

MEET LAVA

Founded in 2020 to move the needle on climate change

The first isothermal thermodynamic cycle

Proven Technological Breakthrough
Proprietary thermodynamic cycle

30% Efficiency increase

compared to steam & ORC turbine efficiency

30–80% COP Improvement

in heat pumps at a lower cost

 [Learn how it works](#) →

Game-Changing Market Impact

- Small Modular Reactors (SMRs)
- Geothermal power
- Long-duration energy storage
- Heating & cooling markets
- Steam turbine
- Heat recovery

Traction & Funding

\$20M

Raised in 2022/3 (seed + SAFE)

\$40M

Currently raising, led by Watershed Generation, a sister company of Watershed GEO (Berkshire Hathaway subsidiary)

Initial closing of \$22M already done.

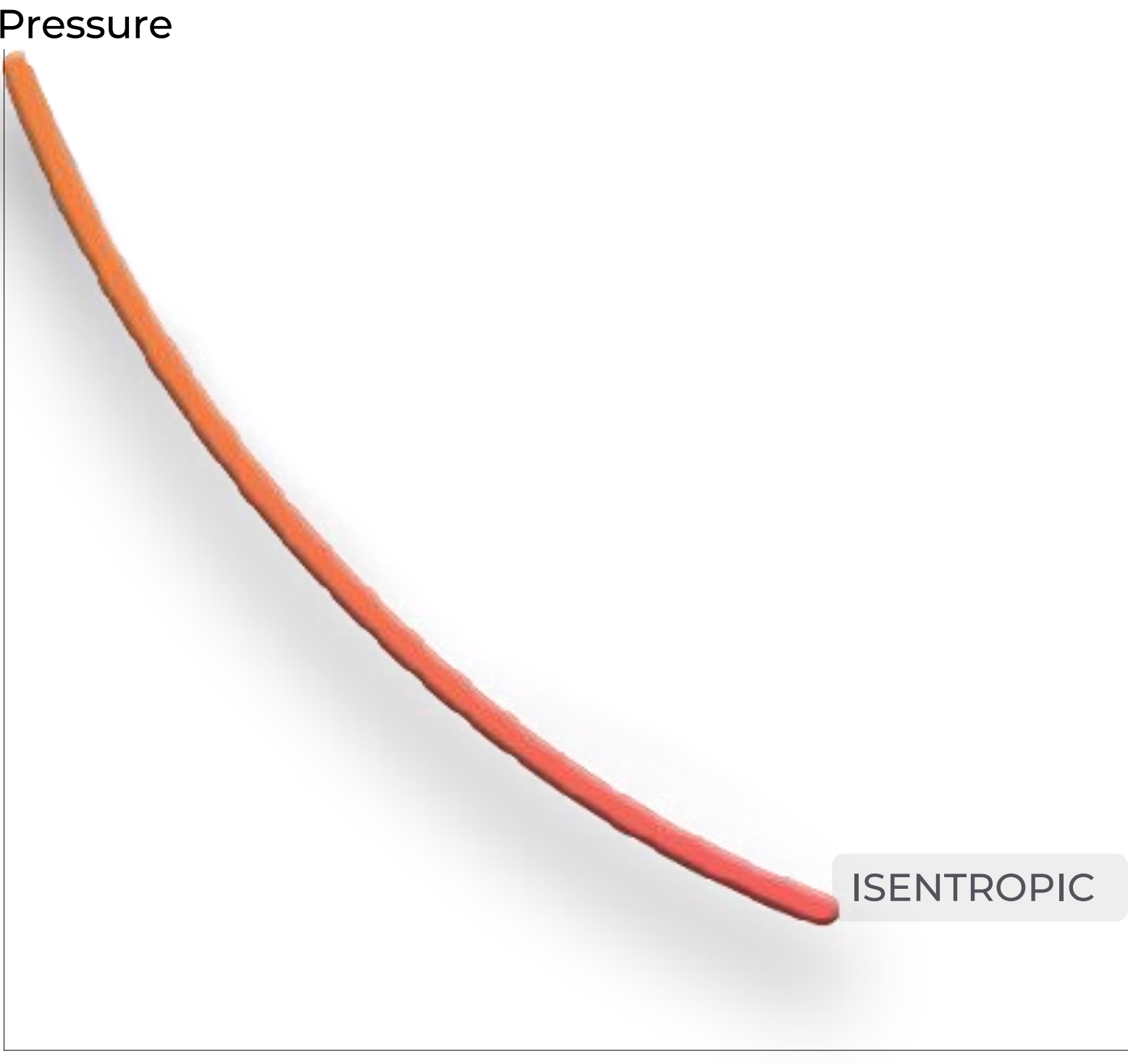
We are looking to raise another \$10

LAVA
FOLLOW THE HEAT

PROBLEM

Current technologies rely on inefficient isentropic principles

120 year-old technology developed for the steam engine train



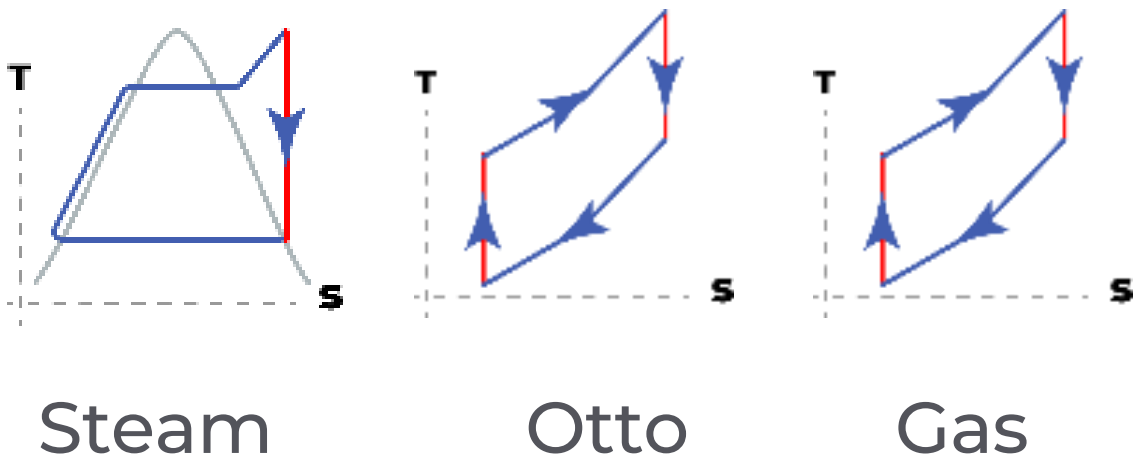
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EXISTING WAY
AS GAS EXPANDS IT COOLS

Current technologies for converting heat into electricity and electricity into heat rely on inefficient isentropic principles

