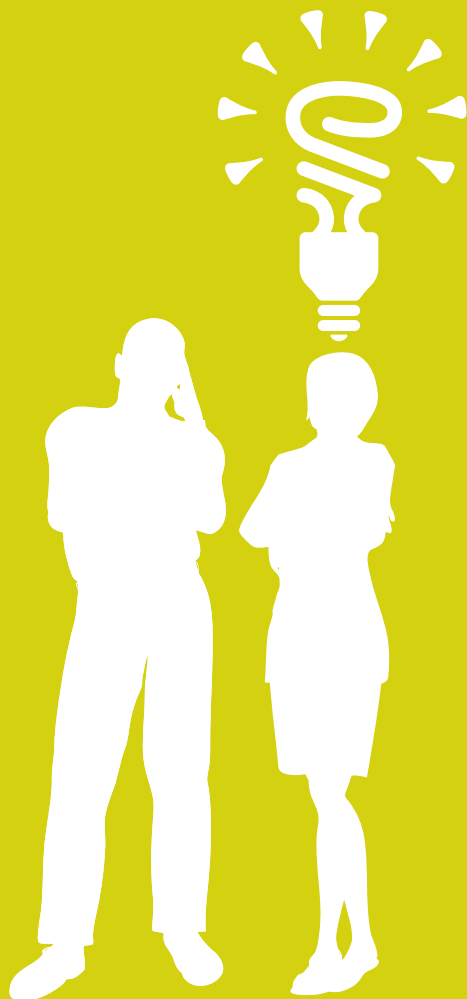


Smart consumption guide



RED ELÉCTRICA DE ESPAÑA

This consumption guide offers information and advice to help you make a more intelligent use of electrical energy.

Red Eléctrica de España thanks you for your collaboration concerning sustainability.



If you consume intelligently, everyone wins.

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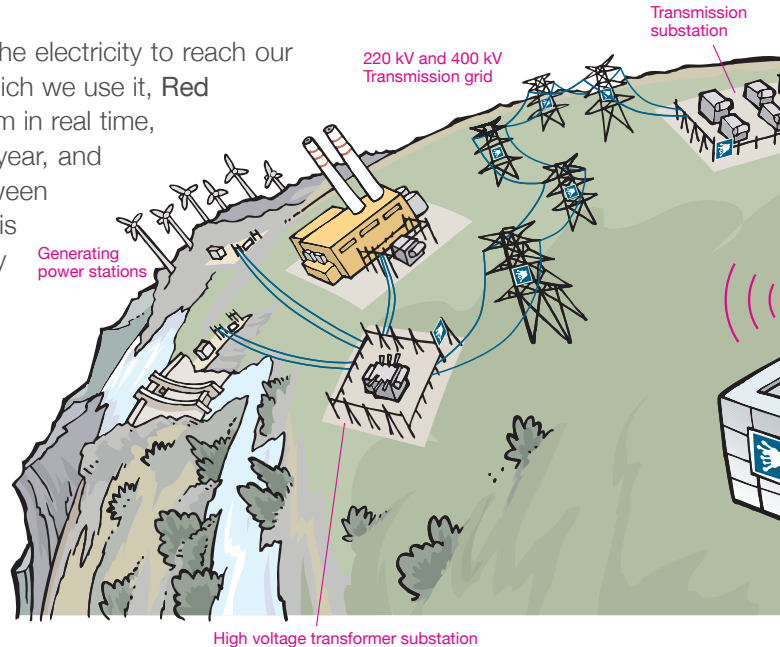
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1. HOW DOES ELECTRICITY REACH OUR HOMES?

Each time we switch on the light or electrical equipment, a sophisticated system is put into operation that starts at the power stations, where electrical energy is generated. Subsequently, this energy transformed into high voltage is carried through electrical facilities (which Red Eléctrica manage, develop and maintain) to the distribution centres. From there, once transformed to the voltage level suitable for each type of consumption (be it for domestic, industrial or services), the electricity is finally distributed to the end-users.

