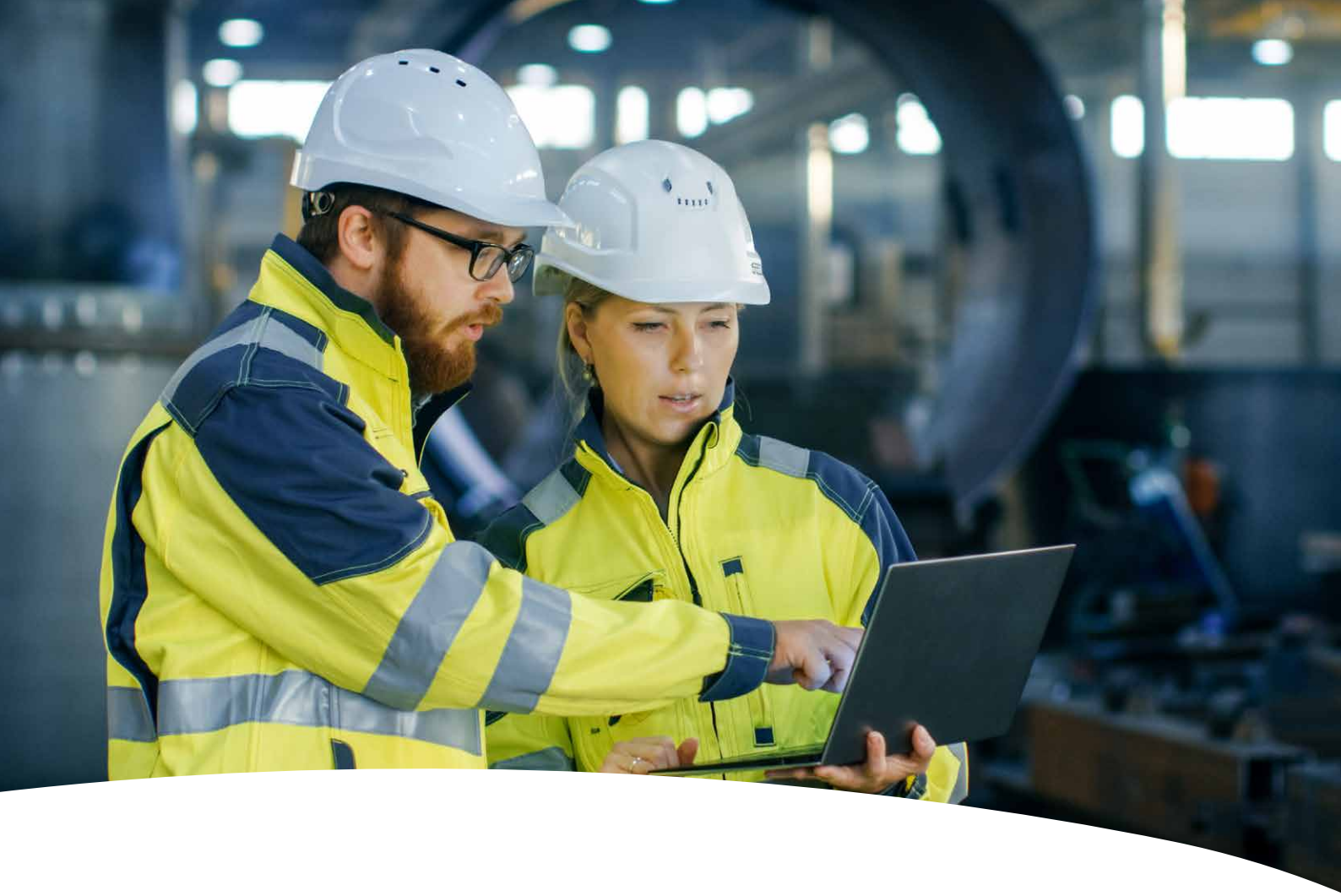
Energy Efficiency Guide

Manufacturing

haven power
A Drax Group company

A better use of energy



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Get smart, save energy

The manufacturing sector, in all of its guises (see right), uses a considerable amount of electricity in terms of refrigeration, power distillation, drying and evaporation units, and compressed air.

However, there are some general ways to cutting back on energy usage.

