Tools to help you plan and record (and remember to celebrate success)

The steps above will help you decide what actions to take. You also need to decide who will be responsible for getting the job done. Here is a simple way to plan this.

Example action plan

Investigation	Action needed	Desired outcome	Who's responsible/ deadline
How much do we spend every year on compressed air?			
Are our compressors idling needlessly? If so, what should we do about it?			
Do we have a regular maintenance schedule? Who's in charge of this?			
Who's checking for leaks and repairing them? Who's our preferred repair company?			

Example recording chart

Who	Action taken/when	Impact

Remember

Improve the efficiency of your air compression system and you can save up to 30% of the money your site spends on air compression!

HOW-TO GUIDE

Keep compressors on a low pressure and don't overuse

HOW-TO GUIDE

What this guide is about

This guide is designed to complement the compressed air toolbox talk. It focuses on:

- Why it makes sense to save energy on your compressed air system
- Practical steps to make your system more efficient
- Tools to help you plan and record

The purpose of the guide is to help you make a business case and action plan for bringing your air compressors to top efficiency, including better maintenance schedules, a comprehensive leak detection and repair scheme, heat recovery, and, if necessary, good machine selection. Keep the guide as a reminder for yourself, hand it out to the person on your site who may take charge of this action plan, or simply write on it to keep a record of all actions taken.

Why it makes sense to save energy on your air compression system

- Compressed air is the most expensive utility used on your site – more expensive than electricity, water and gas. It takes more than 10 units of electrical power to provide 1 unit of compressed air.
- You can save up to 30% on the energy used in a typical compressed air system with better maintenance schedules, comprehensive leak detection and repair schemes, good heat recovery and machine selection.
- Easy steps yield fast results:
  - For every 0.5 bar reduction in pressure, a compressor uses up to 4% less energy.
  - A 10°C reduction in inlet air temperature leads to dryer air at a higher density, which improves compressor efficiency by about 3%.
  - Turning off idling compressors can save 20–70% of their full load power.
- Efficiency has benefits: 90% of the electricity used to generate compressed air is lost as heat through the compressor cooling air – you can recover 90% of that heat for other uses.
- Compressed air leaking through one 4 mm hole costs over £500 a year. (Estimate the cost of leaks using the table below.)

Air Pressure, bar	Size of leak			
	2mm £/year	3mm £/year	4mm £/year	5mm £/year
4	51	247	407	719
5	58	277	462	781
6	62	304	514	822
7	62	314	561	863

Practical steps to make your air compressor system more efficient

Every site's action planning will differ. Please consider the steps below as a suggested route and adapt the actions under each step to your site's specific needs.

Step 1: Determine current compressor costs and usage, and estimate energy savings.

- Find out the annual cost of compressed air on your site by calculating compressor run time using metering where available.
  - Use the following calculation: Compressor's Annual Energy Consumption [kWh] = Compressor Power Rate [kW] * (annual on-load hours + (annual off-load hours * 0.2)) [hrs]
    A compressor will consume about 20% of its nominal power when it runs off-load (idling).
  - Use hours-run meters. These meters can differentiate between time spent running on-load and off-load. This can be very useful for identifying consumption trends on compressors.
    If the on-load hours are much less than the run-hours it indicates excessive idling.
    Modern packaged compressors commonly have an hours-run meter built in.
- Estimate your potential energy savings as about 30% of this cost.

Step 2: Take action to ensure optimum use of your compressor system.

- Consider alternatives to compressed air.
  - List your main users of compressed air, e.g., loading doors, solenoid valves, and how much air they actually require.
  - Install local air blowers if relatively low pressures are required.
  - Install a smaller compressor unit if only small, infrequent quantities of compressed air are needed.
- Minimise compressor use.
  - Check that compressors are switched off at the earliest opportunity and do not get switched on earlier than necessary.
  - Measure on-load hours and compare on-load hours against total run-hours to check for idle running.
  - Use an on-load/off-load or start/stop control.
  - Consider the option of fitting a variable or dual speed drive on the compressor.
- Watch your pressure.
  - Reduce system pressure to the minimum required.
  - Control pressure at the point of critical demand, not necessarily at the compressor.
- Control the air going in and out of the compressor.
  - Divert air intake to draw air from the nearest outdoor point.
  - Divert compressor cooling air outside the compressor house, or to where heat is required, e.g., to a control room to take the place of an electric heater.

Step 3: Maintain the system.

- Identify and repair compressed air leaks where possible, or report them and schedule a service.
- Leaks reappear, so implement a schedule for checking, repairing and reporting them.
- Replace any clogged filters on your compressor.