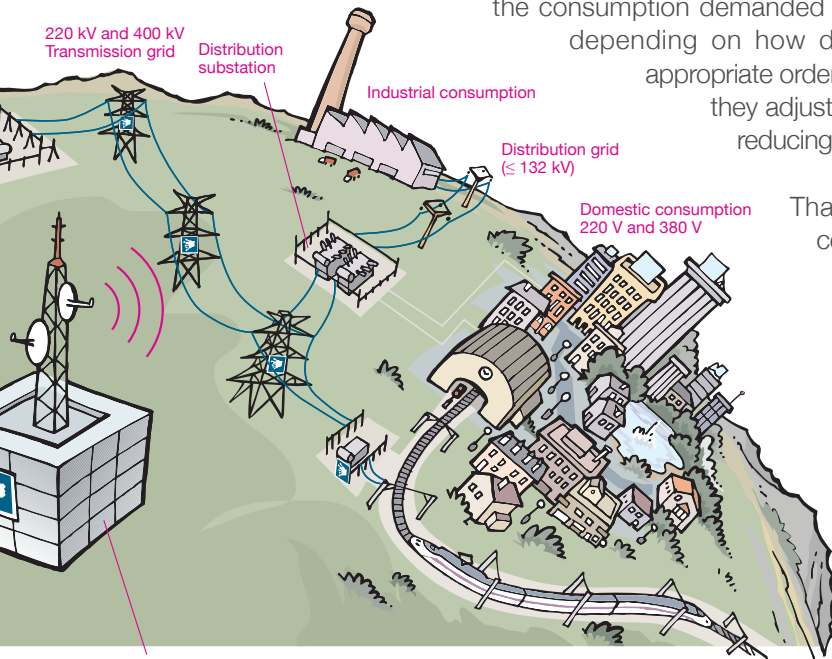
But for this process to work and the electricity to reach our houses in the exact moment in which we use it, Red Eléctrica has to operate the system in real time, 24 hours a day, every day of the year, and maintain a constant balance between generation and consumption. This is due to the fact that electrical energy cannot be stored in great quantities and therefore it has to be generated in each moment in the required quantity.

For this reason, Red Eléctrica forecasts the electricity consumption that is going to be demanded throughout the day for the whole country. With this



forecast, the power stations prepare their production bids for each hour of the day and thus have the energy necessary to cover that demand.

Subsequently, Red Eléctrica, through its electricity control centre (CECOEL), is responsible for maintaining the balance between the programmed production and the consumption demanded at each moment. In addition, depending on how demand varies, it sends the appropriate orders to the power stations so that they adjust their production, increasing or reducing energy generation accordingly.



Electricity control centre (CECOEL) and the Centre for the control of renewable energies (CECRE)

Thanks to this electricity control centre, to which the centre for the control of renewable energies (CECRE) has recently been incorporated, Red Eléctrica guarantees the correct operation of the electricity system, assuring at all times the continuity and security of the electricity supply to consumers.

2. THE ELECTRICITY CONSUMPTION OF OUR SOCIETY



There are various types of electricity consumers: INDUSTRIAL, SERVICES and RESIDENTIAL.



Each action of yours concerning consumption has an instantaneous reflection in the demand curve managed by Red Eléctrica de España.

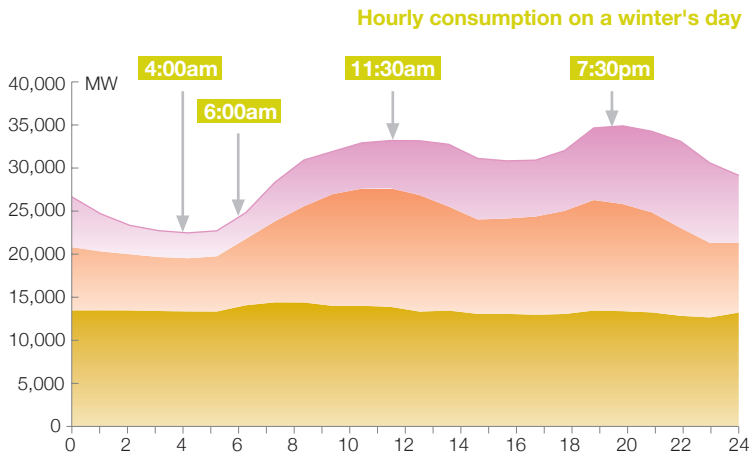
Our society constantly demands electricity to produce goods in factories, to enable commercial and business activities to be carried out and also to allow people to carry out their lives at home. As electrical energy cannot be stored, changes in the demand curve occur throughout the day. For example, the start of the working day, the closure of businesses at lunch time, the increase in the number of people who are at home in the evenings, explains why the demand is not identical every hour throughout the entire day.

During the night-time hours the daily minimum demand occurs. At these times, only the industrial demand maintains an important consumption level. This is due to fact that large factories consume electricity 24 hour a day, also taking advantage of the night-time hours when energy can be contracted at a cheaper tariff. During these hours, some services also stay in operation (lighting of public spaces, hospitals, computer equipment, etc).

6:00am brings about the increase in the demand for electricity, with the start of the working day.

Later, between 11:00am and 12:00am, during the winter, a maximum demand value is reached as at this time activity of the companies is at its highest, and hobs and ovens start being used in homes.

Between 7:00pm and 8:00pm, during the winter, another maximum demand value is reached, due to the combination of business activity and the increased number of people at home.