5 steps to reducing your energy consumption

1. Commit to continuous improvement - involve staff, set goals and track progress
2. Analyse your start point performance, develop benchmarks, and track improvements
3. Set realistic, measurable goals and target dates to see how you're doing
4. Choose the steps you'll take to achieve those goals and involve your employees
5. Implement and measure results, communicating all wins, no matter how small

What do we mean by manufacturing?

When referring to this sector, we're including:

- manufacturers of automobiles
- chemicals
- household goods
- sports equipment
- other durable goods
- jewellery
- food and drink processors
- the makers of other consumable (non-durable) products

How your Manufacturing business can save energy

We've used the Carbon Trust's energy saving reports on **chemicals**, **food and drink processing** and other **guides**, as sources of information for the following suggestions.

These tips highlight areas of consumption that, with improved efficiency, could deliver valuable savings; the amount you recoup depends upon your organisation and your investment.

To help with your budgeting and energy efficiency planning, the tips cover (where possible) three options: no-cost, low-cost, and long-term savings.

No cost

You can make these simple changes quickly - and it won't cost a thing.

Low cost

For a minimal spend you can soon achieve worthwhile savings - and relatively easily too.

Long-term savings

Make a more substantial investment now - and you'll see the returns over time

Heating

No-cost changes

- Regularly check boilers to ensure no faults - servicing your gas boiler once a year and oil boiler twice a year can save you up to 10% on heating costs
- Reduce thermostats by 1°C - it can lead to an 8% cost saving
- Monitor the steam distribution network for leaks or other issues (10% of the heat produced by steam boilers can be lost through inefficient insulation)

Low-cost changes

- If you're in chemicals, consider pre-heating the combustion air using flue gases or exhaust fumes - if combustion air reaches 20°C, there should be a 1% improvement in boiler efficiency

Long-term savings

- Consider using automatic controls/isolation to meet demand at varying rates of heat
- If your heating needs vary, consider using several smaller boilers to match demand
- Fit economisers/heat exchangers to the flue gas outlet - will transfer heat from the gas to the water feeding the boiler, reducing the energy needed to heat the water
- Control flow of combustion air with variable speed drive fans rather than dampers
- Isolate pipework that's no longer in use to prevent unnecessary heat loss
- If you have hard water, an automatic treatment system can save 2% of energy use

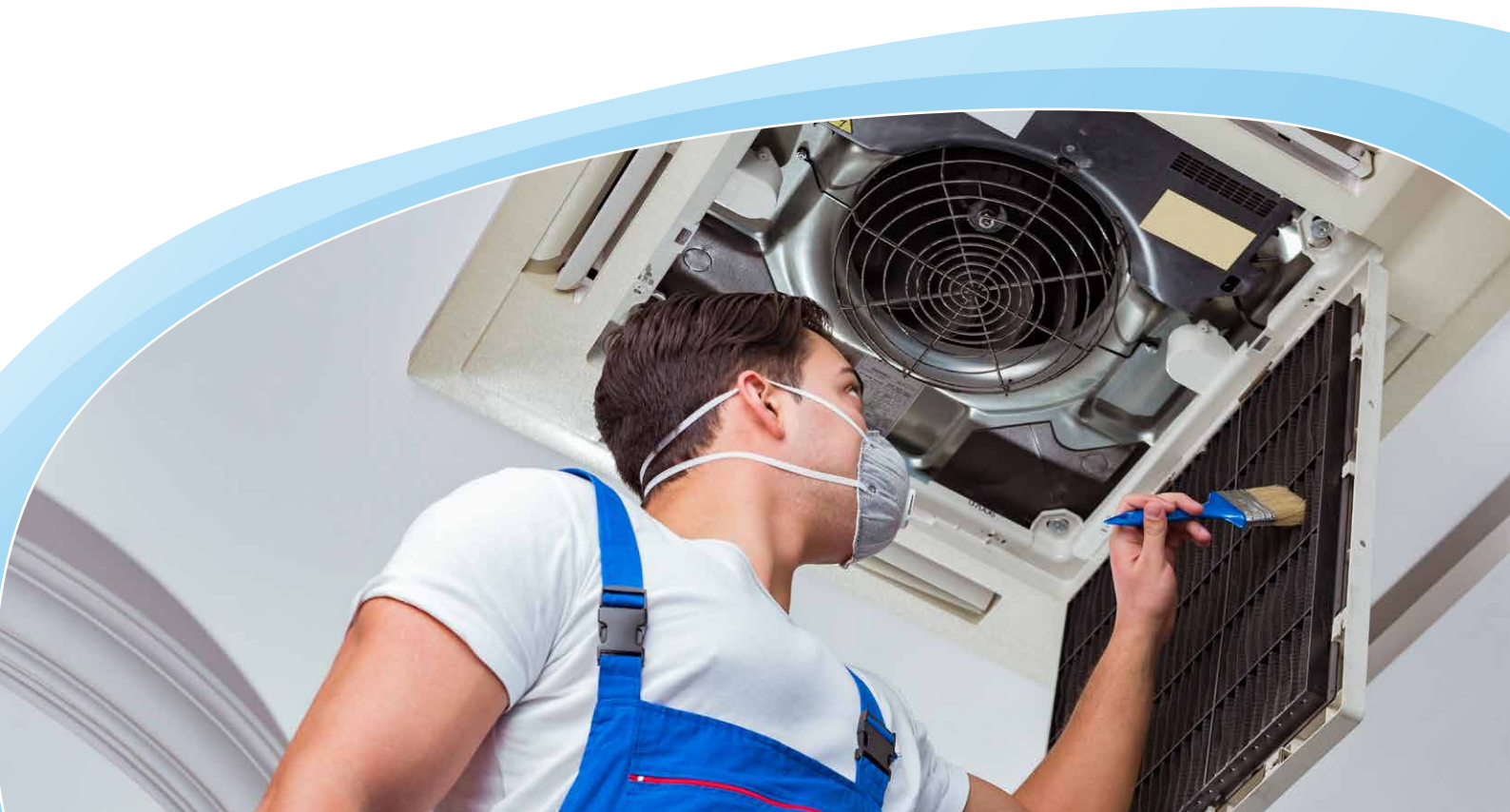
Ventilation/air conditioning (VAC)

