

Energy Saving Fact Sheet | **Compressed air**



Making business sense
of climate change

Take the pressure off your energy bills

Compressed air is a versatile, flexible and safe way to transmit energy. Almost all industrial businesses use it. In fact, over 10% of electricity supplied to industry is used to compress air. However, as much as 30% of this energy is lost through leaking systems – equal to the entire output of a medium-sized power station. Much more is wasted due to compressed air misuse and poor maintenance.

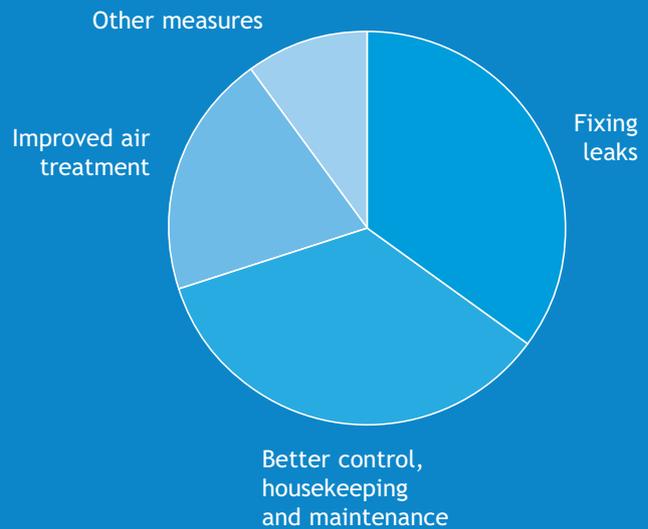
Energy wasting hot spots

This guide will help you spot where energy is being wasted in your compressed air system and highlight simple improvements that could save money. For many more helpful hints, call the Carbon Trust on 0800 085 2005.

fact:

Compressed air leaking through a single 3mm hole could cost you over £500 per year!

How you could save energy across your compressed air systems



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Good maintenance and housekeeping

A well-maintained compressed air system needs less energy to deliver the required pressure. And it's easy to do.

- ▶ **Change it.** It costs just a few pence to replace an intake filter and could save pounds in energy; blocked filters restrict the air flow into a compressor, increasing the power used by 4% and reducing efficiency.
- ▶ **Clean it.** Keep compressor coolers, radiators and ventilation grilles clean and clear to minimise compressor power use. The dirtier your process, the more often you'll need to clean.
- ▶ **Cut it out.** Remove any redundant and seldom-used pipework or fit isolation valves.
- ▶ **Reduce it.** Is your compressor bigger than necessary? Compressing more air than you need is very expensive. You can determine your maximum compressed air demand by running all air-powered tools and equipment flat out at the same time and noting the drop in air pressure.

Convenient, but costly

As well as driving air-tools, compressed air powers all sorts of machinery including conveyor systems, mixers, presses and moulding equipment. While compressed air is clearly a convenient source of power, it is expensive to generate.

By the time it reaches the end user, the cost of compressed air can be as much as 50 pence per kWh, compared to around 5-7 pence for 'normal' electricity.

So it's important to consider carefully whether compressed air is the best power source for a particular job. Many businesses don't do this and 'misuse' compressed air for things such as machine cleaning, without realising the cost.

Find the appropriate alternative and you could save considerable energy and money.

Types of system

Portable units, where the main components are combined in one machine, are the most common. These are generally used for small-scale applications, or when a mobile power source is needed. Businesses with a larger demand for compressed air may use a system with separate units and fixed air line distribution pipework.

Better control

Simple adjustments and improvements to your compressor control can save pounds.

- ▶ **Switch it off.** An idling compressor can still use 40% of its full load.
- ▶ **Downsize.** Determine the minimum system pressure and adjust the compressor accordingly. Ask equipment and tool manufacturers to specify the minimum air pressure that their equipment needs.
- ▶ **Automate.** Consider installing an automatic pressure controller: this will ensure you always have the most efficient air pressure setting.
- ▶ **Minimise pressure drops.** It's important to keep the system pressure drop below 0.2 bar. Take a reading of the pressure at the compressor with a pressure gauge and then, using the same gauge, take a measurement at the farthest point on the site. Large pressure drops indicate that the air pipe is too small, stifling the airflow.