60% CARNOT EFFICIENCY

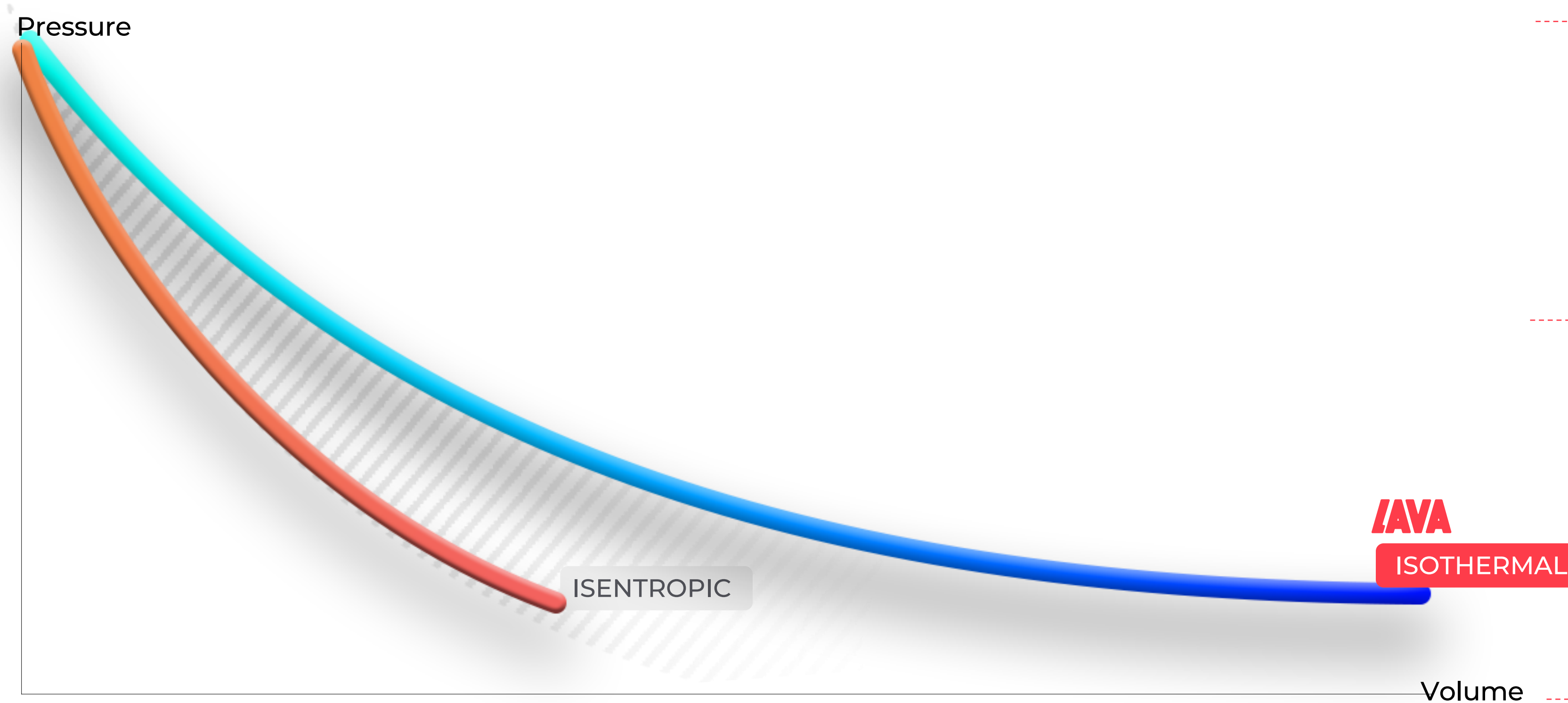
RANKINE, OTTO & BRAYTON



SOLUTION

We've developed a new thermodynamic cycle that is 30%+ more efficient than existing technologies

