



Commercial Industrial Solutions

Unleashing Energy & Cost Savings with Compressed Air as a Service (CAaaS)

Executive Summary

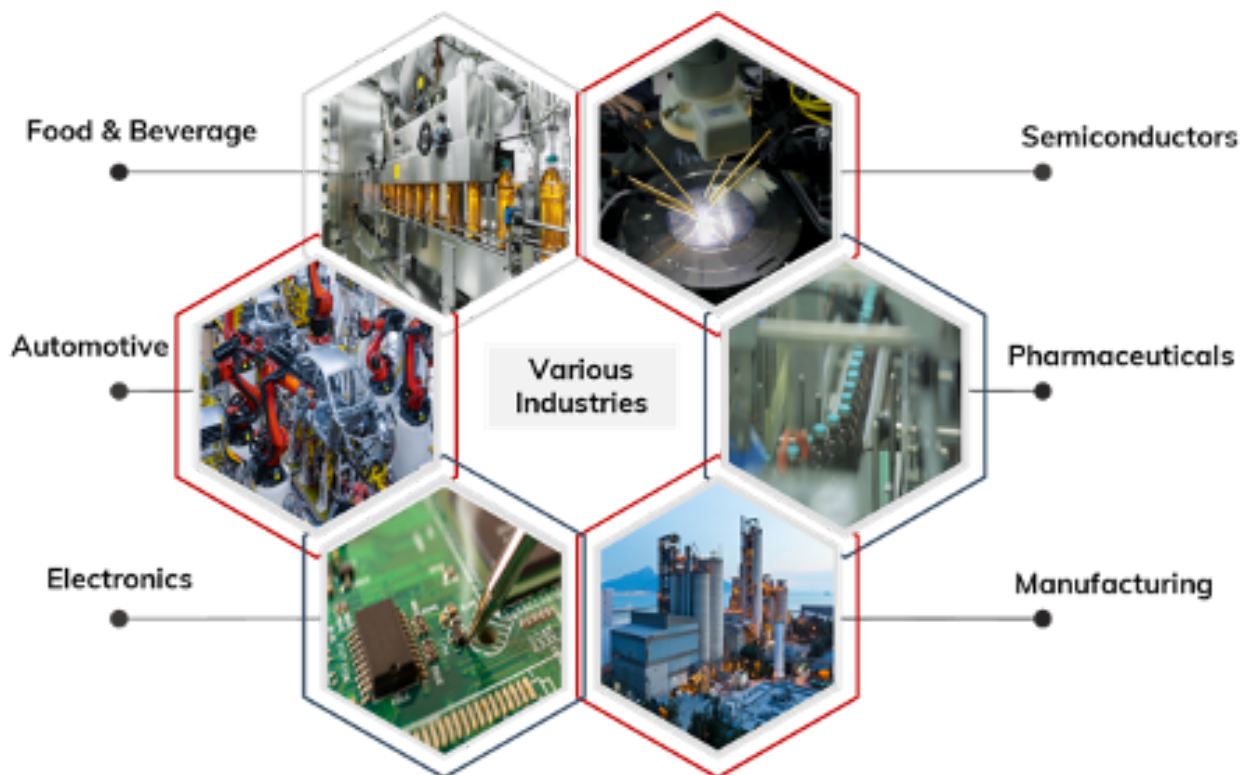
This white paper focuses on the transformative potential of Compressed Air as a Service (CAaaS) in the context of energy and cost savings. CAaaS presents a novel approach to compressed air provision, emphasizing efficiency and reducing the financial burden of traditional compressed air systems. This paper explores the energy and cost-saving benefits of CAaaS and offers insights into successful implementations.

Introduction

Compressed air is a vital utility in numerous industries, yet its production and maintenance are associated with substantial energy consumption and operational costs. The emergence of Compressed Air as a Service (CAaaS) has introduced an innovative model that shifts the responsibility of compressed air supply, operation, and maintenance, unlocking unparalleled energy efficiency and cost savings.