Visit the Red Eléctrica de España webpage at www.ree.es and see how the demand of the electricity system evolves throughout the year. Observe how demand is lower during the weekend and on Bank Holidays because of the drop in the activity of the businesses and of the services sector.

- Residential
- Services
- Industrial

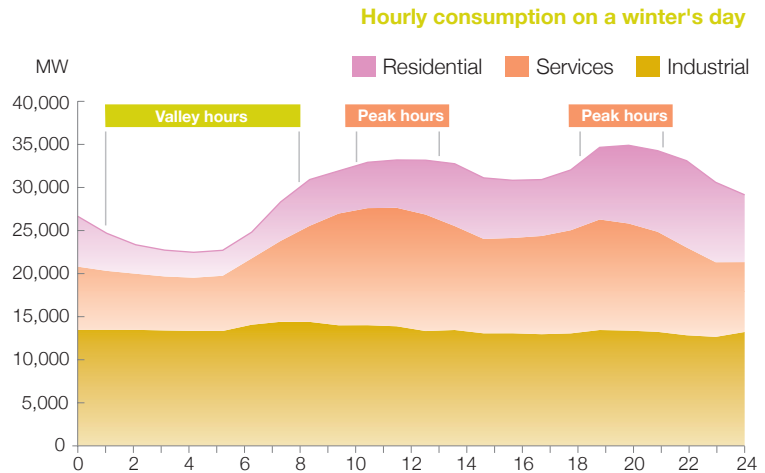
3. WHICH ARE THE HOURS OF MAXIMUM AND MINIMUM ELECTRICAL ENERGY DEMAND?

As a whole, our society demands more energy at specific times of the day: these are known as **peak hours**. During these hours, it is more expensive to produce electricity because it is necessary to use the more expensive power stations, which are also those that produce more CO₂ emissions. In addition, the whole electricity system must be dimensioned in order to be able to deal with the demand in this reduced time-span. In winter, the peak hours of the system occur in the morning and in the evening/night-time, whereas in summer these peak hours take place in the middle of the day, coinciding with the higher temperatures.

The hours of lower consumption are known as **valley hours** and correspond to the night-time hours, coinciding with a period of reduced activity in all consumption sectors.



Did you know that 4,000 MW (the equivalent of ten 400 MW combined-cycle power stations or 4 nuclear power stations) are necessary to deal with the demand of the 300 hours of highest consumption that occur throughout the year?

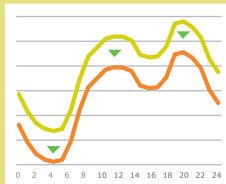


Which initiatives contribute to a sustainable use of energy?

Demand management initiatives aim to encourage a more sustainable use of energy, with the objective of reducing contaminant emissions, integrating the maximum amount of renewable energies and making greater energy efficiency possible in the system as a whole.

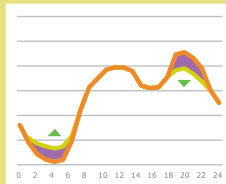
Amongst these initiatives, noteworthy are those measures destined to influence the way energy is consumed so that a change occurs in the daily energy consumption patterns registered in the demand curve, hence allowing its flattening. Depending on the type of impact it has on the demand curve, these are classified in the following groups: reduction of consumption, displacement of consumption from peak hours to valley hours, increasing consumption during valley hours and reduction of consumption during peak hours.

1 Reduction in consumption



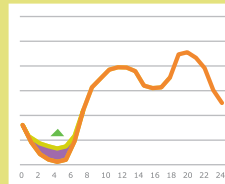
- Improved efficiency of equipment and processes.
- Energy saving awareness.

2 Displacing consumption from peak to valley hours



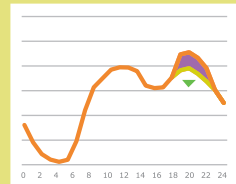
- Time of use tariffs.
- Impact of market prices.

3 Filling valleys



- Pumping stations.
- Storage technologies.
- Smart charging of electric vehicles.

4 Reduction in consumption during system peak hours



- Interruptibility service.
- Automatic load management.

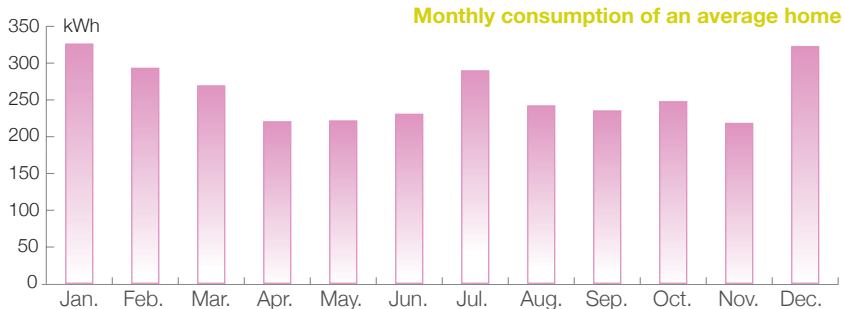
4. DO YOU KNOW YOUR CONSUMPTION HABITS?

