

# Power, power on the wall, where did you come from?

## - WHY? - Cyril – 1S

Electricity is omnipresent in our world. Wherever you go, there's a good chance that you're being lit up by electricity, heated by it or using it in order use various appliances. But how does this electricity get to you in the first place?

First of all, the energy has to be generated – this is done by a power plant. In most cases, they function by having turbines rotate and generate the electricity. These turbines can be rotated by steam (water heated by combustion of fossil fuels or by a nuclear reactor), by water (dams) and by air (wind farms). Nowadays, there are also “solar farms”, but these are much less widespread.

So, now that we have the energy, it's time to send it over to the consumers, and make them pay for it! This is done by the power grid.

After being generated at a few thousand volts, the electricity enters the “transmission grid”. A substation converts the electricity to very high voltages (up to 765,000V) in order to transport it. This high voltage is needed to minimize loss of energy over large distances. Early on, the electricity that was generated was DC, or “direct current”. The problem with direct current is that its voltage cannot be efficiently changed. Nowadays, we use “AC” alternating current, which is easily convertible.

The high voltage electricity is then carried throughout the country by transmission lines, huge metal towers that you can see blotted all over the countryside. Once it arrives closer to urban areas and homes, it passes into the “distribution grid”. The high voltage is “stepped-down” to lower voltages by various transformers, the lowest voltage achieved being around 7,200V.



A magnificent sunset putting one of man's greatest inventions on the spot: the transmission line.

This electricity is then set through the distribution grid to homes and businesses, through underground cables in urban areas and utility poles in less densely populated. It is finally at this point that it is converted down to the 240V you get in a wall socket, as well as where the meter is placed, and your usage is measured.