

# On-site generation: which option is best for my business?

If your business is interested in investing in on-site generation, there are a range of technologies available to you - but which one is the ideal solution for your organisation?

Let's take a look at some of the pros and cons of the most common on-site generation technologies...

## Wind turbines

### How it works

When the wind blows, the blades of a wind turbine are pushed round, which drives a turbine that generates electricity.



### Pros

- Wind is free, so you can significantly reduce your electricity bills
- Wind is also a renewable source of energy, so switching to on-site wind generation can contribute to your net zero journey
- With proper maintenance, wind turbines should last 20 years or longer<sup>1</sup>
- You may be able to access new sources of revenue through schemes like Contracts for Difference and the Smart Export Guarantee.

### Cons

- You will require planning permission, plenty of space and a good grid connection due to the voltage variations associated with wind power
- Your site needs to have a high average annual wind speed (>7 metres per second) to make a turbine worthwhile
- Energy generation can be intermittent - when wind speeds fall, generation output will fall too
- Turbines can be vulnerable to damage due to corrosion, fatigue and lightning strikes.

### Pros

- PV panels can be installed on your roof or on the ground, depending on space
- Roof installations <1MW do not require planning permission
- Solar is a renewable form of energy, so using electricity generated by your solar PV panels can help to reduce your Scope 2 emissions
- You may be able to access new sources of revenue through schemes like Contracts for Difference and the Smart Export Guarantee.

### Cons

- Solar PV panels require regular maintenance and cleaning for optimum performance/returns
- Energy generation can be intermittent - when the sun doesn't shine, output will fall
- PV panels require more space than you might imagine - typically, one square meter of solar panel provides around 175W of power (in ideal conditions)
- Ground installations will require planning permission and may require an Environmental Impact Assessment.

## Solar PV

### How it works

When the sun shines, the photovoltaic (PV) cells in a solar panel absorb the sunlight, which creates an electric current.



## Air/ground source heat pumps

### How it works

Air source heat pumps absorb heat from outside air and pass it over tubes containing refrigerant in order to produce heat, while ground source heat pumps use pipes to extract heat from the ground.



### Pros

- Heat pumps can provide your business with both heating and hot water.
- As they are powered by electricity, both ground and air source heat pumps can help you to reduce your carbon emissions
- In ideal conditions, air source heat pumps can be incredibly efficient - for every one unit of energy they use to extract air from outside, they can produce up to 3 units of heat energy<sup>2</sup>.

### Cons

- If your building isn't well insulated, then a heat pump may not provide enough heat to keep your team comfortable
- If you're replacing a highly efficient (A-rated) gas or oil boiler, your energy bills could rise<sup>3</sup>
- The fan can be noisy, so you will need to think carefully about where it's located
- Air source heat pumps can be less efficient if the air is very cold outside
- Installation can be tricky - you might need bigger radiators or to dig into floors.

### Pros

- CHP units are highly efficient, as they make use of heat which would otherwise be wasted
- With a CHP system on-site, you can typically save around 20% of their energy costs<sup>4</sup>
- By generating both heat and power, CHP can reduce carbon emissions by up to 30% compared to conventional generation<sup>5</sup>
- If your unit qualifies for the CHP Quality Assurance programme, you can access a range of benefits, such as exemption from the Climate Change Levy, Enhanced Capital Allowances and preferential business rates
- You may be able to access new sources of revenue through schemes like Contracts for Difference and the Smart Export Guarantee
- A CHP may support your sustainability goals if you're using renewable energy sources to fuel it.

### Cons

- You need to have adequate space for a CHP unit, with good ventilation for the exhaust
- Units of 0.5MW or above will need planning permission
- CHP units need to run at full load for around 14-16 hours a day to maximise their efficiency, so you need to size your unit carefully
- CHP systems consume more fuel than traditional boilers, so you will need to ensure a steady supply of fuel.

## Combined heat and power

### How it works

Combined heat and power (CHP) units capture and utilise the heat that is a byproduct of the electricity generation process, so heat and power can be generated simultaneously.



## Talk to our experts

Investing in on-site generation is often a key element of any organisation's net zero strategy - so it's worth seeking expert advice to ensure that you choose the best technology for your business.

Our on-site generation experts can help you to assess, install and get the most out of your solution - so talk to us today on **01772 689 250** or email **hello@inspiredenergy.co.uk**.

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<sup>1</sup><https://www.energy.gov/energysaver/installing-and-maintaining-small-wind-electric-system>  
<sup>2</sup><https://www.nu-heat.co.uk/renewables/air-source-heat-pumps/#:~:text=How%20efficient%20are%20air%20source%20heat%20pumps%3F&text=An%20air%20source%20pump%20is%20around%20300%25%20efficient.,heat%20energy%20into%20the%20property.>

<sup>3</sup><https://www.which.co.uk/reviews/ground-and-air-source-heat-pumps/article/air-source-heat-pumps-explained-ai5MC4f773Zq>

<sup>4</sup><https://www.gov.uk/guidance/combined-heat-and-power>

<sup>5</sup><https://www.gov.uk/guidance/combined-heat-and-power#about-chp>