The REMODECE Project

- Reduce your household electricity bill
- Improve your family´s comfort at home
- Do your bit to reduce the environmental impacts

Why save energy in my house?

The facts:

• Although significant improvements in Energy Efficiency have been achieved in home appliances and lighting, the electricity consumption in the average EU household has been increasing by about 2% per year during the past 10 years.

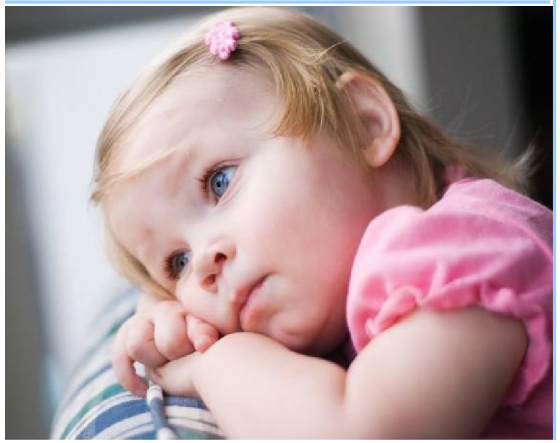
• Increased use of "traditional" equipment: more hours of TV watching, more hours of computer use (driven by some tele-working and increased use of internet), more thermal comfort more lighting more washing and use of hot water.

Action is needed:

The most effective strategy for improving household energy efficiency is to first target home's envelope – walls, attic, windows, and doors. Then reduce the energy consumption of equipment, such as appliances, lighting, entertainment, heating, cooling … Finally, consider renewable energy sources: solar water heating and photovoltaic, wind power, etc.

You can use less energy and still maintain the comfort level. The challenge is to discover wasted electricity that you pay for, but which provides you with no benefits.

Lower energy consumption is essential if we want to cope with the challenges of climate change, and to achieve lower energy costs. This involves reversing the existing trend, so that our total energy consumption decreases.



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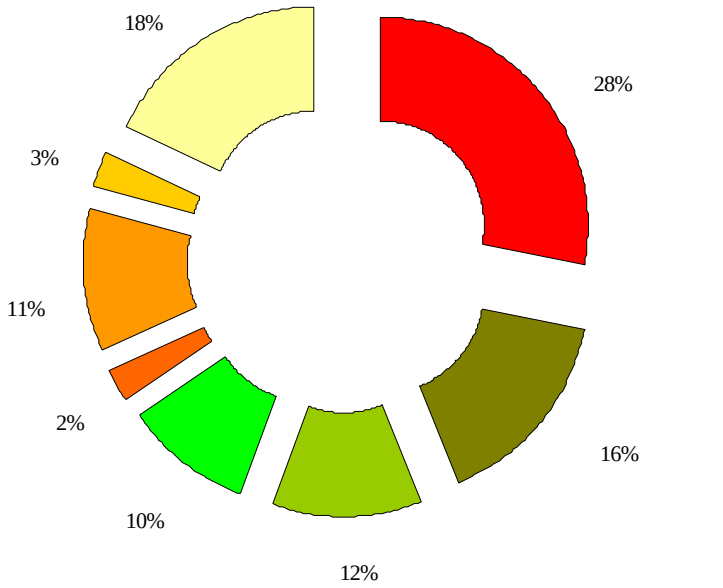
Typical EU household electricity consumption per main end-use



Tips to save energy

- Turn off the lights before leaving home
- Use energy-saving lamps
- Buy Class A or higher efficiencies (A+, A++) appliances
- Use washing machine and dishwasher with full load
- Turn off (TV, DVD, Computer, monitor, printer, etc.) instead of leaving them in stand-by
- If possible use a solar water heater
- Prefer showers to baths
- Use of water saving taps
- Close the water tap when water is not needed
- Use high efficiency windows
- Prefer public transportation than private car, or implement car sharing

Heating/Cooling

Heating/cooling is an important load in household electricity consumption.

