

# Smart grids: How energy is becoming more intelligent

Over the next 30 years, changes to the way we produce and consume electricity will have a significant impact on our grid infrastructure. Spencer Thompson, Business Development Director at VINCI Energies, discusses how smart grids are providing the solution...

The way we generate and consume electricity is rapidly changing. It is estimated that by 2035, over half of the world's electricity will be generated by renewable sources, such as wind and solar farms. At the same time, electricity consumption is expected to have doubled by 2050, due largely to the proliferation of electric vehicles.

Until relatively recently, today's power grids haven't changed much in the last 100 years: electricity is generated at a coal, nuclear or hydro energy plant and is then passed through transmission lines, substations and transformers before finally reaching your home or place of work. This entire process happens in a blink of an eye, with every kilowatt needing to be used the instant it is created. As a result, utility companies have to judge supply versus demand with pinpoint accuracy, every second of the day. If demand outstrips supply, network reconfiguration is sometimes deployed and back-up power is activated, which costs money and wastes fuel.

Thankfully, new applications in software and digitalisation are making grids smarter and more efficient, enabling the networks to be more flexible and balance changing consumer demands. Smart grids are the key enabler to facilitate a low carbon future as we head to our global 2050 targets.



## The smart solution

By introducing sensors in our homes and places of work – known as smart meters – utility companies receive real-time data about energy use to better prepare and model future demand. As sensors become cheaper and the Internet of Things (IoT) becomes widespread, utilities are adding more sophisticated technologies to the power grid – known as a smart grid.

Smart grids help reduce power failures, reroute electricity and avoid overloaded transformers and powerlines. They also help to reduce climate change by allowing renewable energy sources to be introduced into the grid.

Historically, the intermittent electricity produced by wind and solar farms was very difficult to implement as its output was difficult to judge. However, thanks to advances in energy storage solutions, electricity can be stored and fed into the grid as and when it's needed, such as using battery storage units.

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