



Heat to Electricity. **No Moving Parts.**



Atlas will eliminate open flaring!

Enabling technology which:

- **Reduces greenhouse gas emission**
- **Improves production efficiency**

THE TEAM



Ian Hamilton
CEO & President

B.S. Engineering, Materials Science,
Purdue University
M.S. Nuclear Engineering,
Purdue University
Forbes 30 under 30



Scott Noble
CFO & Treasurer

B.S. Accounting, IWU
MBA, University of Notre Dame
Experience: Large tech Strategy,
tech buy side M&A (Autodesk),
startups, and startup finance

Contractors and future FTEs



Kazuaki Yazawa, Ph.D.

Research Professor & Thermal Engineer,
Purdue University
Thermal power generation
Experience: Thermal component
integration design (SONY)



John Hasse, Ph.D.

Mechanical Engineer
BS Engineering Physics & Mechanical Engineering, Kettering University
MS Mechanical Engineering, University of Notre Dame
Ph.D Mechanical Engineering, University of Notre Dame
Thesis: Thermionic energy converters



Seiji Thielk

Manufacturing Engineer
BS Materials Science,
University of Washington

Board of Directors & Advisors



Scott Baxter

Chair Board of Directors, SEED Investor Seat
Former product development executive
Roche, Aptiv (Delphi), Thomson
(Techicolor), and Allegion



Georges Sassine

Board of Directors, Independent
Former executive at GE Power, Distributed
Power, Energy Systems
Techstars Managing Director



James Barkley, JD

Board Observer & Secretary
Former General Counsel Simon
Property Group (NYSE: SPG)
Multiple boards, M&A, compliance

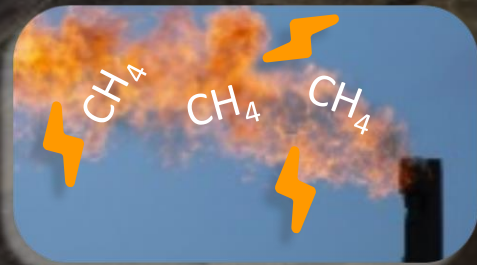


Technical Advisors

Research PhDs & Engineers
(Non-disclosable)

PROBLEMS

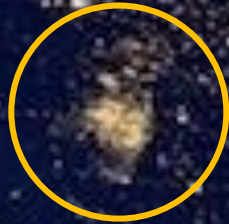
Flares which emit methane
(CH_4 is 25X CO_2)



Equipment and crew facilities need power



IMPACT



Bakken



Permian Basin



Eagle Ford



Gulf offshore

80,000+ flares globally

~82MMT tons methane emissions

~480,000MW power wasted

Solution –Thermionic Energy Converters_(TECs)

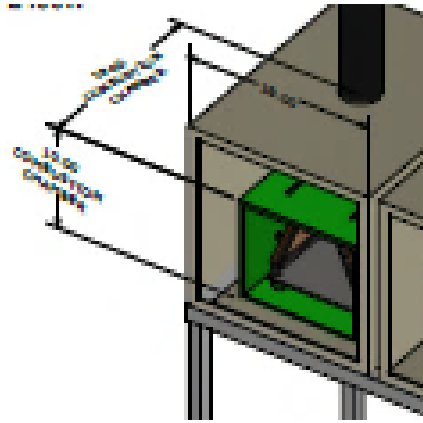
Devices which convert high grade heat into electricity



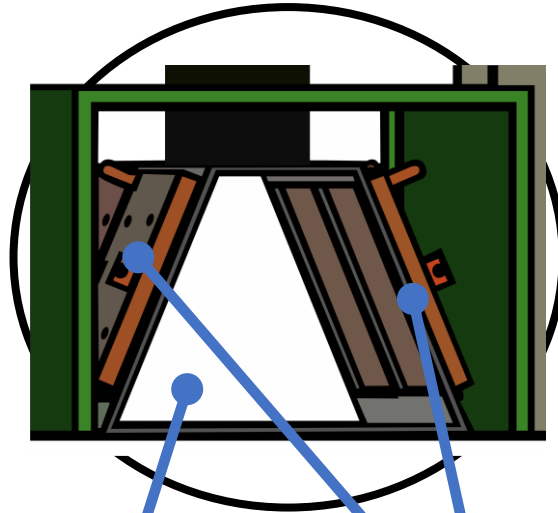
Sample prototype

GTM Applications – Oil & Gas

- Production efficiency
- Regulatory compliance
- Emission intensity reduction



Remote Power Generator
(500W to 1kW)