The Compressed Air Industry

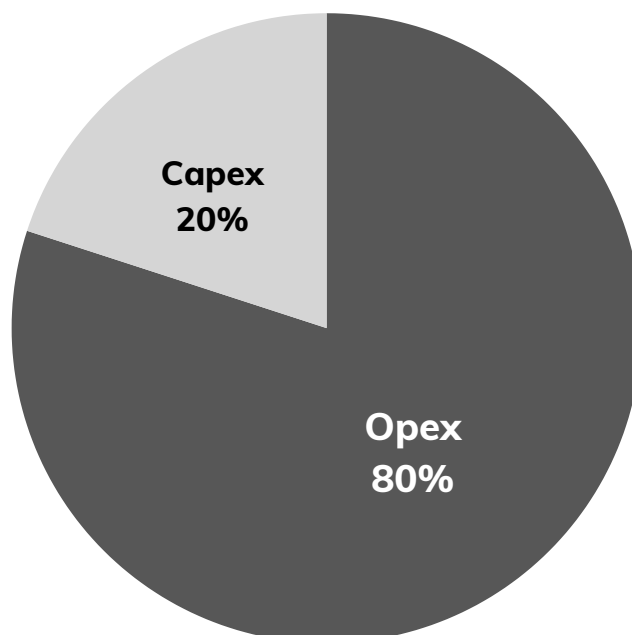
The global compressed air industry, valued at over \$30 billion annually, plays a crucial role in supporting industrial processes. Traditional compressed air systems comprise compressors, dryers, filters, and distribution networks, which often strain energy resources and budgets.



The Energy & Cost Challenge

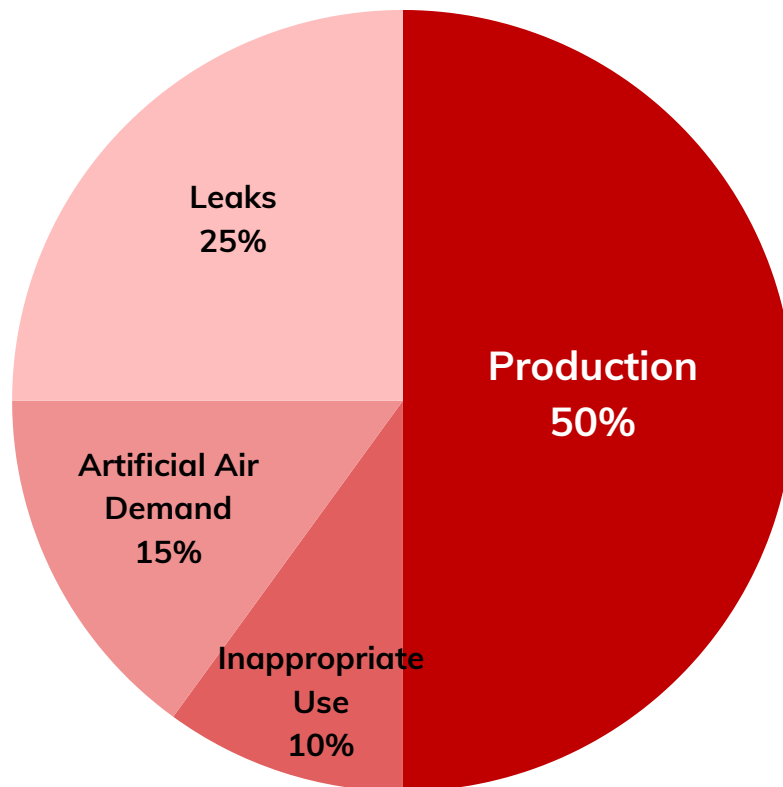
The production of compressed air consumes a significant portion of industrial energy. The associated costs encompass equipment purchase, maintenance, and energy consumption, making compressed air a substantial financial and environmental concern for businesses. Surprisingly the total cost of ownership is dominated by operational expenses of up to 80%.

TOTAL COST OF OWNERSHIP%



Due to various operational challenges only about 50% of the operational costs are being used for production of compressed air.