No-cost changes

- Check that extraction fans and ventilation devices aren't left running unnecessarily (despite its small baseload, an extractor increases the need for heat by around 5%)
- Minimise AC use by minimising sources of unexpected heat (e.g. office equipment left on when not in use; artificial lighting when daylight available)
- Adopt a temperature range (e.g. 19 - 24 °C) when heating and cooling are both off

Long-term savings

- Consider interlocked control with time switches and sensors - will automatically turn off ventilation when specific equipment is turned off
- Look for energy efficient fans and ignore the upfront cost when making the decision



Lighting

No-cost changes

- Avoid leaving lights on - especially when daylight is available - and label switches, so people feel confident they're turning off the right thing
- Move people closer to daylight and have blinds open during the day
- Keep windows, skylights and light fittings clean

Low-cost changes

- Use timers to automatically match working hours and/or occupancy to the lighting
- See the Energy Saving Trust report: "The right light - selecting low energy lighting"

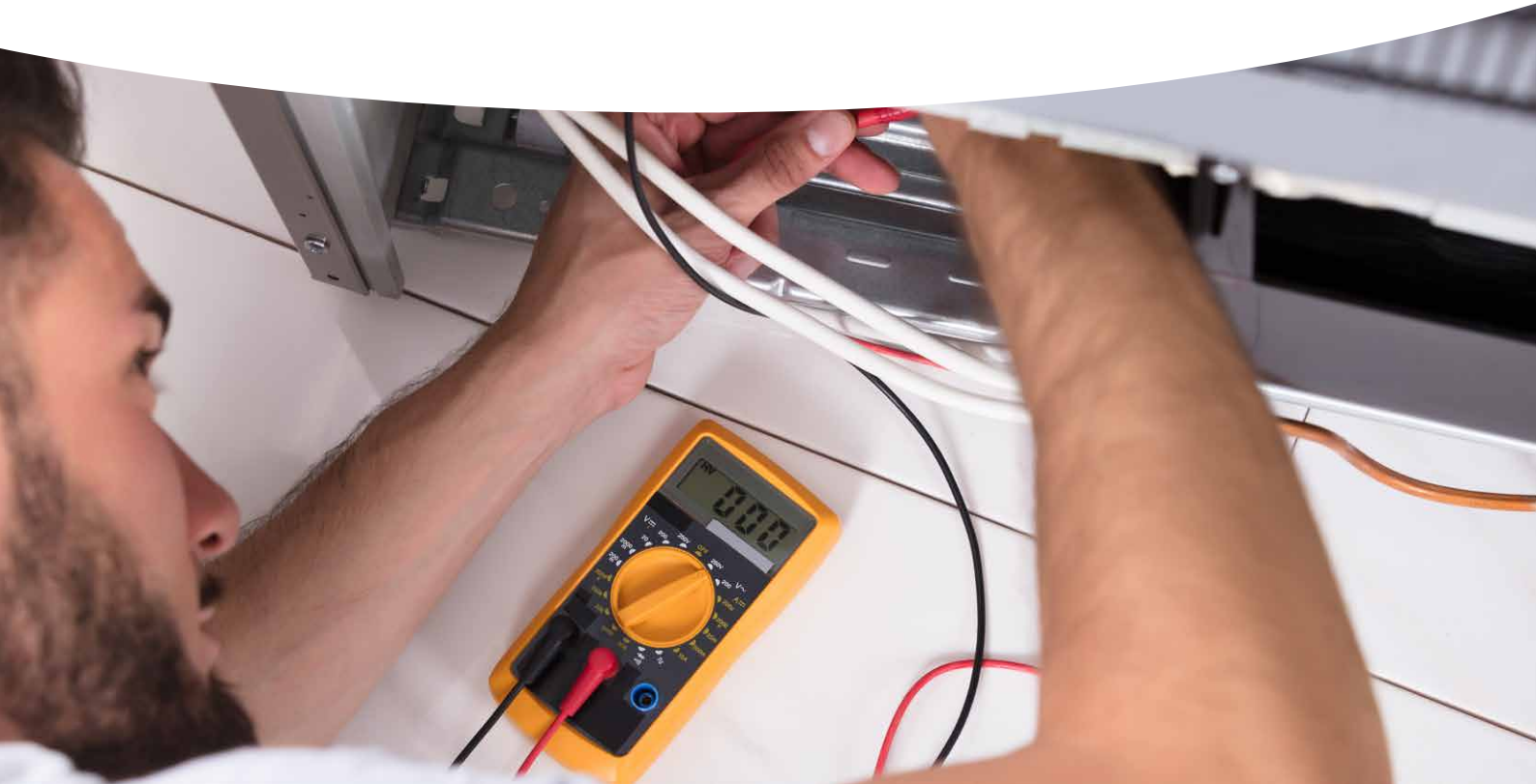
Refrigeration

No-cost changes

- Introduce a maintenance programme (checking for scaling, ice build-up, damaged vent fins) and, if you can see bubbles in the refrigerant, fix the leaks as soon as possible
- Make sure the pipe insulation is in good condition, and seals are sound too
- Don't overload the refrigeration systems - it makes the system work too hard to maintain the temperature - and don't run it too empty either, as it's wasteful