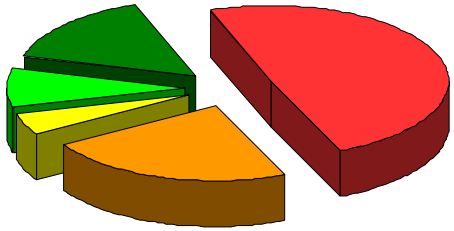
Efficient space heating-cooling

Because electricity is a high quality and expensive form of energy it is important to consider the following:

- Where available (Central and Northern Europe) use district heating
- Avoid resistive heaters. High efficiency heat pumps cost more but can reduce the electricity consumption by 65-80%, and can be used also for cooling
- Use closed fireplaces, instead of open fireplaces, using wood/pellets for much higher efficiency and better indoor air quality
- Natural gas central heating has higher running cost than heat pumps. If already installed, use a high efficiency controller and circulator.

Tips to save energy

- Reduce infiltration in windows and doors
- Use selective energy-efficient windows
- During the night close the curtains and window shutters
- Use heat pumps with a high efficiency (COP>4)
- In central heating systems replace your existing circulator pump with an A-rated equivalent pump
- During the summer use night ventilation for free cooling
- Always close the windows when your are heating or cooling your house



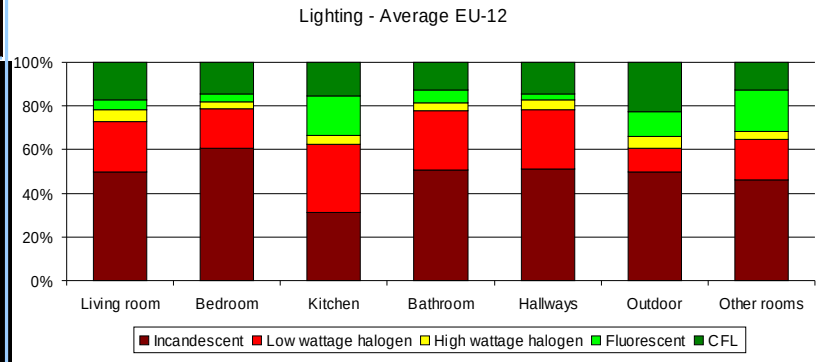
Lighting

• Lighting typically accounts for about **18%** of the total house electricity consumption.

• Conventional incandescent bulbs are very inefficient and should be replaced. Compact fluorescent lamps save 75% of the electricity and last much longer (typically 6 to 12 times). CFLs are now available in different colors e.g. warm white, required for example over the dining table or in rooms where you are painting, studying and redecorating.

• Halogen lamps (both 230V and 12V) used in down-lighters, spot lamps etc. are nearly as inefficient as incandescent lamps. Please consider to replace halogen lamps by the new LED lamp. LEDs price is high but it is a good investment in case the lamps are burning every day.

Type of lighting per room type, EU-12



Tips to save energy

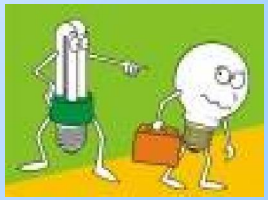
• Use daylight – it provides the best light quality, and it is free of charge!

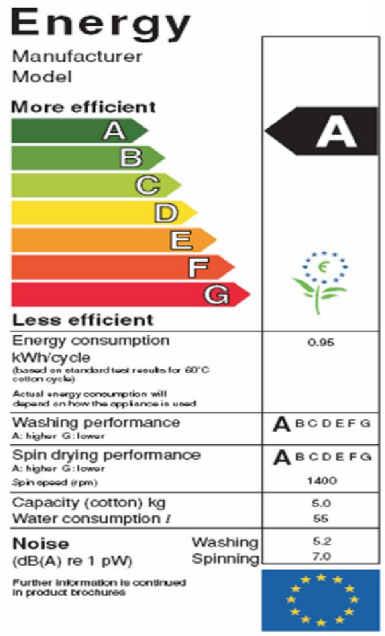
• Use good fluorescent lamp tubes for general direct or indirect lighting e.g. in kitchen, washing room or garage.