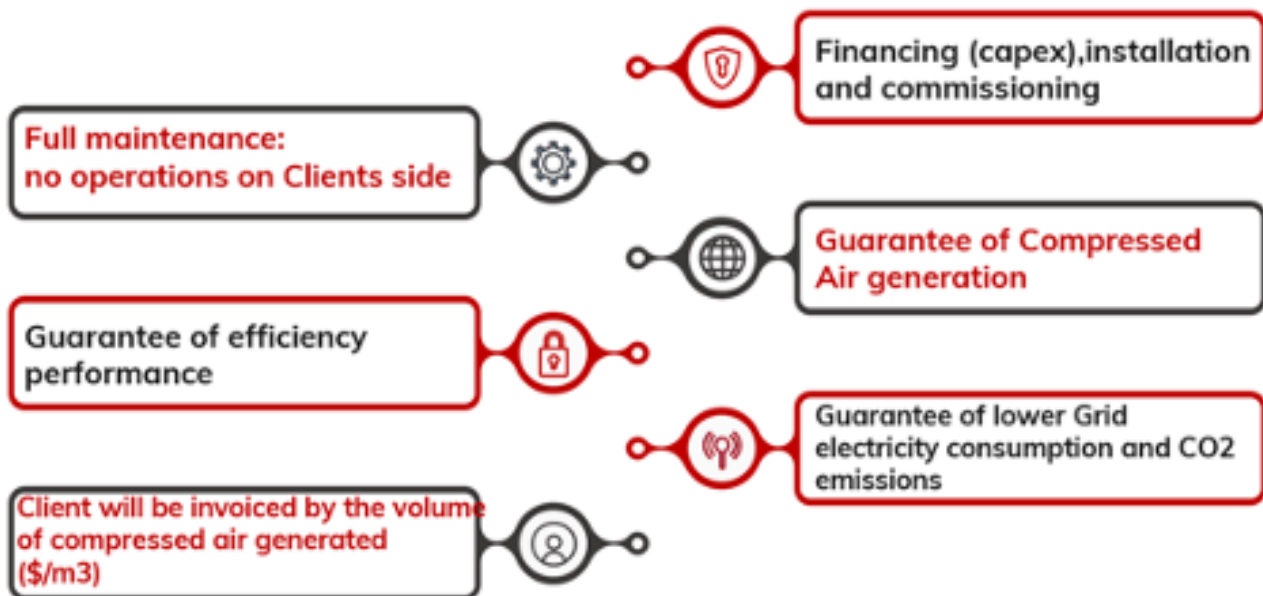
With most installations, only 50% of the air that you pay for gets used for production



This creates a huge challenge for costs and energy consumption but on the other hand provides an opportunity for energy efficiency and cost improvements

Compressed Air as a Service (CAaaS)

CAaaS is a subscription-based model where service providers design, install, operate, and maintain compressed air systems for end-users. This model is designed to optimize energy efficiency and cost-effectiveness while delivering reliable compressed air. Key features include:



Maximizing Energy Efficiency

CAaaS providers focus on deploying energy-efficient equipment and optimizing system performance. By reducing energy wastage, CAaaS lowers both energy consumption and associated costs

How CAaaS can reduce energy consumption and emissions

Understanding your air demand-the key to a greener production

Factors for consideration in contro; selection

- Air volume
- Compressed air demand pattern
- Stored system Volume
- Required pressure

Core Technology

- Centrifugal Compressor
- Screw Compressor
- Scroll Compressor
- Oil Free / Oil Lubricated compressor

Why an ER energy recovery unit?

