Enerficiency
Utilizing Drone Technology to Improve Industrial Compressed Air Leak Auditing
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Value Proposition
Enerficiency couples drone technology with its leak detection and management software. This makes it easier and cheaper for energy service providers to acquire and retain industrial customers for compressed air leak detection and repair services. In this way, we facilitate the reduction of energy waste in the industrial sector.

Relevance of Compressed Air
Compressed air is a key utility in industrial manufacturing facilities. 10% of energy in the U.S. industrial sector is used to compress air. This compressed air is used as a pneumatic energy source to operate valves, instruments, and tools. A typical facility contains 1000’s of feet of piping distributing compressed air from the compressor to the various end-users. This network of piping is prone to leaks – air leaks account for 20-30% of energy consumption of compressed air systems in the U.S.

Existing Auditing Process
A technician(s) walks around the manufacturing facility and searches the piping network for leaks.

The technician uses a handheld ultrasonic sensor to listen for and locate leaks with a point-and-aim technique. The technician must listen for leaks using headphones that are attached to the sensor.

Typical Environmental & Financial Impact
Annual financial and environmental impact potential of air leaks at a typical mid-size manufacturing facility:

Financial Impact - $70,000

<table>
<thead>
<tr>
<th>Leak Size</th>
<th># of Leaks</th>
<th>Annual Cost</th>
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<tbody>
<tr>
<td>1/32&quot;</td>
<td>70</td>
<td>$10,710</td>
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<td>1/16&quot;</td>
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<tr>
<td>1/4&quot;</td>
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Environmental Impact - 550 tons CO₂ equivalent

Equivalent to the emission of 117 cars.

Enerficiency’s Auditing Process
A certified drone pilot operates and monitors the drone to search the piping network for leaks.

The drone algorithmically locates and catalogs the leaks using the on-board ultrasonic leak detector and associated analyzer.

Benefits of Enerficiency’s Approach

Time savings – the algorithmic precision of drones allows audits to be completed in a fraction of the time compared to the fuzzy logic of a technician with a handheld detector.

Superior database management – 3D mapping and analytics capabilities of the software better enable development of leak management and repair programs than the traditional spreadsheet style database. Consequently, improving the post-audit implementation rate.

No need for backup – our audit process only requires one person – the pilot. The traditional process requires a facility employee to be present with the technician in order to advise location tag names for the spreadsheet.

Next Steps
Proof of concept - develop a minimum viable product and conduct a mock audit to validate the technical and financial viability of the idea.

Research
We conducted 95 interviews with industry experts, sales and technical staff at existing leak detection service providers, and management personnel at industrial facilities.

Key takeaways:
• Duration and cost of audit are key drivers of customer purchase decision.
• Non-implementation of leak management and repairs following an audit is high due to a variety of economic, financial, and logistical considerations.

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