. These draughts can be caused by damaged gaskets or by defects in the opening frame.

Another element that needs to be checked out, as it can let cold air into the house, is the roller shutter box. Its drawback is that it creates a bridge between the house and the outside through which cold air can enter. It is always recommended to insulate the inside of the rolling shutter box, an inexpensive measure. There is all the more reason to do it when, in addition to the cold air, there is also a draught. In this case it is advisable to take steps to reduce heating costs.

WINDOWS

Many self-adhesive gaskets on the market help to overcome the problem of draughts inexpensively. You just need to make sure to clean the surface well and cut and position the gasket precisely.

DOORS

There are draft excluders on the market made specifically for doors - they cost €12-15 and must be installed according to the manufacturer's instructions. They are very effective but need to be replaced after a few years.

ROLLING SHUTTER BOXES

They can be insulated by inserting a flexible panel made specifically for shutter boxes, or by lining the inside of the shutter box with a layer of soft rock wool. This is an easy and affordable solution but it is advisable to contact an expert technician, as there is the risk of not having enough space for the insulation, of insulating poorly against draughts or, worse, of blocking the rolling shutter with the insulating material.

DECALOGUE OF RESPONSIBLE MANAGEMENT

- Electricity or gas consumption savings
- Water consumption savings
- Greater indoor comfort
- Time savings

DAILY ACTIVITY	ADVANTAGES
1. Use a socket with switch for your domestic appliances	
2. Turn off all the lights when leaving a room	
3. Don't use the traditional electric heater to heat the house	
4. Lower the temperature of hot domestic water	
5. Use the washing machine at a lower temperature	
6. Remember to use a lid when boiling water	
7. Turn off the water when brushing your teeth	
8. Open the windows several times a day and for just a few minutes	
9. Remove obstructions from radiators and corners of the house	
10. Get rid of draughts from windows and doors	

NOW, OVER TO THE TENANTS

THE QUESTIONNAIRE

ASTER, with the support of ACER Reggio Emilia and the University of Bologna, has developed a questionnaire for tenants, to help us understand whether we are managing our homes efficiently or whether we can do something more. The questionnaire is divided into two parts: the first concerns energy saving habits, the second one the home and the relationship with neighbours, the agency and the municipality. Our answers can provide ACER and the region's municipality with useful information for understanding what instruments to give tenants so they can save and enhance their well-being. Therefore it's important to answer carefully, reflecting on the practices, both virtuous and incorrect, that we use without even realizing it.

If you haven't done so already, please fill out the questionnaire, cut it out and hand it to your ACER operator. You will be helping the agency to provide a better service.

If you are not living in ACER accommodation, please fill in the questionnaire on the website **www.progettolemon.it** or through the QR CODE below: your contribution will help to establish cost saving models and provide a healthier, safer and more beautiful living environment.

← QR CODE
Now over to the tenants

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GOOD HABITS FOR SAVING MONEY: NOW OVER TO THE TENANTS

The questionnaire is anonymous, has 21 questions and takes only a few minutes to complete.

All questions refer to the winter period when the heating is on

1) How much do you care about save energy?
Only one answer

- ☐ A lot
- ☐ Somewhat
- ☐ A little
- ☐ Not at all

2) Is there a particular reason that drives you to reduce your energy consumption?
Only one answer

- ☐ It saves me money
- ☐ I am aware of its importance for the environment
- ☐ Setting a virtuous example
- ☐ I don't pay attention

3) Do you find it difficult to save energy?
Up to two answers

- ☐ Yes, I don't want to change my habits
- ☐ Yes, I can't control the temperature
- ☐ Yes, I don't really know how to do it
- ☐ I don't feel it's a priority
- ☐ I can't see an immediate financial gain
- ☐ I don't find it difficult

4) What are you willing to do?
Up to two answers

- ☐ Lower the temperature when I am not home or I am asleep
- ☐ Purchase a smart thermostat
- ☐ Dress more warmly and keep the temperature low
- ☐ Ask for an expert opinion
- ☐ Lower room temperature using thermostatic valves
- ☐ Nothing

5) Who is more concerned about energy saving?
Only one answer

- ☐ You
- ☐ Your partner
- ☐ Your children
- ☐ Your co-tenants
- ☐ No one

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6) What is the first thing you do if you are very cold?
Only one answer

- ☐ I raise the boiler temperature
- ☐ I put on another sweater
- ☐ I drink something hot
- ☐ I open the valves of the radiators (if there are any)

7) Take a typical day: how many hours does your family spend away from home?
Out of 24 hours in a day cross out the number of hours when no one is at home.

Dal lunedì al venerdì	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Nel weekend	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

8) Do you open the windows during the day? ☐ Yes, for a few minutes ☐ Yes, several times ☐ No

9) For what reasons?
Up to two answers

- ☐ To change the air in the morning
- ☐ To get rid of smells in the kitchen or in the bathroom
- ☐ To refresh the air before going to sleep
- ☐ I never open the windows

10) Is there a thermostat in the house?
Only one answer

- ☐ Yes, a timed one
- ☐ Yes, only on/off
- ☐ No, I would be interested
- ☐ No, I'm just fine

11) If you have one, was it programmed according to the number of people in the house?
Only one answer

- ☐ Yes, it saves me money
- ☐ No, I don't know how to program it
- ☐ No, I keep the same temperature

12) Do you have thermostatic valves on the radiators? ☐ Yes ☐ No

13) Have you thought about replacing all your light bulbs with LED ones?
Only one answer

