02 What are flexibility services?

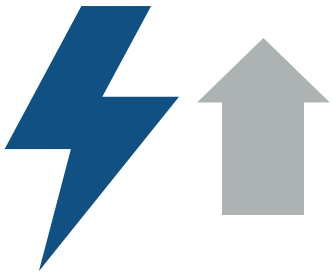
Smart energy technologies are now being used to provide flexibility services to manage Great Britain's electricity networks smarter and more efficiently. The Open Networks Project is key to enabling these new markets to emerge and grow. They will help to keep electricity network costs low for the public, integrate low-carbon energy and create opportunities for everyone.

This is all part of a wider digital transformation of the energy networks which harnesses the power of technology and data, known as the Internet of Energy.

There are three main reasons for using flexibility services as an alternative to traditional forms of energy network infrastructure such as new pylons, transformers and substations.

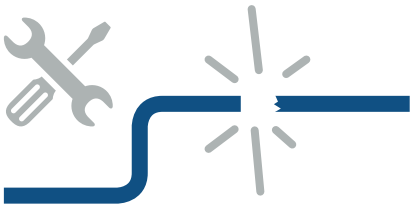
01

Responding to congestion on the grid, caused by increasing electricity demand or excess generation from local energy projects.



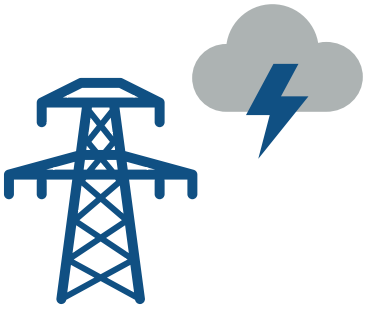
02

Managing network interruptions during routine maintenance activities, such as replacing old cables and cleaning equipment.



03

Responding to unplanned network outages, such as power faults during bad storms.



Three key types of emerging smart energy technologies which can be used to provide flexibility services.

Demand-side response

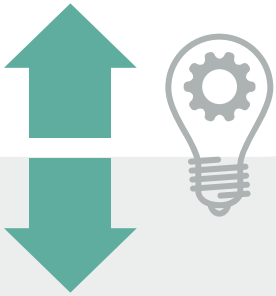
The public can provide flexibility services to local electricity network operators by turning their electricity use up or down at different times of the day in return for a payment.

A family can turn up their usage by charging their electric vehicle when their neighbours are generating excess electricity from solar panels.

A business such as a manufacturer or a farm may form an agreement to adjust their electricity use at times when they need it least.

Energy storage

Energy can be stored by homes and businesses to be used at a later time, providing back-up power when it is needed or as an alternative source of energy for the local electricity grid.



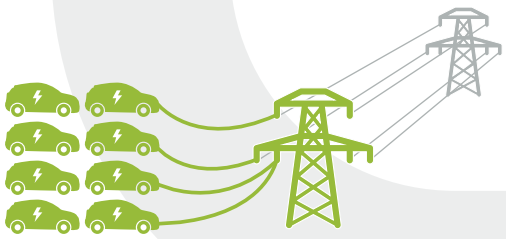
A household may install smart appliances such as light bulbs, thermostats or refrigerators which track energy usage and adjust energy use up or down.

Households can use a battery system to store excess energy from their solar panels and sell it to network operators when the grid is busy.

Virtual services

Virtual power plants enable different, sometimes very small, sources of electricity from homes and businesses to be combined to manage the grid.

A smart control system may be used to combine solar PV power and battery storage from homes and businesses to provide additional power to the grid.



A small business with a fleet of electric vehicles may use them as battery storage to provide services to the grid.