



National Operational Guidance



NFCC
National Fire
Chiefs Council

Developed and maintained by the NFCC



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Information

The high-voltage networks are operated by:

- National Grid - England and Wales
- Scottish Power - Southern Scotland
- Scottish Hydro - Northern Scotland and Scottish islands
- Northern Ireland Electricity - Northern Ireland

The distribution network operators (DNOs) own and operate the distribution network of towers and cables that bring electricity from the national transmission network to homes and businesses.

Refer to the [National Grid website](#) for a map showing the DNO locations, plus full contact details of the operators.

Electricity is transferred from power stations/power-generating facilities to customers through the wires and cables of the national grid. When a current flows through a wire, some energy is lost as heat. The higher the current, the more heat is lost. To reduce these losses, the national grid transmits electricity at low current, but to achieve this the supply is at a high voltage.

Power stations produce electricity at 25kV. Electricity is sent through the national grid network at 400kV, 275kV and 132kV.

Step-up transformers are used at power stations to produce the very high voltage needed to transmit electricity through the national grid power lines. These high voltages are too dangerous to use for home and businesses and therefore step-down transformers are used locally to reduce the voltages to a safe level, resulting in a supply of:

- Large industrial consumers - 33kV
- Rail network - 25kV to 33kV
- Small industrial consumers - 415V to 11kV
- Residential and small commercial - 230V

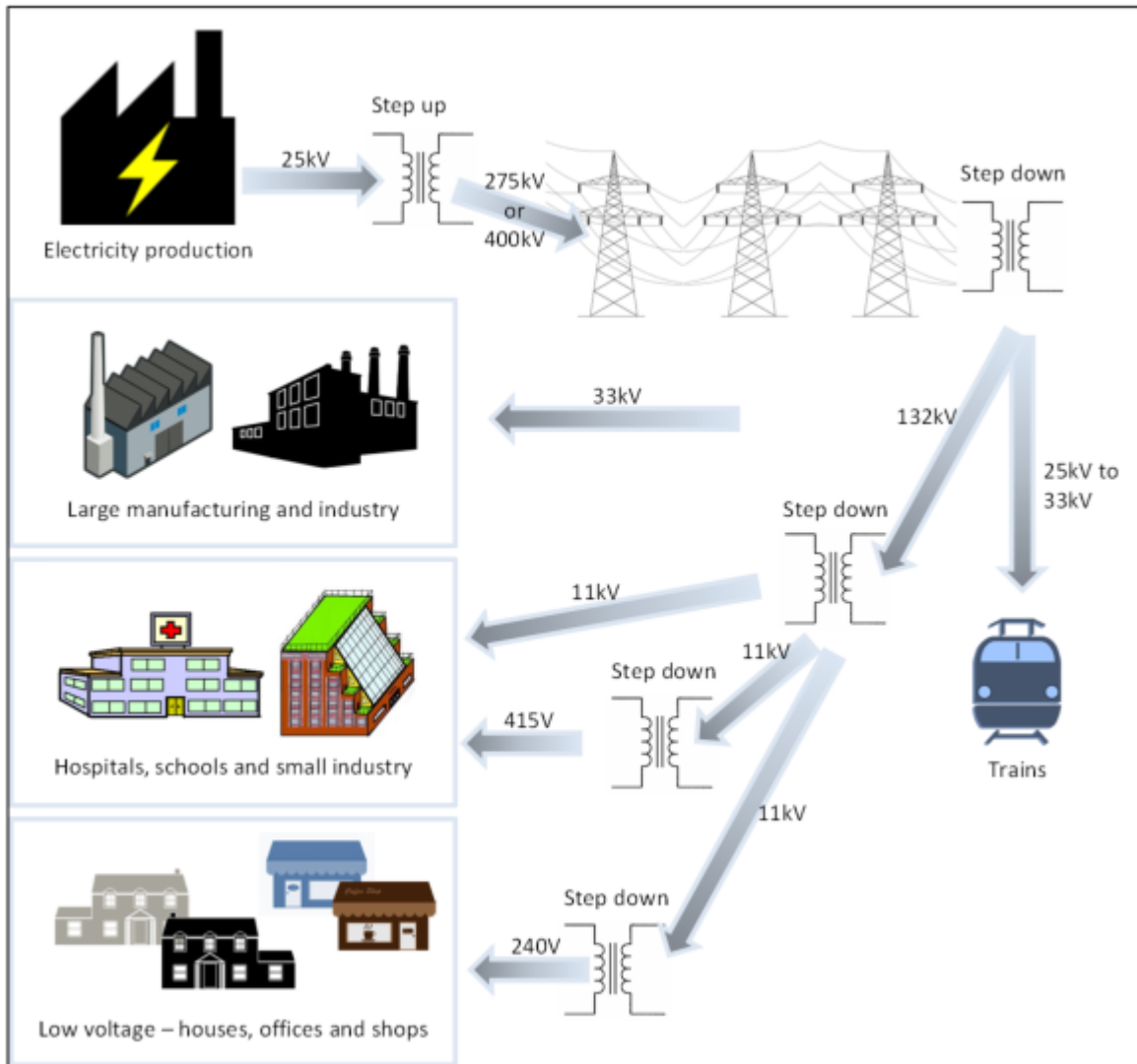


Figure 2: UK electricity distribution - diagram courtesy of London Fire Brigade

The national grid is made up of many components, each of which will be covered individually. These facilities will be well managed, professionally run, have extensive emergency action plans and provide ample signage to warn of high voltages and relevant dangers.

The Health and Safety Executive guidance note on [Avoiding danger from overhead power lines](#) provides further information, such as types of overhead power lines and their heights.

Hazards (for further information refer to National Operational Guidance: Utilities and fuel)

- Electrocutation, which can occur without physical contact with equipment
- Confined spaces
- Chemical hazard
- Working at height
- Superheated steam or water under high pressure



- Explosive atmospheres due to gas supplies
- Oil-filled switchgear, transformers, regulators and capacitors, which, once alight, will need to be fully isolated before firefighting operations are commenced
- Smoke and gases due to burning oil and insulating materials
- Explosions from oil-filled equipment, both overhead and at ground level

References and further reading

<https://www.energy-uk.org.uk/energy-industry/the-energy-market.html>

www.emfs.info/sources/substations/

www.energynetworks.org/info/faqs/who-is-my-network-operator.html

www.bbc.co.uk/search?filter=bitesize&q=electricity

<http://www.hse.gov.uk/electricity/information/overhead.htm>