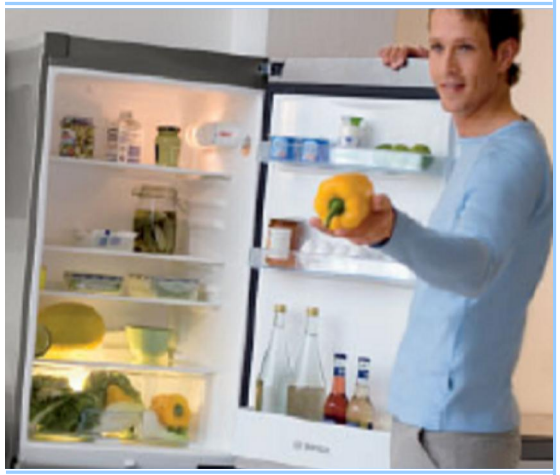
• Switch off halogen light transformers at the main plug.

• Replace your indoor and outdoor incandescent lamps with CFLs. Initial cost of the bulbs is higher but you will recover your investment from the electricity that they will pay for themselves several times over, as they last much longer than incandescent bulbs.

• Consider using new LEDs lamps, shown below to replace halogen lamps.



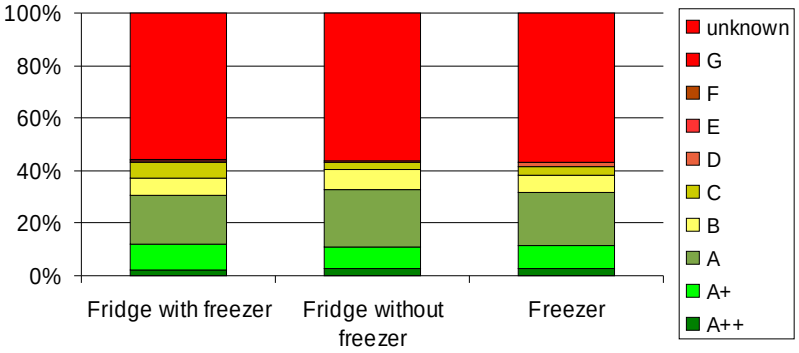




Refrigerators and Freezers

They use around **28%** of the total household electricity consumption. Careful selection and intelligent use are key factors to save electricity. A+ or A++ Fridges and freezers are a good investment because their extra cost is quickly recovered. The market situation for refrigerators is as follows:

Efficiency Class of Cold Appliances - Average EU-12



Buying Tips

• Do not buy a larger unit than you need and look for energy efficient models (A+ and A++).
• You can recover the cost of a new more efficient fridge within two years.
• Remember to dispose the older fridges in the proper manner (call your local waste management facility and ask about disposal of 'white goods"). Using old fridges to cool beer in the garage is very wasteful of energy

Tips to save energy

• Keep your refrigerator at 2,7°- 4,4° C and your freezer at -18°C.

• Keep your fridge away from the oven, dishwasher, direct sunlight or other sources of heat. Allow enough space above and behind (at least 10 cm) it so air can flow.

• Keep your refrigerator filled to capacity, but not too much to the point where doors cannot be closed or air cannot circulate.

• Do not put uncovered liquids in the refrigerator. The liquids give off vapors that add to the compressor workload.

• Allow hot food to cool off before putting it in the refrigerator.

• Don't open the door more frequently than you need to. Don't leave the door open.

• Defrost your food taken from the freezer inside the refrigerator to save energy.

• Maintain the coils in the back of the fridge clean to ensure efficient air exchange. Dirty coils on the back can waste up to 30% of the electricity it uses.