Lava keeps gas hotter for longer, therefore gas expands for longer

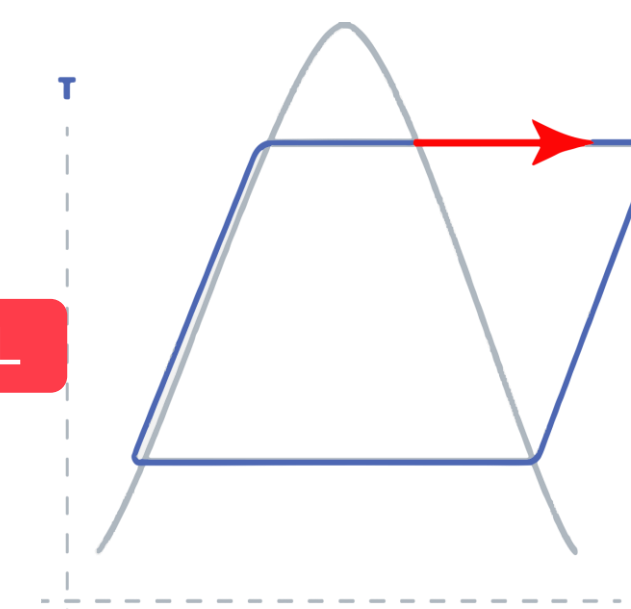


OUR WAY
AS GAS EXPANDS IT STAYS
HOTTER LONGER

We're able to produce more energy
with the same amount of initial