- Reduce energy consumption
- BECIS energy recovery systems allows you to reuse this thermal energy in other industrial processes that require heat or steam (Boilers & Heat Pumps)

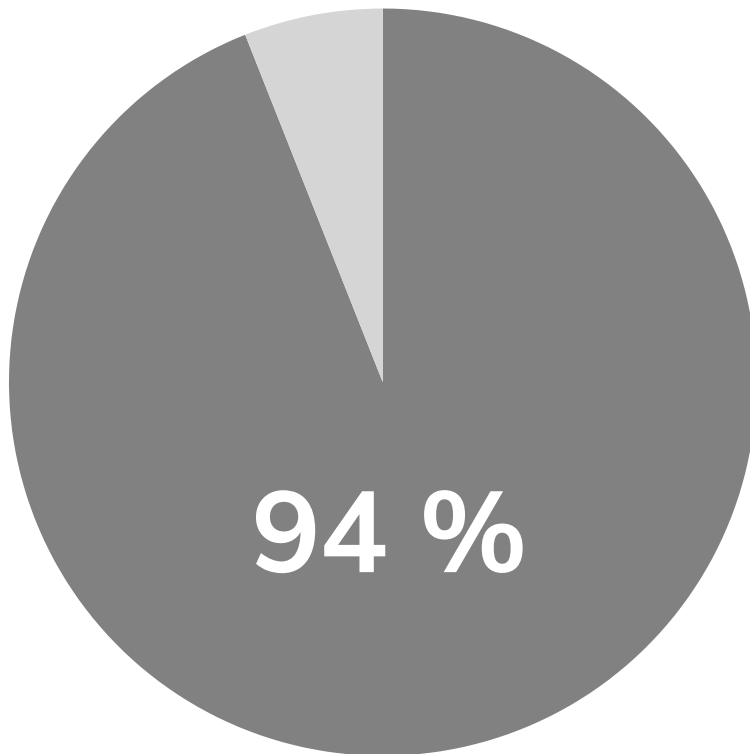
Unlocking Cost Savings

CAaaS eliminates capital expenditures on equipment and shifts the financial burden from ownership to usage. Customers pay for the compressed air they consume, leading to significant cost savings.

Compressed Air and Waste Heat Recovery

Cooling towers are an unambiguous sign of available waste heat potential and are a common sight in compressed air plants. Rather than wasting this valuable resource which comes at low temperatures, it can be utilized by feeding the waste heat to a heat pump raising it to higher temperature levels to provide hot water to industrial processes. The waste heat allows the heat pump to reach higher and thus more valuable temperature levels with less energy consumption due to its high coefficient of performance. Utilizing the waste heat in such a way not only reduces energy consumption but also saves costs for cooling towers and the extensive maintenance for such in the first place.

Large compressor farms can even provide enough energy at higher temperature levels that are able to be utilized to preheat feed water for boilers or run absorption chillers for cooling.



Boiler



Heat Pump

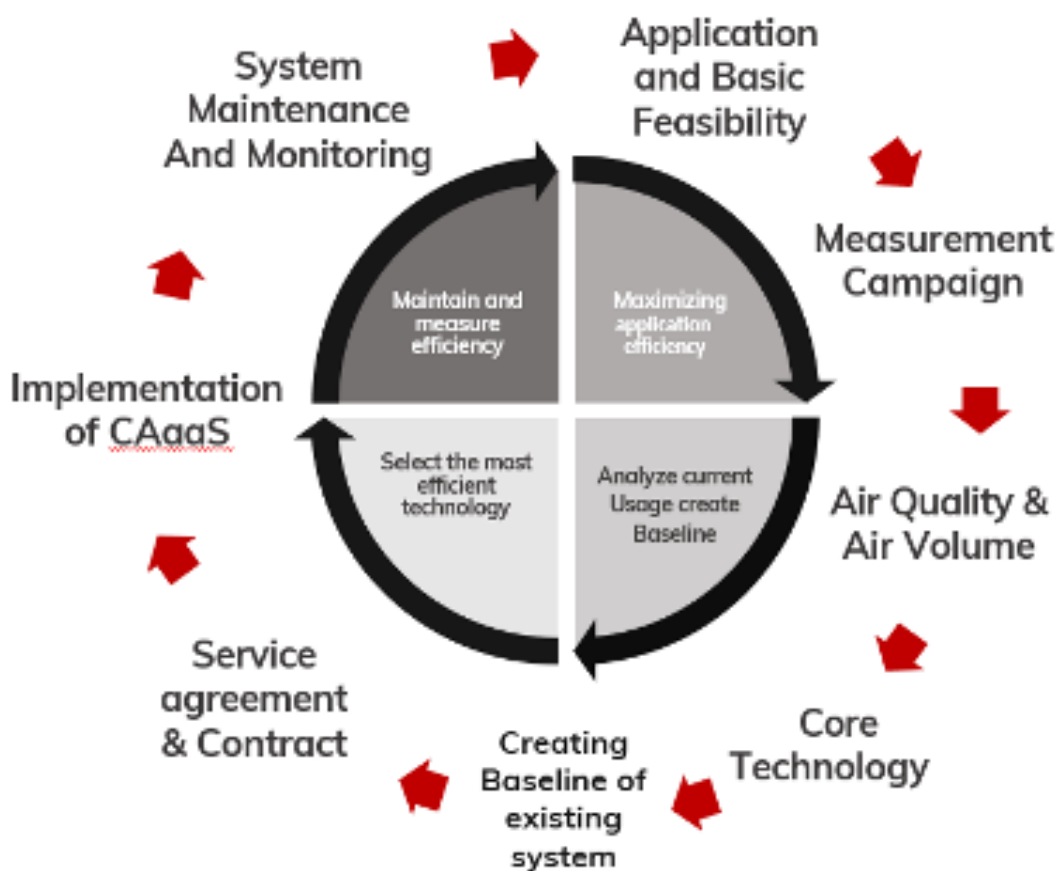
**As 94% of the energy
supplied to the compressor
can be recovered**