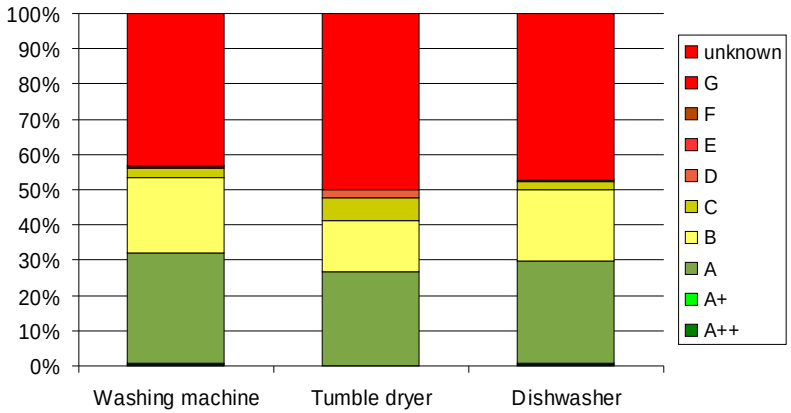
• Check the condition of the door gaskets by placing a money bill against the frame and closing the door. If the bill can be pulled out with a very gentle tug, the door should be adjusted or the gasket replaced. Make sure the door seal is clean and tight.

Washing Machines, Dryers and Dishwashers

Washing Machines and Dishwashers represents around **16%** of the total household consumption.

• Always choose the higher efficiency rated machine available (A or A+)

Efficiency Class of Washing Machines - Average EU-12



Buying Tips

• In terms of features, look for a clothes washer with several water level options (to adjust to different loads). Also, look for pre-soaking capability.
• In dishwasher look for the eco-cycle, which allows natural drying of the dishes, saving a significant amount of energy
• In clothes dryers look for units with automated moisture sensors to reduce drying time.

Tips to save energy

• Use cold water washing whenever possible (or the coolest wash temperature that provides acceptable performance).

• Dissolving powder detergents before you add it to the washer is good practice for all wash temperatures, especially if used in cold water.

• Wash a full load rather than several smaller loads, and try to group clothes by fabric and color, and by how dirty they are.

• Use the sun and wind whenever you can; it's the most environmentally friendly dryer of all!

• Do not overload the dryer; it means a longer drying time (using more electricity).

• Always clean the lint filter after use. A clogged filter consumes more energy and may become a fire hazard if unattended

• Don't use the "rinse hold" feature on your dishwasher when you only have a few soiled dishes.

• Wash only full loads of dishes - but do not overload dishwasher.

• Scrape food off dishes and rinse them with cold water before placing them in the dishwasher.

• Use higher temperature or pre-wash cycle only in the cases of burned-on or dried-on foods.

Cooking

• Cooking at home always sounds healthier and more eco-friendly than the alternative, take-out in all of that excessive packaging.

• Cooking is mostly done using either natural gas or electricity. Electric ovens are much more efficient than gas ovens, where gas hobs have some efficiency advantage over electric cooktops. Electric cooking does not produce harmful combustion gases, being better in terms of indoor air quality.

• Cooking represents on average **11%** of the total electricity consumption in a household with electric cooking.

Buying Tips

• Buy efficient ovens (A Class or above) and efficient cooktops (induction or infrared)

• Convection ovens use a small fan to circulate hot air around the oven. This speeds up cooking time by about 30% and saves the same in energy.

• Combination ovens use microwave technology and halogen lamps to cut cooking time and energy use by 66-75%.

Tips to save energy

• For induction cook tops special pots and pans are required.

• Develop the habit of "lids-on" cooking to permit lower temperature settings.

• For boiling minimize the water used for cooking to avoid having to heat more than is needed.

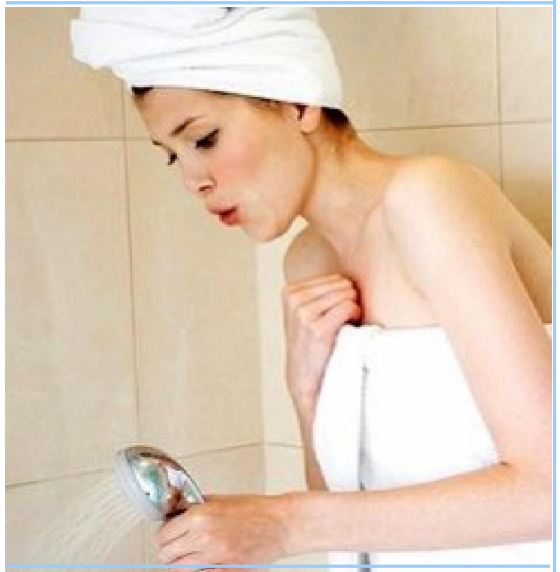
• Begin cooking on highest heat until liquid begins to boil. Then lower the heat control settings and allow food to simmer until fully cooked.