- Don't overcool - every 1° C warmer can save 2 - 4% of costs - so check the correct temperature for whatever you're storing
- Keep doors closed whenever possible - they can account for up to a 30% increase in heat load (ice build-up is a sign that too many air changes occur)

Long-term savings

- If your output varies, use two (or more) smaller refrigeration units rather than one large one and turn off any unused equipment



Compressed air

No-cost changes

- Identify whether compressed air is really needed in tasks where it's used (e.g. could air blown from a fan do the job more cheaply?)
- Switch it off – an idle compressor uses 40% of its full load. Despite the high cost of production, many systems waste around 30% of the compressed air through leaks, poor maintenance, misapplication and poor control

Low-cost changes

- If parts of the system (e.g. pipework for the compressor line) aren't needed, isolate them to reduce waste
- Use cool air to reduce load on compressor – a 4°C drop increases efficiency by 1%

Motors and drives

No-cost changes

- Switch off motors when they're not required, rather than keeping them idle
- Lowering a motor's speed by just 20% can save up to 50% energy

Low-cost changes

- Maintain motor systems (e.g. regular cleaning and lubrication, plus checks for belt tension and alignment) to save up to 10%

Long-term savings

- If motors are too big for what's required, consider installing smaller, more efficient replacements
- When a motor fails, replace it with a higher efficiency motor (between 2% and 5% more efficient) or install variable speed drives (up to 30% more efficient)