effort

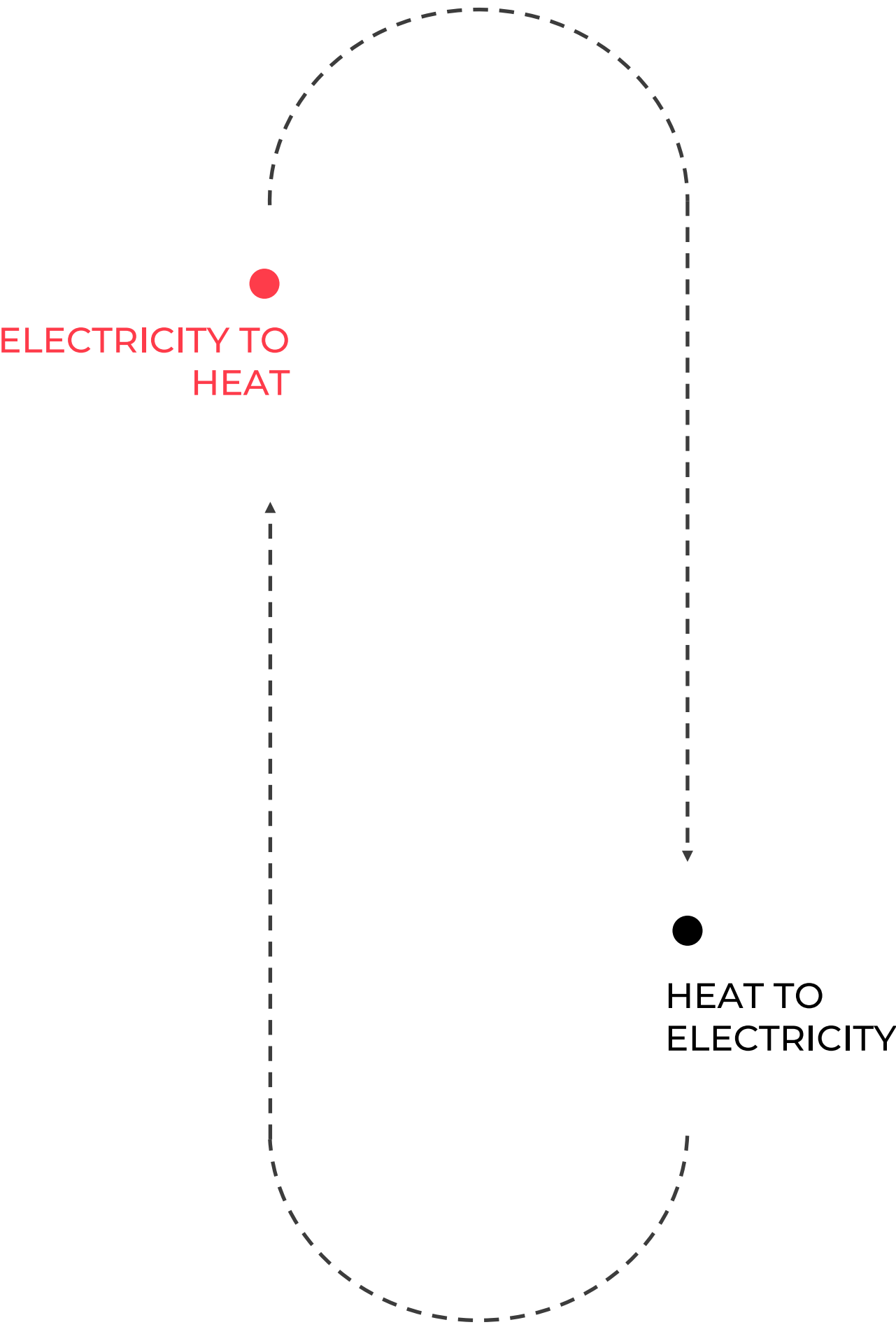
80% CARNOT
EFFICIENCY

LAVA CYCLE



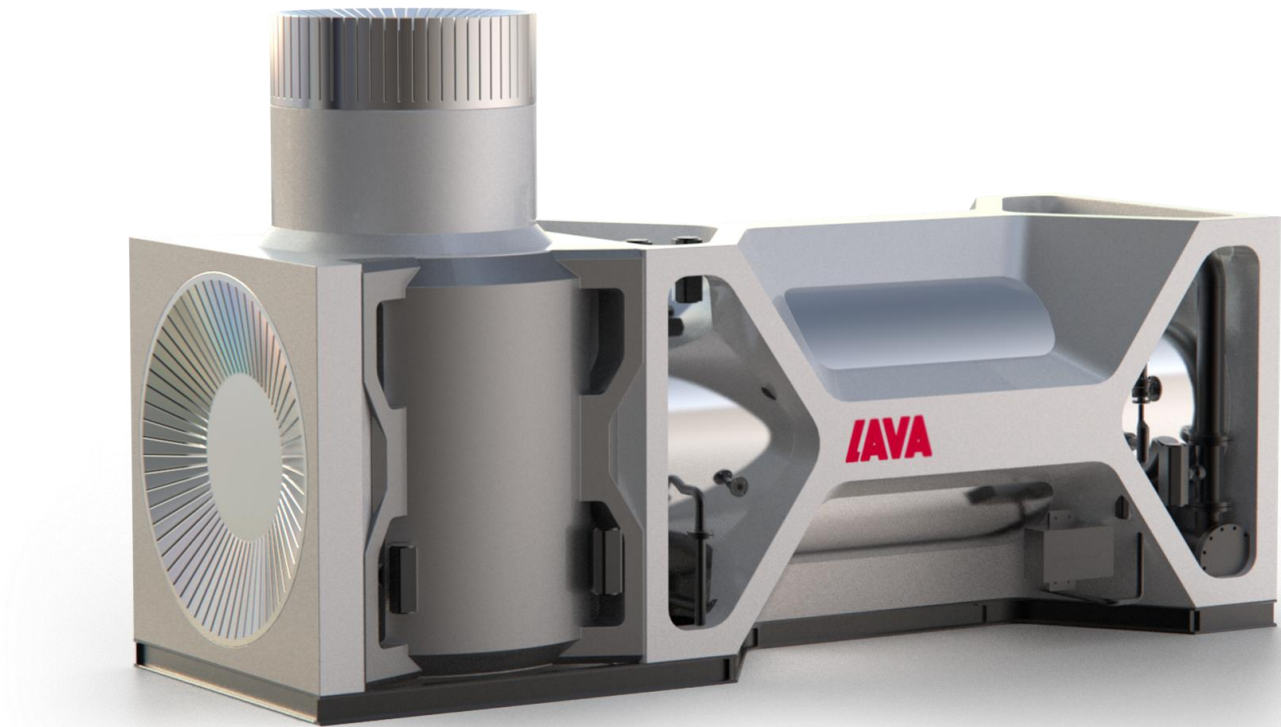
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Two machines, same innovation