• There is no need to preheat the oven for broiling or roasting.

• When preheating an oven for baking, time the preheat period carefully. Five to eight minutes should be sufficient.

• For small amounts of food use the microwave oven whenever possible, as it draws less than half the power of its conventional oven counterpart and cooks in a much shorter amount of time.

• Use the self-cleaning cycle only for major cleaning jobs. Start the cycle right after cooking while the oven is still hot, or wait until late in the evening when electricity usage is low.



Hot Water

One of the largest energy users in your home, next to heating and cooling system, is the hot water system. Water heating is mostly done using either natural gas or electricity.

Buying Tips

• Buy efficient water heaters, they cost more but the cost is recoverd over their lifetime:
-Solar water heater if house conditions allow
-Heat pump water heater
-Condensing boiler in the case of gas

• Consult a plumber to determine what size water heater you need. Some general guidelines:

- 1-4 occupants: 100-200 liters
- 4-7 occupants: 200-300 liters
- >7 occupants: 300+ liters

Tips to save energy

• Reduce your water heating bill by 10 percent by lowering the water heater temperature from 60°C to 50°C.

• Locate water heaters as close to the points of hot water usage as possible. The longer the supply pipe, the more heat is lost.

• Insulate your hot water supply pipes to reduce heat loss.

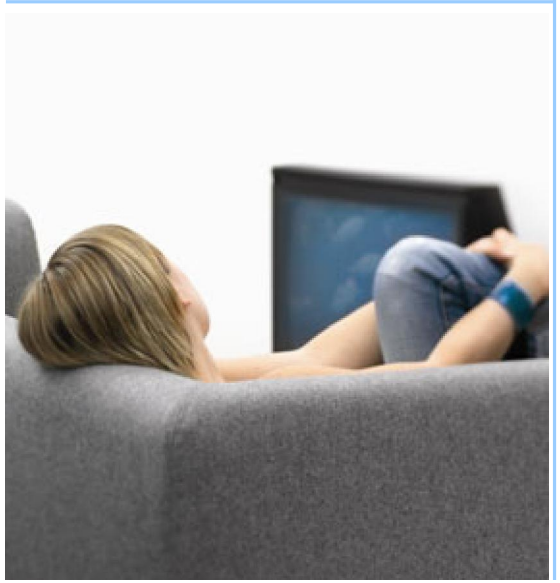
• Consider buying a water heater insulation kit, which reduces the amount of heat lost through the walls of the tank.

• Repair any leaky faucets promptly.

• Take showers instead of baths

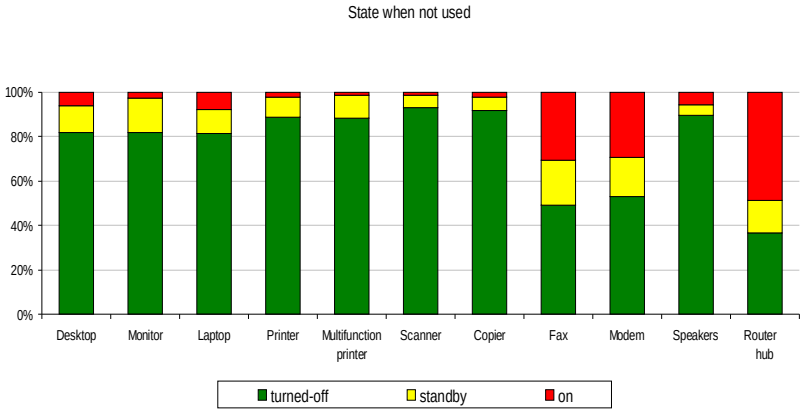
• Use sink stoppers instead of letting water run while shaving and washing dishes.