Combustion Chamber

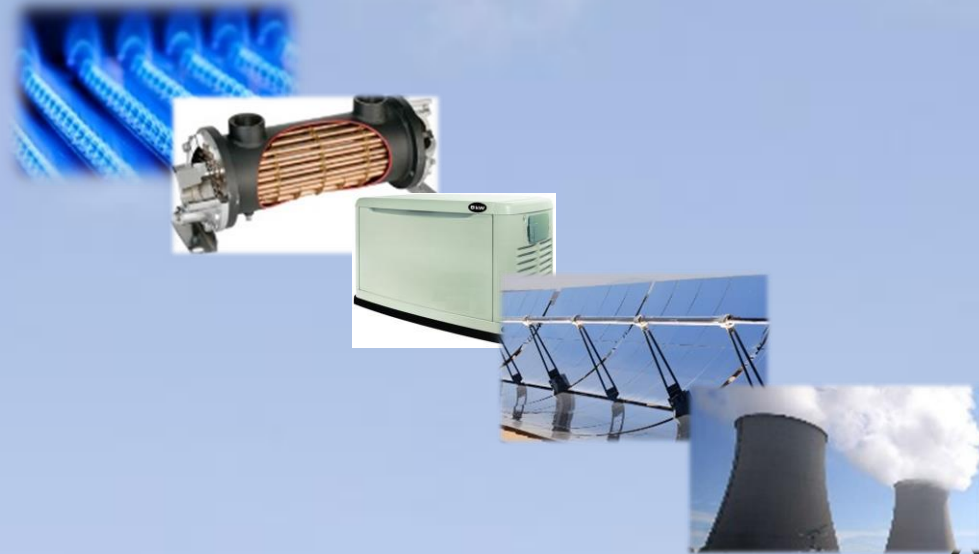
TECs



Gas Flare Capture System
(1MW to 12MW)

Market Size – O&G Go-To-Market

- O&G Remote Power; \$4.8B
- O&G Flare capture systems; \$11B
- Follow-on markets: \$250B+
 - Natural gas topping cycle & co-generation
 - Industrial heat exchange
 - Commercial and residential backup power
 - Concentrated solar
 - Advanced nuclear power

