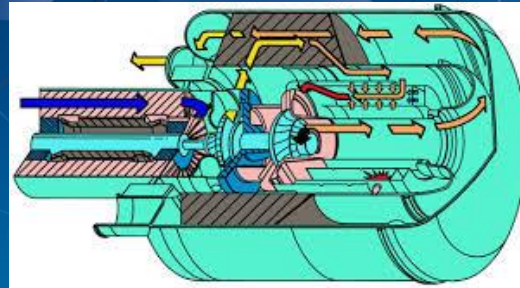


Energy & Power Systems TechVision Opportunity Engine



Microturbines for Transportation and Industry

D961-TV

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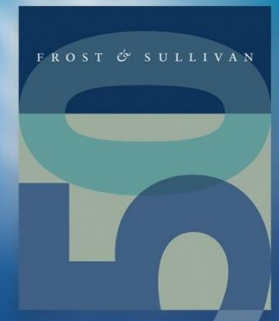


Table of Contents

Section	Slide Numbers
<u>Microturbines in Transportation</u>	3
• Wrightspeed, USA	4
• Bladon Jets , UK	5
• Walmart, USA	6
• Low Emission Turbine Drive, USA	7
Strategic Perspectives	8
Industry Interactions	10
<u>Microturbines in Industry</u>	11
• Capstone, USA	12
• ICRTec, USA – Turbocharge-like Microturbine	13
• Micro Turbine Technology, Netherlands	14
• Harbin Institute of Technology, China	15
Strategic Perspectives	16
Industry Interactions	18

Microturbines in Transportation

Wrightspeed, USA

Fulcrum Range Extenders for Increased Power to Weight Ratio

Problem Statement



- Efficiency of microturbine-powered stop-and-go trucks or of trucks that are required to stop frequently is low compared to IC (internal combustion) powered ones.
- Instead of powering the engines, the generators are used to power the batteries on road. This reduces the need to charge them separately.
- The previous versions of the Route powertrains used Capstone 65kW microturbines to power the gensets. These had a weight-to-power ratio of watts/kg

Innovation Attributes

The microturbine generators have a capacity of -kW. They are used to power the battery packs in the truck.

The constant speed of the microturbine enables up to - times cleaner operation compared to reciprocating engines.

Tech Profile



Who



Where

The Fulcrum range extender was introduced by Wrightspeed Powertrains USA. They have been designed to be incorporated with the Route Powertrains for heavy and medium sized trucks.

What



- The previous microturbines from Capstone had a low power-to-weight capacity ratio and were also heavy.
- The Fulcrum has a better output capacity and lower weight than the Capstone model.
- ...
- ...

- The Fulcrum range extender weighs a mere pounds while its piston counterparts are much heavier.
- It has an operation time of about - hours.
- Able to meet the emission standards without adding extra parts.



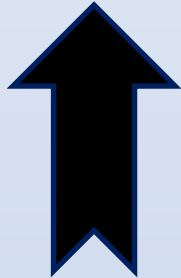
The range extenders for trucks were commercialized on

Strategic Perspectives

Key Trending Markets

Microturbines are being used in high speed and high power vehicles such as long haul trucks. Most microturbine-based projects are either in prototype or in design stages. Very few of the projects have been commercialized or put to use.

Drivers



- ✓ Microturbines provide a cleaner option for power generation.
- ✓ They can be used in both pure electric vehicles and for range extension in hybrid electric vehicles.
- ✓

Restraints



- ✗ Their efficiency is much lower than the internal combustion engines. While turbines are quite efficient, microturbines do not generate enough power to be classified as fuel efficient.
- ✗ ...

Competitive Landscape

USA and Europe are the leaders in terms of market participation and adoption rate. Germany and Great Britain dominate the European market, while USA dominates the NA market.



Industry Interactions