• If rooms requiring hot water are widely separated, it may be more efficient to install two or more smaller heaters rather than one central water heater.



Entertainment and office equipment

Computers and other home electronic equipment represent one of the fastest growing areas of home energy use. Our Play Stations and electronic gadgets keep several large power plants in business. These appliances represent **22%** of the total household consumption.



A considerable part of a energy use occurs when it is in **active standby mode**, such as when a computer or stereo waits for a click of a button to begin operating. This is also energy used for clocks and display lighting.

Liquid crystal displays are an example of how new technology can decrease our energy use. They are much more efficient than CRT standard monitors and TVs. A new generation of equiment **Organic Leds - OLEDS** will cut consumption by half.

Tips to save energy

- Prefer LCD TVs to Plasma TVs
- Do not buy oversized units -Larger sizes use more energy
- Turn TVs, computers, etc. **fully off** when not in use.
- Use Inkjet printers, which can use 95% less energy than laser printers
- Instead of turning on the TV or video games, go ride a bike or play your favorite sport with some friends.
- Consider using laptops instead of desktops, because they use less electricity
- Always buy, at least, Energy Star labeled equipment, and check for the ECO label.
- Replace your old transforming which spends about 6-10W in standby mode to a new which spend less than a 1W on standby mode.
- Set the computer and screen to go in sleep mode e.g. after 10 minutes out of use.

Standby Consumption

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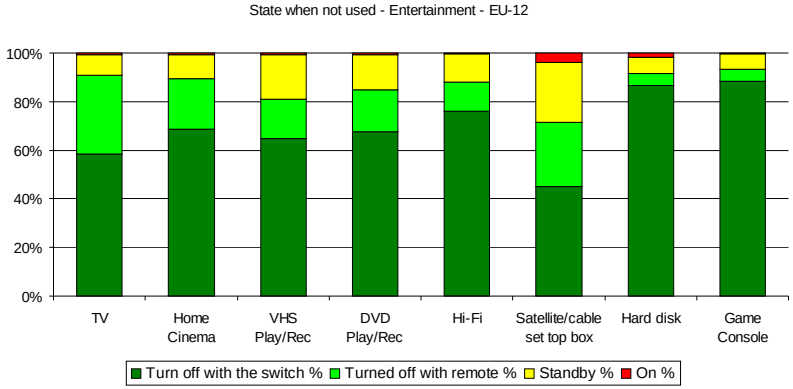
In the standby mode the equipment is connected to the supply, but it is a non-operational mode when compared to the intended use of the appliance's primary function.

• You turn your televisions, VCRs and DVD players off with the remote control when they are not being used. So you think they are not wasting electricity, right? **Wrong!** Many of these appliances run on standby power when they are turned off to operate clocks and remote devices.

• A typical medium size television will consume 100 watts of electricity when on, and, on average, 5-watts when on standby. Therefore, if you only watch the TV for an hour a day, you are paying more for power consumption when the TV is off than when it is on. VCRs and DVD players are worse and use only about 5 per cent of their total energy for intended use (playing and recording videos/DVDs).



There are basically two methods to reduce the standby power consumption: behavioural and technical:

• The first one involves better consumer awareness and education about stand by electricity consumption, and changing behaviour

• The second method of reducing standby power consumption in many appliances is the adoption of technological innovations.

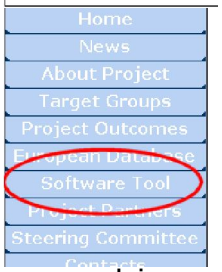
• It is estimated that redesigning appliance circuits can reduce standby power consumption up to 90 per cent.

• Use of intelligent power strips to cut stand by (master-slave type) is a very effective way to reduce consumption.

• Installing a switch in the switching board of the house that cuts off all the circuits for loads that can be turned off.

• You can reduce your electricity bills by as much as 10% - simply by unplugging appliances or switching devices off at the power point they are connected to when not in use. It's good for your wallet and for our planet.