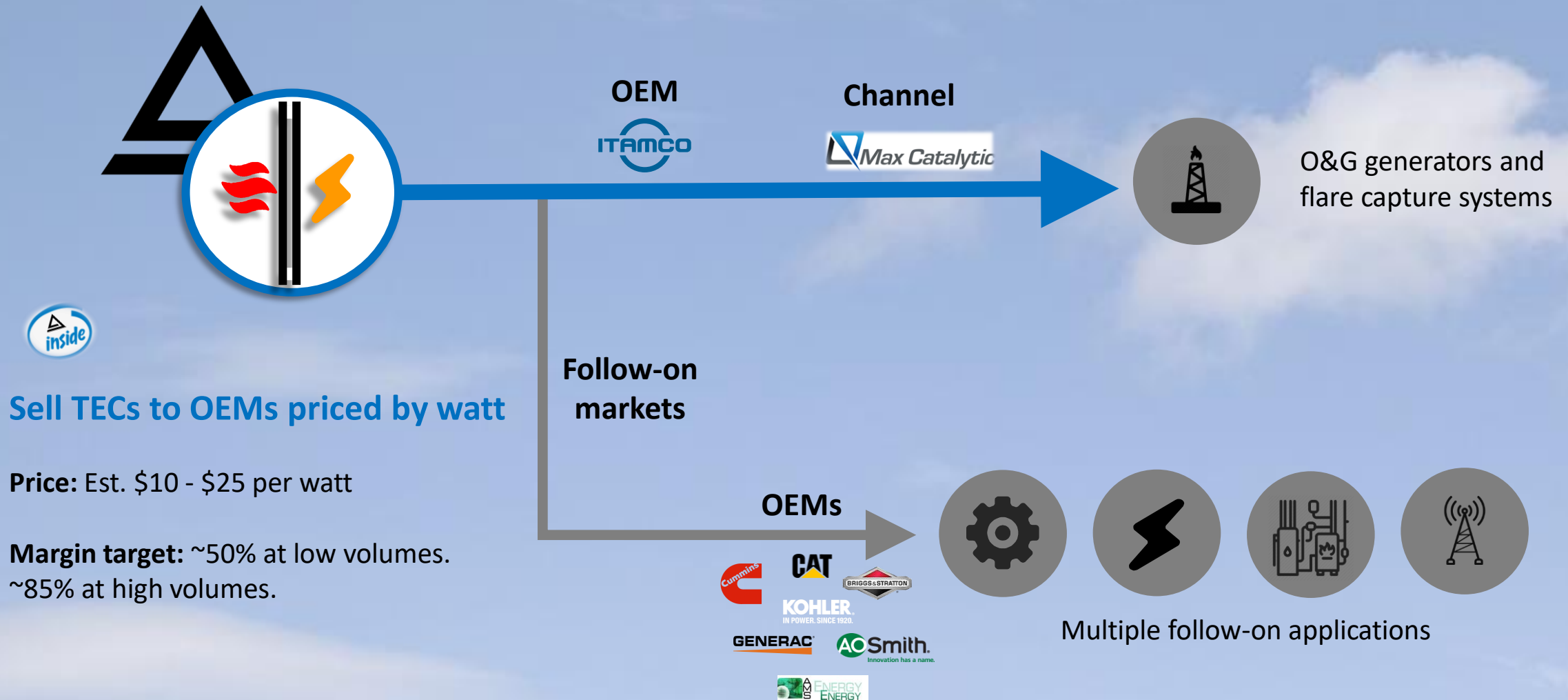


Market size estimates are bottoms up calculated using various sources for units sold and revenues.

Competitors – O&G Generators

O&G (Entry Market) Remote Power Generation Options					
Requirements / Pain points	Atlas Thermionic	Thermoelectric (Gentherm)	Stirling engine (Qnergy)	Nat'l Gas, Diesel, Battery+Solar	Grid Power
Field proven	Sept/Oct 2020	NO – fail with temp cycles and overheating	YES	YES – where applicable	YES – where applicable
Low maintenance	YES	NO – sensitivity to operating conditions requires maintenance	YES & NO (contains moving parts)	NO – complex system and/or refueling	YES – if available
Wide operating condition variables	YES	NO – sensitive fuel input variability; cooldown and overheat cycles	YES	Limited	YES
Remote locatable	YES	YES	YES	Limited	NO – cost of build out
Multiple fuel sources	YES – agnostic to heat source	YES	YES	Single – per system	YES (N/A) – centralized
Power turndown	YES – immune to heat buildup	NO - Requires active power draw flow controller due to internal heat buildup	NO	Requires regulator or battery systems for excess draw	YES
Favorable cost	YES	NO	NO	Varies – dependent on fuel source, existing infrastructure, remote location	NO – infrastructure build-out required
Reliability / Redundancy	YES	NO – not economically viable	YES	Limited – entire redundant systems required	YES
Power density / low footprint	YES	NO	YES	Limited	YES
Improves energy use sustainability	YES	YES	YES	NO	NO

Business Model



IP & Milestones

Granted Patent
Nuclear thermionics
and general
thermionic materials



Patent Pending
Thermionic materials
and electrode
configurations



Provisional Patent Application
Core thermionic converter designs
with novel materials, manufacturing
processes, and operation



