

Compressed Air System Optimisation

Canonical: <https://northmoregordon.com/technologies/compressed-air-optimisation/>

Details:

Required service · Demand side · Supply side · Measurement · Project sequence

Compressed air is convenient but expensive to produce, and waste can be hidden across the compressor room, distribution network and end uses. Northmore Gordon assesses the whole system before recommending new capacity. The work can include leak surveys, pressure and power profiling, flow measurement, control review, system benchmarking and option development.

The original page reports experience benchmarking more than 30 compressed-air systems. Site results vary with production, compressor mix, pressure, leaks, controls and operating hours, so universal percentage savings should not be used as a forecast.

Define the required service

List which processes need compressed air, the required pressure and air quality at critical users, flow profile, operating shifts and reliability requirement. Record compressor capacities, dryers, receivers, controls, distribution pressure and available metering. This prevents the current supply arrangement from being mistaken for the actual service need.

Reduce avoidable demand

survey and prioritise leaks, including during shutdown or low-production periods;

replace inappropriate compressed-air uses where a fan, blower or electric tool is more suitable;

remove artificial demand caused by excessive system pressure;

reduce distribution losses and address poorly sized piping or restrictions; and

isolate idle equipment and zones when production is stopped.

Repair leaks before sizing replacement capacity. Otherwise a new compressor may be selected to supply demand that should have been removed.

Optimise generation, sequencing and pressure

Assess the complete compressor group across its operating range. Controls and sequencing should minimise unloaded or inefficient operation while maintaining pressure at the critical user. Dryer performance, receivers, cooling, maintenance and system response all affect the result.

Pressure should be based on the service requirement plus justified distribution losses. An arbitrary high setpoint increases demand across the system and may hide restrictions that should be corrected.

Collect evidence that answers the decision

| Measurement | Question answered | | --- | --- | | Power profile | How compressors load, unload and sequence over the operating cycle | | Flow profile | How demand changes by shift, process or shutdown | | Pressure logging | Whether critical users are served and where losses occur | | Leak survey | Where unintended air loss exists and how it should be prioritised | | Production data | Whether energy changes reflect output rather than system performance |

Match the monitoring period to representative operations. Specify meter type, installation, units, timestamps and quality checks so the analysis can be reproduced.

Sequence decisions and avoid double-counting

Confirm service and data quality.

Remove inappropriate uses and repair leaks.

Optimise pressure, distribution and sequencing.

Reassess the remaining demand and redundancy requirement.

Only then compare compressor, dryer, receiver or piping investments.

Use measurement and verification to confirm implemented results.

If leak repair and compressor replacement are both proposed, assess the replacement against post-repair demand. The same original load cannot support two independent savings estimates.

See the hidden cost of compressed air , utility benchmarking and compressed-air programme information .

Contact Northmore Gordon with compressor details, operating schedules, recent electricity data, pressure issues and the decision the assessment must support.

What should a business assess before deciding to buy additional compressed air capacity?

Begin by understanding the required service: which tasks need compressed air, at what pressure and quality, and during which operating periods. Record compressor capacities and controls, production shifts, required pressure at critical users, and available energy/pressure data. Identify which plant areas remain connected during shutdowns. Government guidance identifies unnecessary uses, leaks, idling, pressure settings and compressor sequencing as investigation areas. A compressor purchase should follow this assessment rather than define it, avoiding the risk of investing in capacity that addresses avoidable waste rather than genuine demand.

How can businesses avoid overestimating savings when proposing multiple compressed air improvements?

Document the sequence and assessment boundary for each improvement to prevent double-counting. For example, if both leak repair and compressor replacement are proposed, the replacement should be assessed against the demand expected after leaks are repaired. Adding two estimates that each assume the original full load can overstate the combined result. Request a description of operating scenarios, measured evidence, proposed changes, and assumptions used in financial comparison. Include a plan to confirm performance after implementation, particularly where production changes could obscure results.

What information should be included in a compressed air system assessment request?

Request a description of operating scenarios, the measured evidence, proposed changes and assumptions used in financial comparison. Ask for a plan to confirm performance after implementation, particularly where production changes could obscure the result. For certificate support, assess the specific site and scheme method separately, as an energy-saving opportunity does not automatically establish the evidence standard, timing or eligible quantity for a certificate claim. The report should explain how different measurement methods (leak surveys and power profiles) combine to build understanding rather than relying on either alone.

What is the relationship between pressure settings and compressed air system efficiency?

Pressure settings significantly affect system efficiency and must align with critical user requirements. The relevant question is: what pressure is actually required at critical users, including accounting for system pressure losses in the distribution piping between compressor discharge and end-use points? Optimisation involves adjusting pressure to the minimum necessary for production tasks while maintaining required operational standards. This requires understanding which parts of the plant are critical users with specific pressure demands, versus areas where excessive pressure creates artificial demand and waste.

How does Northmore Gordon help businesses compare compressed air optimisation options?

We recommend using a common basis to compare options: reduce unnecessary demand (can production tasks still be performed to required standards?); repair leaks (what evidence shows the effect under comparable operations?); change sequencing or controls (how does the compressor group respond across our operating range?); adjust pressure (what is required at critical users, including pressure losses?); replace a compressor (what demand remains after other feasible changes?). These questions form a commissioning brief. Actual settings and equipment selection require the responsible technical team's assessment, allowing informed comparison across alternatives.

What role does measurement and verification play in compressed air optimisation projects?

Measurement and verification establishes baseline conditions, measures actual operating variables, and demonstrates energy savings from implemented changes. For compressed air systems, this requires specifying measurement boundaries, recording what was installed and when it was commissioned, and tracking relevant operating variables to explain performance changes. A useful M&V brief identifies the purpose (internal performance, investment contract, or certificate scheme), boundary, baseline conditions, measurement instruments and intervals, implementation records, and reporting methodology. This separates engineering estimates from verified operating results and supports credible claims about project outcomes.

Why is understanding operating conditions important for compressed air system assessment?

Operating conditions directly affect whether an identified opportunity is genuinely achievable and economically worthwhile. A leak survey and a power profile answer different questions; combining evidence rather than assuming one describes the entire system produces more reliable analysis. The same compressed air system may have different optimization priorities when operating one shift versus three shifts, or if production throughput changes. Asking whether a proposed solution remains beneficial under plausible changes in operating hours, energy price, and production volume helps distinguish measures that stand alone from those affected by operating context.

What is Northmore Gordon's experience with compressed air system assessment?

We have benchmarked the performance of over 30 compressed air systems, offering power versus flow measurement and benchmarking, specification and verification of meter readings (including meter type and installation), and comparison to best-practice and reference sites. This practical experience informs understanding of how different system configurations, control strategies, and operating conditions affect energy consumption. The company can help businesses understand whether their system performance is typical, identify where optimization is most likely to be effective, and assess whether proposed changes are likely to deliver credible savings.