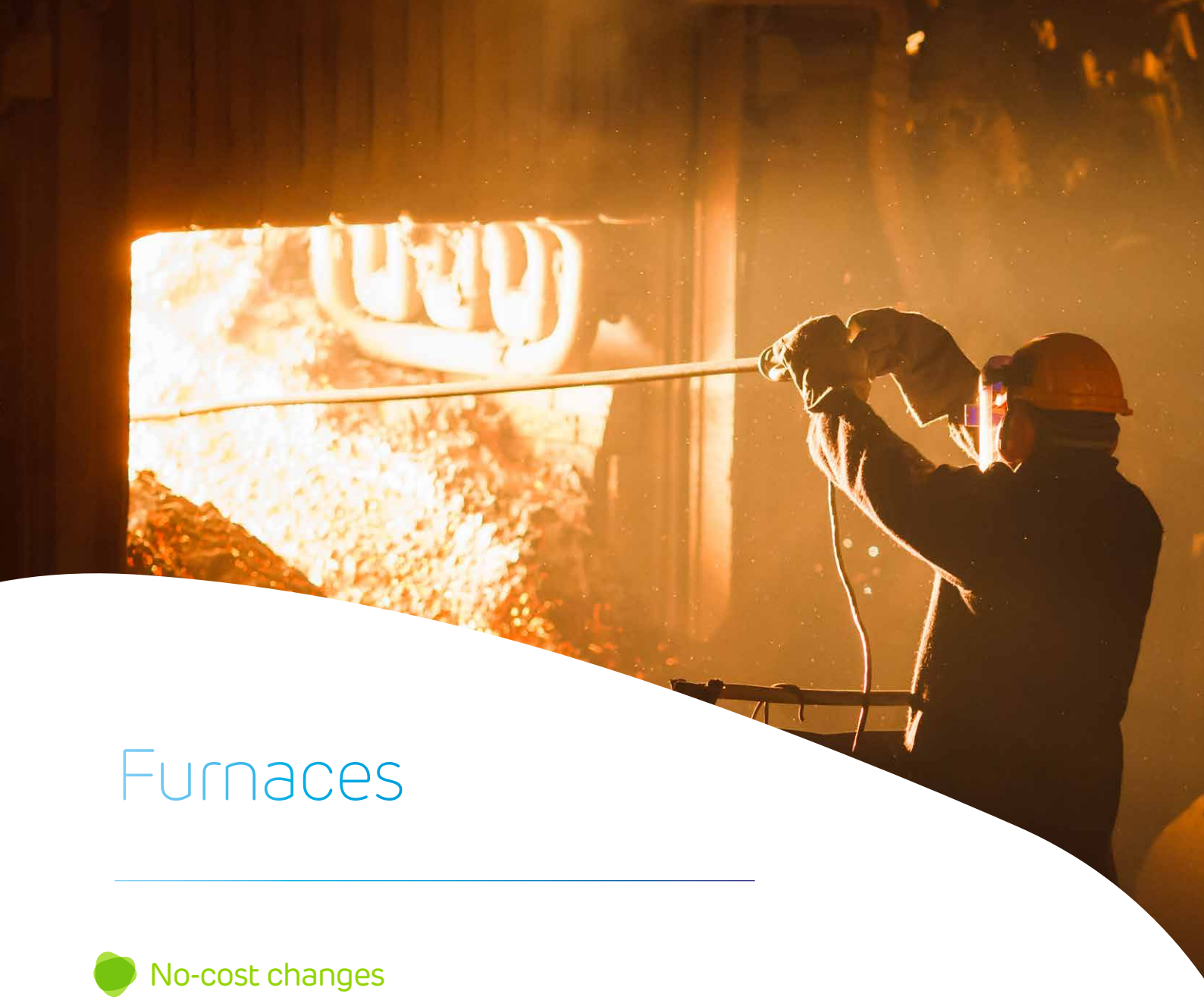
Distillation, drying and evaporation

No-cost changes

- Check whether you could re-use waste heat somewhere else on site
- Regularly check product yield against energy use - anomalies indicate problems
- Can you use less water in initial stages of production, or use alternative techniques such as centrifugation, to reduce amount of water before the drying stage?