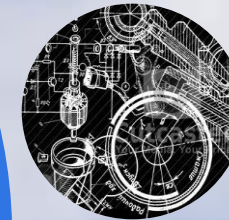
Expect 5 to 7 patent grants



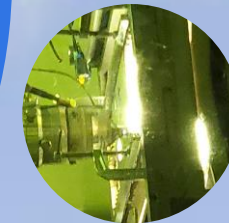
Concept formulation
2017



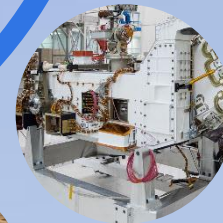
Laboratory validation
2017 - 2019



Design MVP #1
2019



Bench build MVP #1
May/June 2020



Demo generator installation
July/August 2020



Demo generator field test
Sept./Oct. 2020

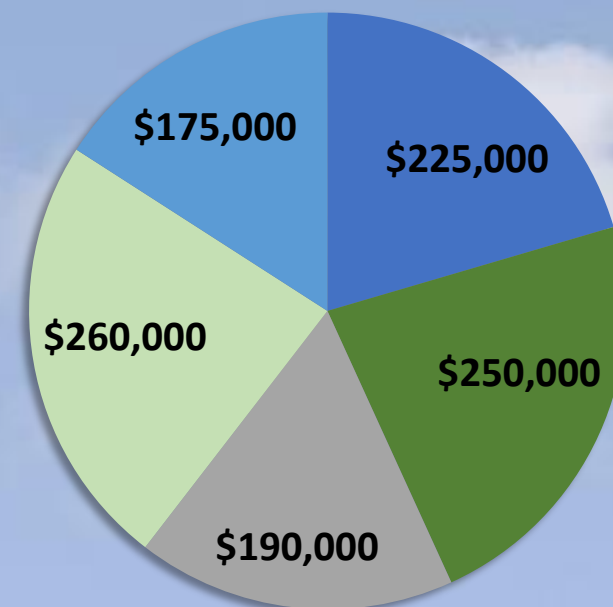
Ask

Raise: \$1.1M @ pre-money \$4M valuation

Preferred stock Series SEED term Summary:

- Tiered annual cumulative dividend
 - \$1 to \$558k – 9% - Closed Dec. 2019
 - \$559k to \$900k – 8%
 - \$901k to \$1.1M – 7%
- 1 Board Director for Series SEED investors
- Executed term sheet available for review
- Lead: **VisionTech** (IN); CO: Lateral Capital (FL), West Suburban Angles (IL)
- SEED2 commitments:
 - **VisionTech \$220k+**
 - Tamiami III (FL) – amount pending

Series SEED Budget



- Mfg. eng, tooling, COGS, 1st MVP short run
- COGS for first commercial volume runs
- Management
- Engineering, Business Development
- R&D, engineering, testing, 2nd device design

Raised prior to SEED: ~\$1M from founder, non-dilutive awards, Argonne contracts

This is not an offer to sell or solicit any security.

Financial Summary



Financial Milestones

- **Breakeven by Q4 2021**
 - Self funded growth by Q2 2022
- **SEED funding enables viability**
 - **Series A** round if Atlas chooses to manufacture flare capture systems without an OEM partner
- **Exit Potential 2023+**
 - O&G Large integrated, Major/Mid Major
 - Or IPO 2025+



Heat to Electricity. No Moving Parts.

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Appendix

History & Milestones

	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1+ 2022
Financial			Begin \$1.1M SEED Capital raise		Closed SEED1 \$558k	DD: Tamiami, Purdue Ross Fund Committed: \$170k VT2				First revenue: small generator			Potential Series A	
Product					Design MVP #1		Bench build MVP #1		Flare capture design		Flare capture demo build		Flare capture field demo	
GTM														
Human Resources														
Administrative														

Lab builds and testing

Design MVP #1

Bench build MVP #1

Deliver TEC to ITAMCO

Field test generator

Flare capture design

Flare capture demo build

Flare capture field demo

Industry #2 MVP design, build & test

O&G Customer research and validation

Business Model Design

Secure generator S&D

Secure flare capture S&D

Added CFO + Strategy

Added contract Thermal Eng., Mfg. Eng., Thermionic PhD

CTO FTE

PhD FTE

Mfg. Eng. FTE

PT: Marketing, Admin

Biz Dev FTE

Exit Argonne CRI

Patent Pending & provisional patent process

Review in-house mfg. and location

Prov. Patent Filed

C-Corp Conv.

Secure outsource volume manufacturer

Secure generator mfg partner or JV

Appendix: Exit Opportunities

Financial: ~\$180M exit around 2024; Integrated Energy or O&G Mjr./Mid Mjr.