Implementing CAaaS: A Path to Efficiency

Transitioning to CAaaS involves a structured process, including:

- **System Assessment:** Evaluating existing compressed air systems to identify energy inefficiencies and cost-heavy areas.
- **Customized Solutions:** Designing tailor-made CAaaS systems to optimize energy efficiency and minimize operational costs.
- **Installation & Integration:** Seamlessly installing new equipment and integrating it into the current infrastructure.
- **Continuous Monitoring & Optimization:** Proactive monitoring and regular maintenance to ensure sustained energy efficiency and cost savings.

Therefore, BECIS always starts with a comprehensive assessment and measurement of the client's compressed air load, the efficiency of the existing compressed air plant and provides a custom tailored design based on client's requirements with state of the art equipment and efficiency. As part of CAaaS BECIS will cover the installation and integration of the new equipment at no cost and take responsibility for the operation and maintenance with a performance guarantee.



Real-World Case Study

Our client, a major manufacturing player in the automotive industry, is striving to reduce its costs and carbon footprint by upgrading and expanding its compressed air plant. The plant has been extended several times without proper planning, while the production demand was growing. This resulted in poor design and furthermore, the equipment is ageing. Some of the machines are not performing as expected hence will need to be replaced.

BECIS has proposed a tailored approach:

We have re-designed the entire compressed air system according to the most recent and forecasted demand, keeping the good machines and installing new ones fit for the purpose, while implementing automated control and taking over the maintenance; this will lead to 561.3 MWh or 24% savings on the energy consumption and reduce the carbon emissions by 430 tons. The overall operational savings reach 70,712 USD per year.

Future Trends

As the CAaaS industry matures, it will continue to evolve, with enhanced technologies and solutions aimed at further improving energy efficiency and cost savings. Prospective trends include advanced predictive maintenance powered by AI, renewable energy integration, and the convergence of utility-as-a-service models for comprehensive cost management.

Conclusion

Compressed Air as a Service (CAaaS) is a groundbreaking solution that not only streamlines compressed air provision but also significantly reduces energy consumption and operating costs. For businesses seeking to optimize their operations and bolster financial efficiency, CAaaS represents a compelling path forward. This white paper has explored the potential of CAaaS in delivering energy and cost savings and provides a comprehensive understanding of its benefits, key market players, and the bright future it offers to industries keen on economic and environmental sustainability. CAaaS is poised to lead the way in revolutionizing compressed air supply and management, ensuring a greener and more financially efficient future for businesses.

Compressed Air as a Service



Savings
w/o Initial Investment



Guaranteed
Compressed Air Supply



Peace of Mind