Long-term savings

- Insulate equipment – these processes often suffer from a loss of insulation
- Consider reduced pressure distillation, since it uses lower temperatures



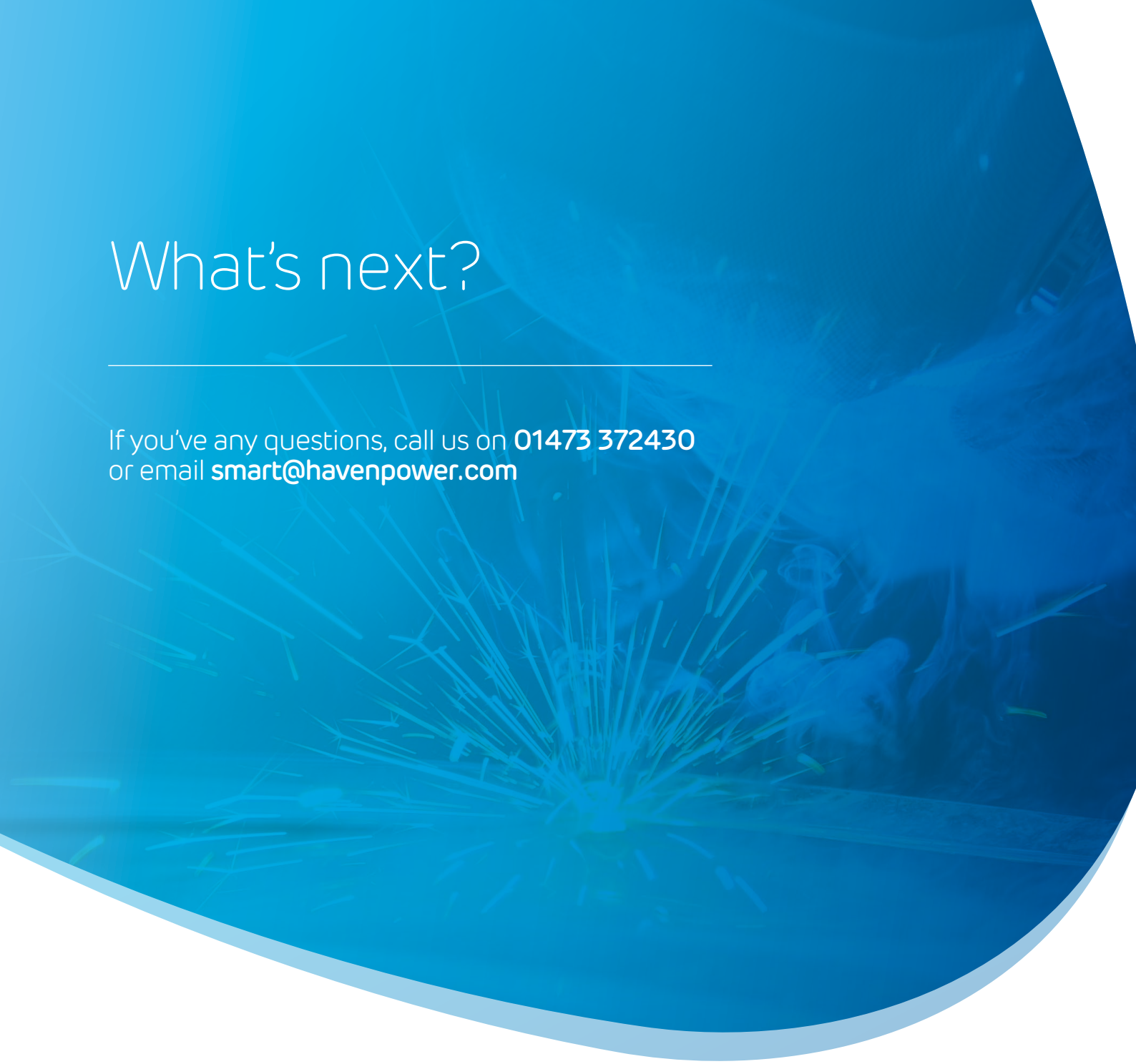
Furnaces

No-cost changes

- Record furnace performance daily (check against manufacturer recommendations) by looking at the ratio of energy use and yield - deviations highlight problems or opportunities to improve yield with the same energy input
- Explore whether you can charge and unload the furnace differently to improve output, or whether you could invest in a more efficient burner

Low-cost changes

- Find out what variables to monitor to control the quality and emissions of the furnace
- Maintain regularly and check air/fuel ratio for correct combustion versus fuel consumption



What's next?

If you've any questions, call us on **01473 372430**
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A better use of energy

www.havenpower.com