IMAP 2018 report estimates valuation at ~12.1x EV/EBITDA

Strategic: ~\$1B+ exit around 2024; Integrated global energy company

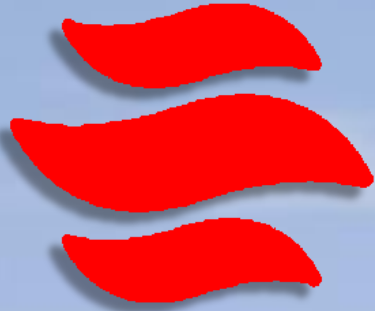
Based on early discussion with potential acquirer and industry experts due to flare gas methane reduction.

~2026 IPO



Appendix:

Solution – Thermionic Energy Converters (TEC)



Sample design

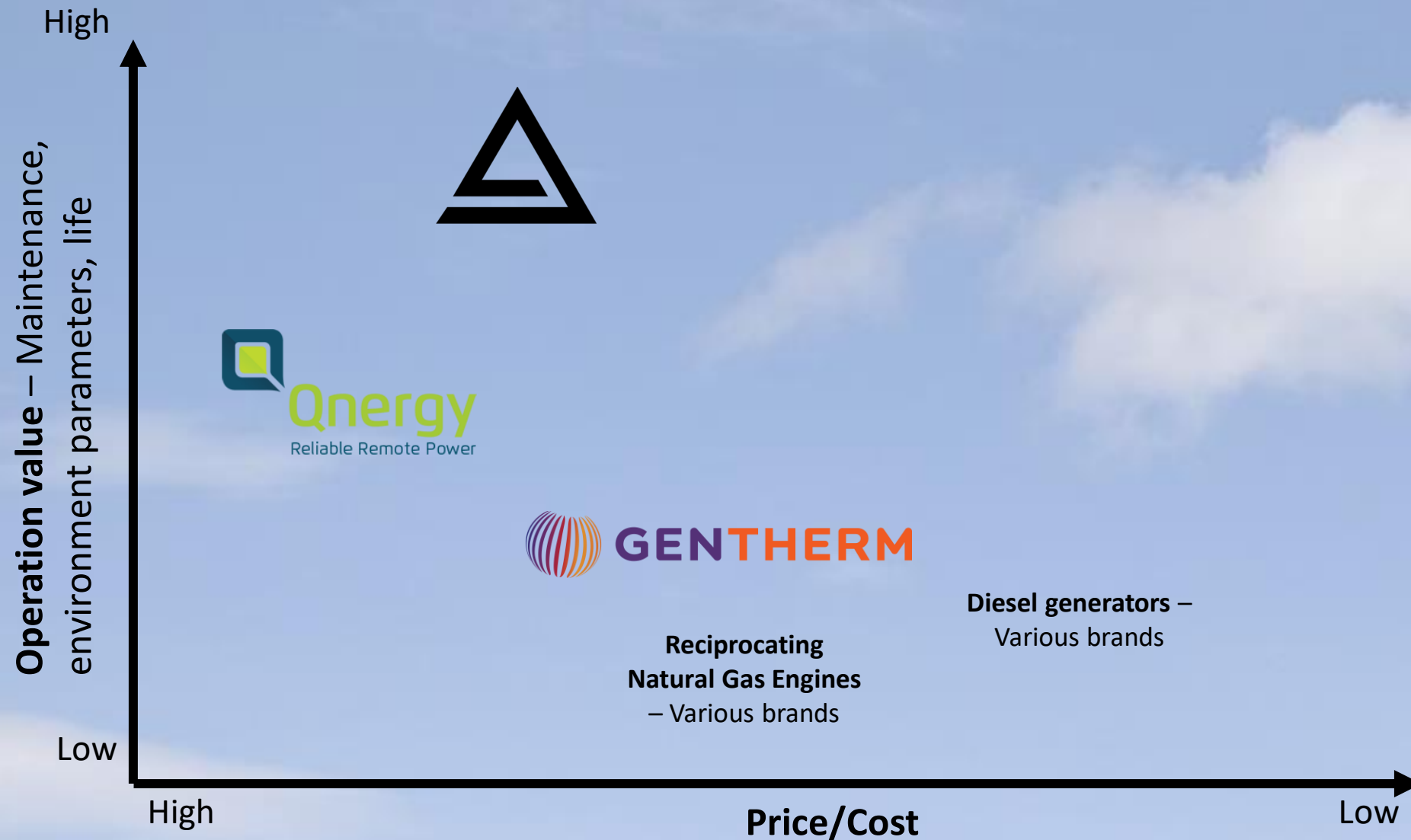


- **Convert heat directly to DC power**
- **No moving parts**
- **Durable – long life**
- **Agnostic to heat source**
- **Flexible form factor**