- ☐ I've already done so!
- ☐ I am seriously thinking about it
- ☐ They still cost too much
- ☐ I don't handle the light bulbs

PARTNERS: ACER ACER parma

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14) Speaking of good practices, how are you doing with the following ones?
One answer for each question

When you heat water, do you use a lid?	☐ Yes, always	☐ Sometimes	☐ No, never
Do you turn off the lights when you leave a room?	☐ Yes, always	☐ Sometimes	☐ No, never
Do your taps have aerators?	☐ Yes	☐ Only some	☐ No
Have you installed a toilet flush button?	☐ Yes	☐ No, I would	☐ No, is it useful?
Do you turn off the water brushing your teeth?	☐ Yes, always	☐ If I remember	☐ No, never
Climbing just a few floors, do you take the stairs?	☐ Yes, always	☐ Sometimes	☐ No, never

15) What temperature do you set (or would set) your heating to at home?
Only one answer

☐ 19°C ☐ 20°C ☐ 21°C ☐ 22°C ☐ 23°C

16) What temperature do you set it (or would set it) to when you are NOT at home?
Only one answer

☐ 16°C ☐ 18°C ☐ 19°C ☐ 20°C ☐ 22°C

17) Who chooses the temperature of hot domestic water?
Only one answer

☐ I control it ☐ I don't know how to set it ☐ The apartment building sets it

18) What temperature is it set to? (by you or the apartment building)
Only one answer

☐ 40°C ☐ 45°C ☐ 50°C ☐ 55°C ☐ 60°C

19) Would you set it to 40-45°C to save (a lot) on your electricity bill? ☐ Yes ☐ No

20) Do you use any apps to control consumption and costs?
Up to two ansters

☐ I use an app to keep my energy bills under control.
☐ I would like an app to help control costs/consumption
☐ I use an app to control the temperature via my smartphone
☐ I'm not interested in apps/I don't have a smartphone

21) If you could choose, how would you like to receive information about your consumption and advice on how to reduce it?
Only one answer

☐ Via e-mail, once a month
☐ Via post, once a month
☐ Through an app on my smartphone
☐ I don't want to receive information

Could you please give us more information about yourself and your accommodation?

Age: ..... Gender: M / F Nationality: ☐ Italian ☐ _____

Level of education: ☐ Primary school / Intermediate ☐ High school ☐ University degree

Number of people living in the accommodation: ..... Number of bedrooms in the house: .....

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PARTNERS: agenzia per l'energia e lo sviluppo sostenibile di Modena, ACER Modena, ACER Parma

SUPPORT: Alma Mater Studiorum Università di Bologna

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THE HOUSE YOU LIVE IN: NOW OVER TO THE TENANTS

We are going to talk about your relationship with your house and your neighbours. You will help us to do something for you!

1) The city where you live _____, do you like it?
Only one answer

- ☐ A lot
- ☐ Somewhat
- ☐ I live here because I work here
- ☐ If I could I would leave

2) The apartment building where you live, do you like it? ☐ Yes ☐ No

3) If you like it, who do you think deserves the most credit?
Up to two answers

- ☐ Myself
- ☐ My neighbours
- ☐ The municipality
- ☐ The location
- ☐ ACER

4) If you don't like it, who do you think is to blame?
Up to two answers

- ☐ The municipality
- ☐ My neighbours
- ☐ ACER
- ☐ The location

5) You live in an apartment ☐ that you rent ☐ that you own

6) How is your relationship with your neighbours?
Up to two answers

- ☐ Good, we are friends
- ☐ Good, we greet one other and we cooperate
- ☐ We don't cooperate, but we don't have any issues
- ☐ Not good, we avoid one other
- ☐ Not good, we fight

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7) Has your apartment been renovated in the last 5 years? If so, what work was done to it?

- ☐ Yes, _____
- ☐ No

8) If yes, who is doing or did the work
Only one answer

- ☐ I / My family
- ☐ The owner of my house/the municipality
- ☐ ACER
- ☐ Others: _____

9) Did you/would you personally give a hand during the renovation work? ☐ Yes ☐ No

10) To understand what is important to you, please rank the following aspects in order of importance:
With an arrow connect each aspect to a button, just one arrow for each button

Aesthetic/architectural aspect	HIGHEST
Indoor comfort and well-being (i.e.: less humidity)	HIGH
Reduction in energy bills	MEDIUM
Reduction in environmental impact	LOW

11) Are there areas and activities that you would like to have in your apartment building/neighbourhood?
Up to two answers

- ☐ I already have everything I need
- ☐ Caregivers/babysitters
- ☐ Common rooms and areas (garden, gym, _____)
- ☐ Transport to schools, hospitals, shops, etc...
- ☐ Afternoon/evening activities
- ☐ Neighbourhood shops/public transport

12) Would you be willing to contribute financially to these services/activities? ☐ Yes ☐ No

13) Would you like to participate actively in your apartment building/neighbourhood? ☐ Yes ☐ No

14) If yes, how?
More answers possible

- ☐ Cleaning of common areas
- ☐ Green space maintenance
- ☐ Social caretaker/neighbourhood committee
- ☐ Caregiver/babysitter
- ☐ Accompany people to schools, hospitals, shops, etc...
- ☐ Organization of afternoon/evening activities
- ☐ Other: _____

PARTNERS: agenzia per l'energia e lo sviluppo sostenibile di Modena, acer, acer parma

SUPPORT: Alma Mater Studiorum Università di Bologna

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Project partners:

agenzia per l'energia e lo sviluppo sostenibile

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