Energy sources

It has been estimated that the energy lost in power plants is about 60%, in trasmission about 6% and in distribution, 4% of what is produced/ transmitted.

■ The complexity of energy distribution

Over the years, electricity has become so essential to our lives that we now take it for granted: we simply flip a switch and we have instant access to electricity. However, transporting energy from the source to the consumer is quite a complex process, which implies important maintenance tasks and a constant control and coordination of the many devices involved in the transmission and distribution of energy.

Power losses

One of the main problems of electricity transmission is the power lost along the transmission lines during the journey from the power station to the area of the consumer.• In fact, while travelling along the cables and wires, electricity warms them up and thereby loses some of its energy in the form of heat; this is known as transmission loss. The amount of the loss depends on the voltage, so transmission lines lose less energy than distribution lines. The use of superconductive materials could significantly reduce transmission and distribution losses, but, unfortunately, the cost of this technology is still very high and would not be covered by the



money saved in making the transmission more efficient and up-to-date.

Weather impact on power distribution

Climate change and weather conditions can also affect power distribution. Extreme natural events such as intense storms, hurricanes or floods can damage the different components of the electrical grid and cause widespread blackouts. In addition, extreme temperatures can cause higher energy consumption. When demand is high, as happens during the day and especially in summer, losses are higher; when it is low, like at night, losses are lower. This is the reason why it is of fundamental importance to ration electricity consumption in order to avoid the risk of overloading the power network, which could cause a power outage.

to carry out: eseguire to flip: *azionare* flood: inondazione to handle: gestire, maneggiare to imply: implicare to lack: mancare di outage: blackout, interruzione di corrente overloading: sovraccarico to take something for granted: dare per scontato



MechPower, New Edition - Copyright © EDISCO Editrice - Vietata la vendita e la diffusione

F DS

1 📃 Identify the statements from the previous text as true, false or doesn't say.

- 1. Devices involved in power distribution must be checked twice a month.
- 2. People have got used to having electricity.
- 3. During transmission, electricity is mainly dispersed as heat.
- 4. Losses are higher in an area with a low population density.
- **5.** Superconductive materials for power transmission are being experimented with in Silicon Valley.
- 6. Power consumption is higher at night.
- **2** Eill the text with the given words.

failures (2) • circuit • equipment • breakers • disconnect • distribution • plug

And if we Should Ever Lack Electricity?

We are relying more and more on electricity to carry out a great variety of activities either related to leisure time, household tasks or work. Any failure in the electricity **1**. system could have serious consequences on people's lives and safety, especially in places like hospitals, airports, train stations and traffic control, which heavily depend on electricity to operate their vital **2**. The most frequent cause of **3**. can be attributed to electrical circuit overload. Overload is what can happen in our house when we **4**. in and use too many appliances at the same time. By doing so, you draw more electricity than your household electrical

network can handle. Circuit **5.** can help stop the current flow and prevent wires from overheating and causing fires. A power grid is itself an electric **6.**

which serves far-off places: when too many people are connected to it at the same time, or when something has damaged one of the several components of the network, the

grid might not be able to meet the high energy demands. To prevent any serious consequences, it might be necessary to **7.** the system, even though that means leaving people without power.

There have been some events of this kind; in September 2003 Italy experienced one of its worst ever power **8.**...., which left all of its citizens without power. The origin of the incident appeared to be a breakdown along the transmission line carrying electricity from Switzerland that resulted in an overload on the remaining lines, and this meant that the Italian system was isolated from the European network for almost a day.

> Adapted from: https://www.ucsusa.org/resources/ how-electricity-grid-works

https://www.nytimes.com/2003/09/28/international/ europe/massive-power-failure-sweeps-across-italy.html

Read the above text again and match the two parts of the sentences.

- 1. Nowadays some vital services cannot...
- 2. When a blackout occurs, ...
- 3. Household appliances can cause an overload if...
- **4.** If wires overheat, ...

3

- 5. Energy demand is lower...
- **6.** A failure along the transmission line in Switzerland...

- a. during off-peak hours.
- **b.** there could be serious problems for people's lives.
- c. resulted in a huge blackout in Italy.
- **d.** we use too many of them at the same time.
- e. they can cause fires.
- f. do without electricity.

MechPower, New Edition - Copyright © EDISCO Editrice - Vietata la vendita e la diffusione



