

TECHNICAL BRIEF

Technical Brief - Sustainability

Sustainability is a very common word these days. It is used to describe a practice that can be maintained at a certain level without depleting the resources it depends on. Another dictionary meaning of *sustainable* is something that can be upheld or defended. The current popular usage applies both these concepts to natural resources consumed by, and the environmental impact of, human activities –both as consumers and in our business practices.

There is a distinctly moral or ethical overtone to *sustainable* that reflects the public’s expectation that businesses should be economical in consuming resources, particularly natural resources and energy. Of course, much energy is derived from natural resources, but in addition to the concern for the future cost and availability of coal, oil, and natural gas there is concern about the by-products from the conversion of these resources to energy—i.e. the carbon foot print.

Generating compressed air requires plenty of resources. To combat this, many compressor manufacturers have improved equipment designs to use less consumable maintenance items and/or have extended service intervals. Specific examples include:

- The development of more advanced compressor lubricants/fluids that last longer to reduce the frequency of replacement and total volume of fluid disposed.
- Designing equipment to use less of these fluids without compromising lubrication and cooling functions.
- Adopting new materials and designs for other consumables such as filters that facilitate recycling.

These improvements have reduced the waste stream from preventive maintenance on compressed air systems. They have also reduced the consumption of resources associated with manufacturing, transporting, and storing these items.

Energy Presents the Biggest Opportunities

But compressed air’s energy consumption represents an even larger sustainability challenge. Compressors are inherently energy intensive and nearly all the input energy is converted to heat. Further, there are compressor installations where equipment is misapplied and improperly sized. Some of these are the result of changes in a factory's compressed air demands. In the past, efficiency was usually overlooked, as energy was a relatively minor cost component and reliability trumped all other considerations.

Fortunately, there is a concerted effort to address these issues. Compressor manufacturers, distributors, utility companies, energy service companies, and government agencies are all playing a role in helping end users increase energy efficiency through a combination of factors including:

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- Raising awareness about the extent of energy wasted in compressed air.
- Designing compressors and air system components to be more efficient.
- Educating industry professionals, end users, and consultants on best practices in air system design.
- Conducting detailed system audits to map current demand profiles and identify inefficiencies.
- Incentivizing equipment upgrades to more efficient products.
- Installing better controls that manage systems and provide usage data.
- Capturing waste heat for use in a variety of HVAC and process heating applications that present tremendous savings opportunities.

The Compressed Air and Gas Institute and its members always recommend a compressed air system assessment or audit to best understand the current system performance, identify opportunity to reduce energy consumption, improve system performance, and fully understand the balance between the compressor room supply side and operation's true demand for compressed air.