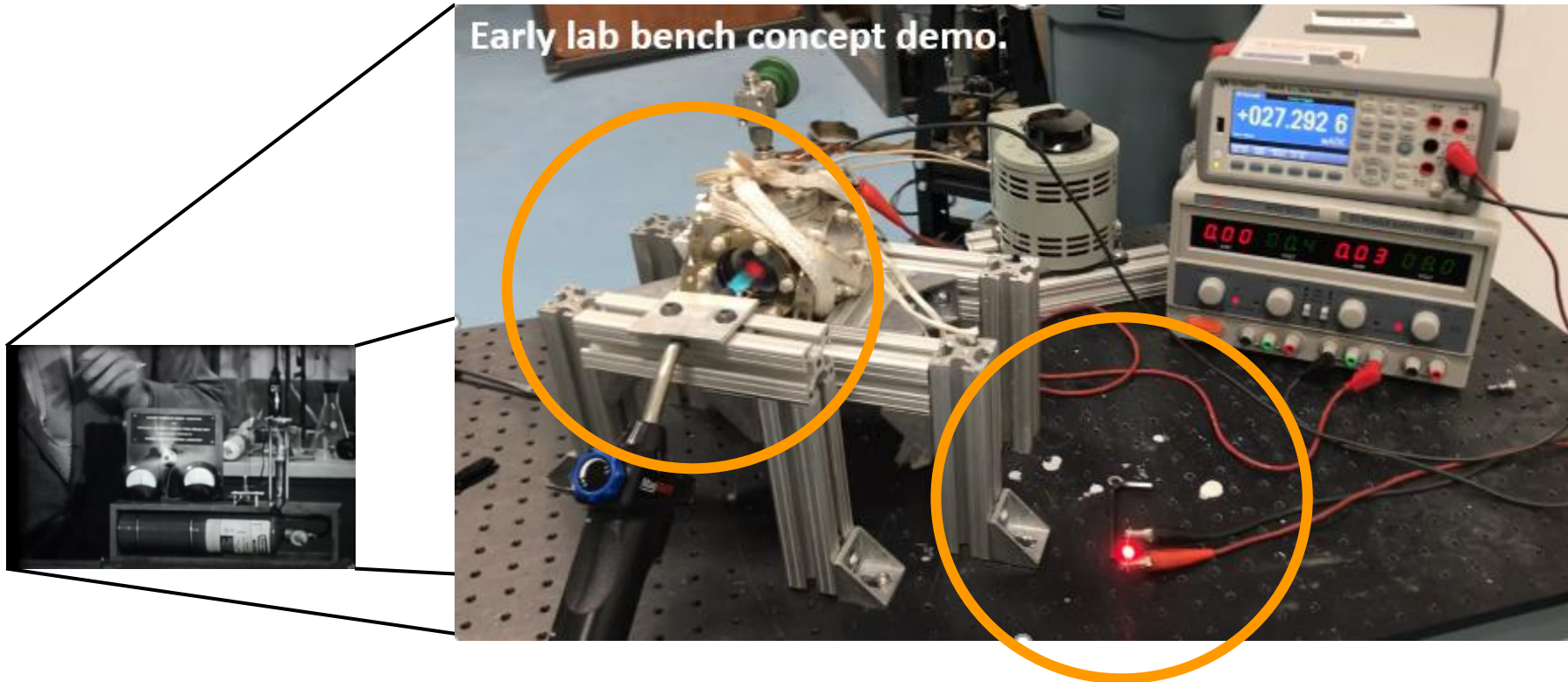
Competitors – Thermionic Converters



Competitors – O&G Generators



Demo –Thermionic Energy Converters



Atlas materials,
design, and
manufacturing IP
enables viability.

First known company to replicate early
attempts at commercialization.