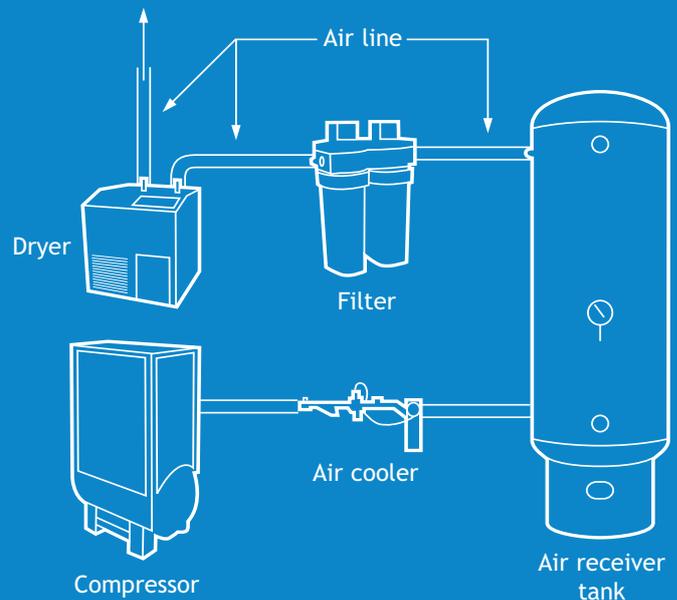
How a compressed air system works

Your compressed air system may have more than one of the components shown in the diagram below, together with various valves and gauges.

Basic components in a non-portable compressed air system

The **compressor** takes in air and compresses it to the required pressure; good control and maintenance are key to saving energy here. The **receiver** provides a reservoir of air to ensure that the system can manage variations in demand. **Filters, coolers and dryers** treat the air to maintain quality. They remove water, oil and particles that can contaminate the air and reduce efficiency. The **air line** is the distribution network that feeds the system and supplies the equipment with air.

Start improving energy efficiency by drawing a plan of your system. This will help you identify components and the flow of air.



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Improved air treatment

Raising the quality of your compressed air can make a real difference to energy efficiency.

- ▶ **Strike a balance.** Having hot, wet or 'dirty' air means that the compressor has to work harder. However, treatment itself can use energy, so always treat the air to the lowest acceptable level.
- ▶ **Treat locally.** If only a few pieces of equipment require high-quality air, treat at the point of use rather than treating the whole supply.
- ▶ **Stay in good shape.** Change filter elements regularly and have any condensate collection system checked regularly to ensure that it's working effectively.

Waste heat recovery

It's easy to obtain hot water or hot air by recovering heat from a compressor. Here's how your business may benefit:

- ▶ **Space heating.** You may be able to duct hot air into a workshop or warehouse to provide 'free' heating.
- ▶ **Air tempering.** If the hot air flow is insufficient to heat the full space, it can still be ducted into the existing space-heating system for preheating.
- ▶ **Keeping things dry.** Simply placing a compressor in a warehouse may provide enough heat to prevent product and packing materials e.g. cardboard boxes becoming damp.

Take action!

Start saving energy today

Allocate responsibility to a member of staff or small team who can drive forward energy saving measures:

1. **Raise awareness.** Make sure that everyone knows the high cost of producing compressed air. Continue to remind people that leaks cost money.
2. **Find all leaks** and fix them as soon as possible.
3. **Ask searching questions.** Is your compressor bigger than it needs to be? Can you reduce the scale and capacity of your system?
4. **Can you lower the pressure?** Don't compress air to pressures higher than is really necessary. Check the requirements of your equipment and tools; set the system pressure to the minimum needed.
5. **Turn compressors off.** Leaving compressors running when they aren't required, such as during breaks, is just throwing money away.

Call the Carbon Trust for a copy of *How to find and repair compressed air leaks* – our step-by-step guide to energy saving. We can also give you further energy saving advice for your business.

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More ways to save

ECA and Energy-Efficiency Loans

If you're considering installing a new compressed air system, buy one on the approved Energy Technology list (at www.eca.gov.uk). This details products that meet certain energy efficiency criteria. You may also qualify for a valuable Enhanced Capital Allowance and an interest-free loan from the Carbon Trust. Call 0800 085 2005 for more information.



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The Carbon Trust helps businesses and public sector organisations cut their energy costs to combat climate change through the provision of free, professional advice and assistance.

Want to find out more?

You can obtain these useful energy saving guides at www.carbontrust.co.uk/energy or by calling the Carbon Trust on 0800 085 2005.

GIL150 How to find and repair compressed air leaks

GPG385 Energy efficient compressed air systems

We've got many more tips on compressed air systems that will help you save energy and money. So give the Carbon Trust a call today.

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