Welcome to the SoftwareTool page



•I – Introduction

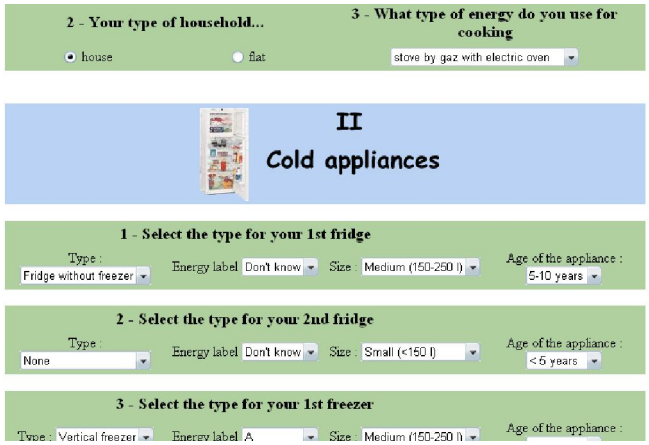
Developed in the framework of the European Remodece project, the software tool enables you to evaluate the consumption of your household and gives you advice on how to reduce it. It is available on the project's website (http://www.isr.uc.pt/~remodece/). Today, due to climate change and other threats, it is essential for everyone to know how to reduce their electricity consumption and at the same time their bill. Based on national values derived from the REMODECE monitoring campaign in each participating country, this tool will give you an accurate way to compare households that have different types of equipment.

II - How to use it ?

It will take you about 15 minutes to answer questions regarding your electrical appliances and the way you use them. At the end of the process you will receive an evaluation of your present situation and a list of improvements you should take. No technical skill is needed to fulfil the questionnaire.

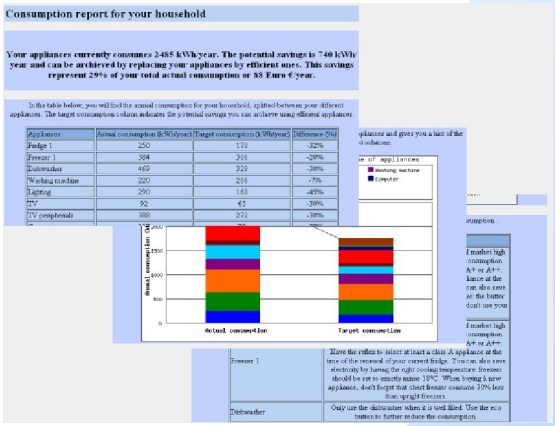
Home Energy Saver

ØØ Click here to access the Remodece site ××



Once you are on the Remodece website click on "Software tool" in the left panel. You can then select the type of windows in which you want to display the questionnaire. For new users, select your country in order to switch to your mother tongue or enter the session ID saved during a previous use. You will then arrive on the questionnaire page. Take your time to fulfil the questionnaire : the reliability of the calculation will depend on the precision of your answers.

Validate your questionnaire will run the calculation and then generate the analysis report.



The report page displays the results in numerical and graphical formats. Each appliance is studied separately in order to show you the most consuming ones. The last part of the report lists all the improvements you could implement in your household.

At the end of the report you can save your session to access it later or to modify your answers in order to compare different types of households.

What is the next step ? Take action ! In order to help you choosing the most efficient appliances, you can use the Top Ten database (http://www.topten.info/).

Supported by
Intelligent Energy Europe

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This project contributes to an increased understanding of current and impending electricity use by European households resulting from different types of equipment, consumers' lifestyles, and comfort levels. The project will also evaluate how much electricity could be saved by the use of the most efficient appliances and by the reduction of standby consumption.

A large-scale monitoring campaign in 12 countries and a consumer survey have been carried out. The research focused mainly new electronic loads such as: entertainment, information and communication technologies, stand-by consumption, lighting, as well as air conditioning in the southern countries. In Central and Eastern Europe, because of lack of reliable data, white appliances have also been targeted.

This brochure is published by the REMODECE Project
For more information: www.isr.uc.pt/~remodece

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