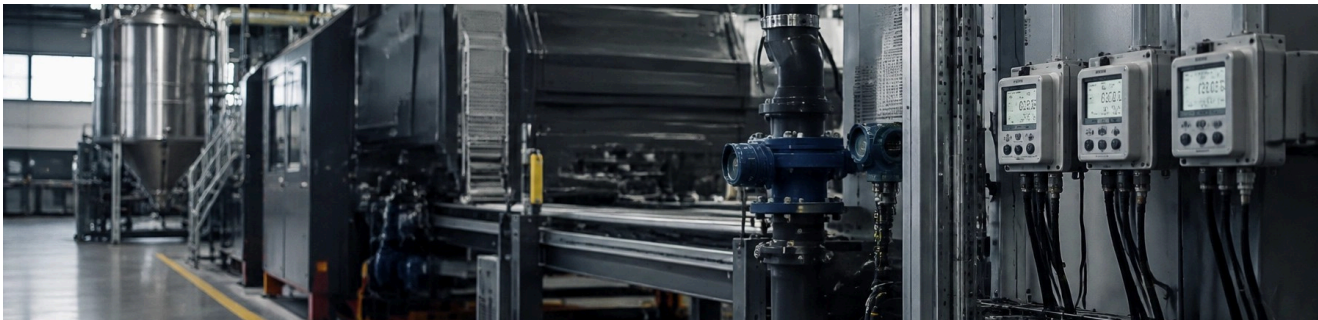


Motors, drives and controls

Where most of a factory's electricity actually goes



If your site runs pumps, fans, compressors, conveyors or mixers, motor-driven systems are very likely your largest electrical load. Industry guidance, including the Carbon Trust's work on motor systems, has long pointed to motor-driven systems accounting for around two thirds of industrial electricity consumption. That makes them the natural place to look once the obvious quick wins are done.

Where the waste hides

Pattern	What's happening
Throttled control	A pump or fan controlled by a damper or valve: the motor runs flat out and the system throws away the difference whenever output is turned down.
Oversized motors	Motors specified for a duty that never happens run inefficiently at low load. Size and duty drift over decades of plant changes.
Old efficiency classes	Motors repaired or replaced over the years may be older, less efficient classes. Minimum efficiency standards now apply to new motors sold in Great Britain. Check the class before accepting like-for-like swaps (IE3 minimum for most three-phase motors, IE4 for some 75 to 200 kW units since July 2023).
No-load running	Motors, fans and pumps left running through breaks, changeovers and out-of-hours periods, clearly visible in half-hourly data.

Variable speed drives: the high-payback measure

For centrifugal fans and pumps, slowing the motor to match demand cuts energy use sharply, because the power needed falls steeply as speed reduces. Where a fan or pump spends long periods throttled or dampered, a variable speed drive is often one of the fastest-payback electrical measures available.

But survey before you specify

Savings are site-specific and depend entirely on the load profile. The same drive on a constant-duty motor can add losses rather than save money. Evidence first: a week of logged data on a candidate motor tells you whether a drive will pay back in months or never.

Evidence first: log the load before you buy. Clamp-meter a candidate motor for a week, compare running hours against your half-hourly data, and only then get quotes.

Practical checks

- Walk the site with a clamp meter: log duty, load factor and running hours on the biggest motors first
- Match half-hourly data against running hours to find motors running when the process is not
- Check throttling: dampers partly closed, valves bypassing, recirculation loops
- Prioritise drives where flow genuinely varies and the motor is a significant size
- Consider high-efficiency motors at replacement; check the efficiency class before accepting like-for-like swaps
- Watch for multiple motors doing one job: parallel pumps and fans are common sites for savings

Worked example (illustrative): a 22 kW fan running 5,000 hours a year, dampered back to 70% flow for most of that time. Fitting a drive to match fan speed to demand could cut that motor's electricity by around 30% in a case like this, call it 33,000 kWh. At 25p/kWh, that is around £8,000 a year before levies. The exact number doesn't matter; the point is that one throttled fan can pay for its own survey. Your real numbers come from a week of logged data.

Where this fits the bigger picture

Motor work sits behind the monitoring-first principle: your half-hourly data shows which motors never stop, the survey shows which of those are throttled or oversized, and the drives follow the evidence rather than the catalogue. It is also one of the measures an ESOS audit should surface with real numbers attached, so any motor project you do this year becomes evidence for the next compliance cycle.

Remember: the cheapest source of capital is the energy you are wasting.



About Hawley Energy

Hawley Energy is an independent energy consultancy based in West Yorkshire. We turn energy compliance pressure into measurable progress: data analytics and reporting (Enerlyse), transparent procurement (Baseline Power), coordinated project delivery and flexible financing (PowerPacks), with one point of contact and complete accountability. Certified to ISO 9001, ISO 14001 and ISO 45001, and led by a CIBSE-accredited ESOS Lead Assessor, we replace guesswork with evidence-driven insight. The cheapest source of capital is the energy you are wasting.

Talk it through: no pressure

Andrew Hawley · hello@hawleyenergy.co.uk · 01484 958761
30-minute call · I love a challenge



Sources: Carbon Trust guidance on motor systems and variable speed drives; GB Ecodesign Regulations 2021 motor efficiency requirements. Savings are indicative and site-specific; survey before specifying.
A Hawley Energy session resource, part of the free WYMS manufacturer pack at hawleyenergy.co.uk/wyms. Last verified: 20 October 2026.