The demand of the residential sector represents approximately 20 % of the total electricity consumption in Spain. The amount of energy consumed in a home varies considerably depending on its size, location, type of home and number of people who live in the home.

Average power contracted per home	4 kW	
	Annual	Daily
Average consumption in a Spanish home	3,272 kWh	9 kWh
Average bill	500 €	1.35 €
Average CO ₂ emissions per home	1,300 kg	3.6 kg

How does your consumption throughout the day?

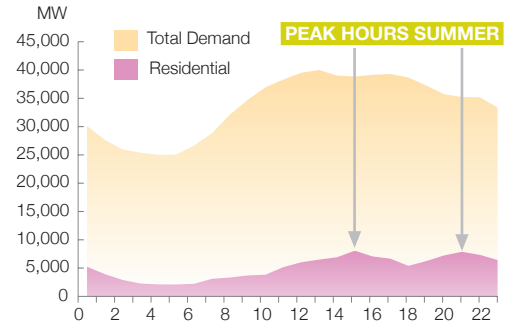
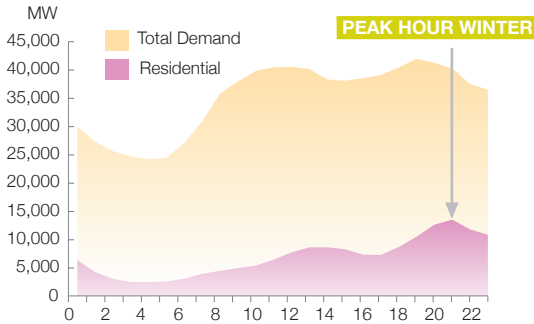
Consumption in homes is higher in the winter months due to a greater use of heating and lighting, and in the hotter months due to the use of air conditioning equipment.



Is your consumption the same throughout the day?

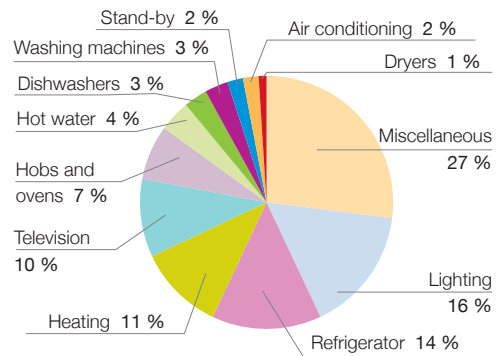
The amount of electricity consumed by homes varies throughout the day and additionally the consumption patterns are different during summer and winter. In winter, homes demand their maximum between 9:00pm and 10:00pm, coinciding with a greater number of people in homes and the intensive use of lighting, heating and television.

In summer, in addition to the peak that occurs in the evening, another maximum demand occurs in homes in the afternoon between 2:00pm and 4:00pm, due to the use of hobs, dishwashers and television, to which we need to add the use of air conditioning equipment.



Do you know what weighting each electrical appliance has on your annual electricity consumption?

The big electricity consumers in our homes are lighting, the refrigerator, heating and television. Even though, we should not forget other miscellaneous apparatus, which individually consume very little but as a whole represent 27 % of the annual electricity consumption.



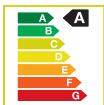
5. IDEAS FOR AN INTELLIGENT CONSUMPTION

As you have seen, each action you take that affects your electricity consumption, can change the way in which our society demands electricity and contributes to a more sustainable and environmentally respectful electricity system.

The following are series of ideas we propose in order for you to use electrical appliances and equipment in a more efficient manner:

Purchase energy efficient appliances.

Electrical appliances with an A++, A+ or A energy rating, are the ones that offer a greater energy efficiency.



Regulate the temperature. It is neither efficient nor economical to be in short sleeves in winter nor with a sweater in summer. Regulate the thermostats.

Switch off electrical equipment not being used.

Make sure that you do not leave electrical equipment on Standby.



Many of these measures will not only represent a saving in your electricity bill, but also will not cost you anything.



Use timers.

If you have the off-peak tariff contracted, programme the timers so that electrical appliances work during the valley hours of the day, which coincide with those having a lower energy cost.

Rationalize the use of energy.

Energy consumption is more manageable than you think. Try not to use equipment or appliances that demand large amounts of energy simultaneously and you will reduce your power needs.



www.ree.es