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Heat Engine



WASTE HEAT TO ELECTRICITY

Converting gas turbine & gas engine to combined cycle

IMPROVING EFFICIENCY BY

30%

Heat Pump



ELECTRICITY TO HEATING AND COOLING

IMPROVING EFFICIENCY BY

30%-50%

THE POWER OF LAVA

**From the same source of heat Lava can generate
30% more power **At lower cost****

STEAM TURBINE ELECTRICITY GENERATION

45% of the world's electricity comes from steam turbine

LAVA

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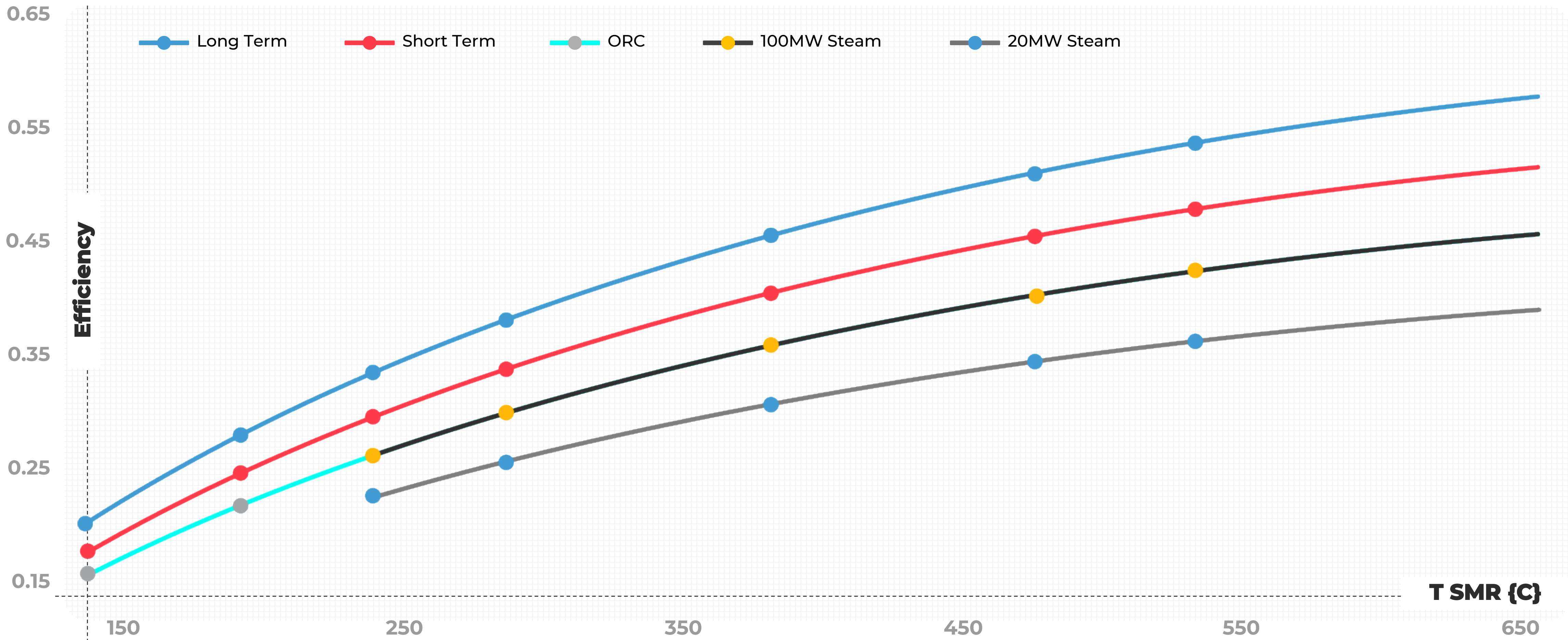
EXISTING WAY
4000GW

LAVA
5200GW

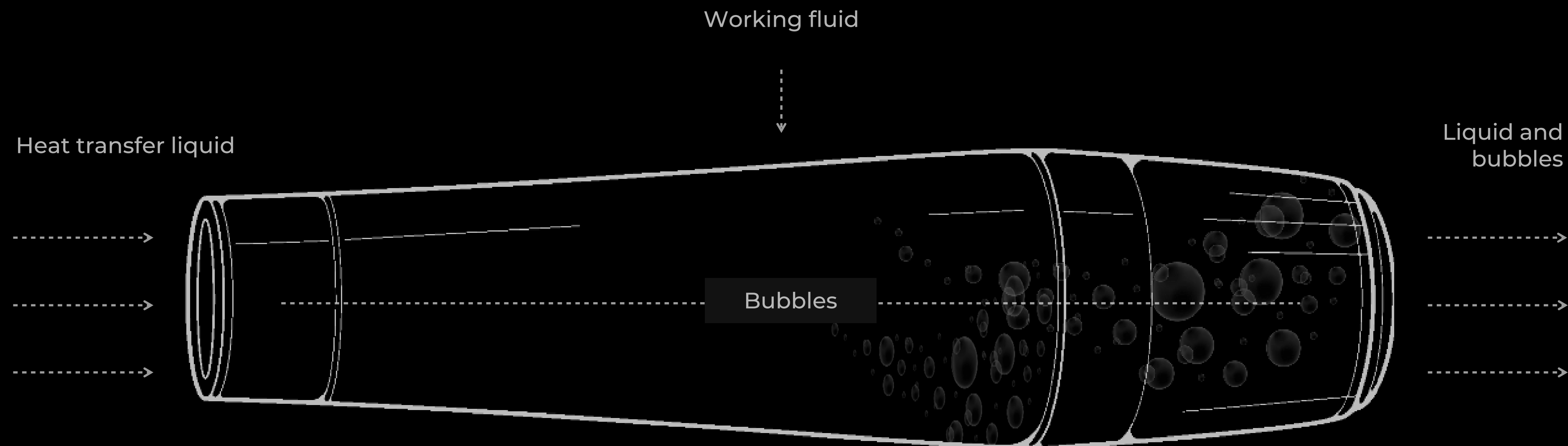
LAVA'S PRODUCTION IS
1200GW MORE EFFICIENT

Equivalent to 2x the total U.S.
electricity consumption

Conversion Efficiency



When the working fluid meets the heat transfer fluid in the nozzle, it forms bubbles as it changes phase



EXPAND ISOTHERMALLY

Carnot efficiency

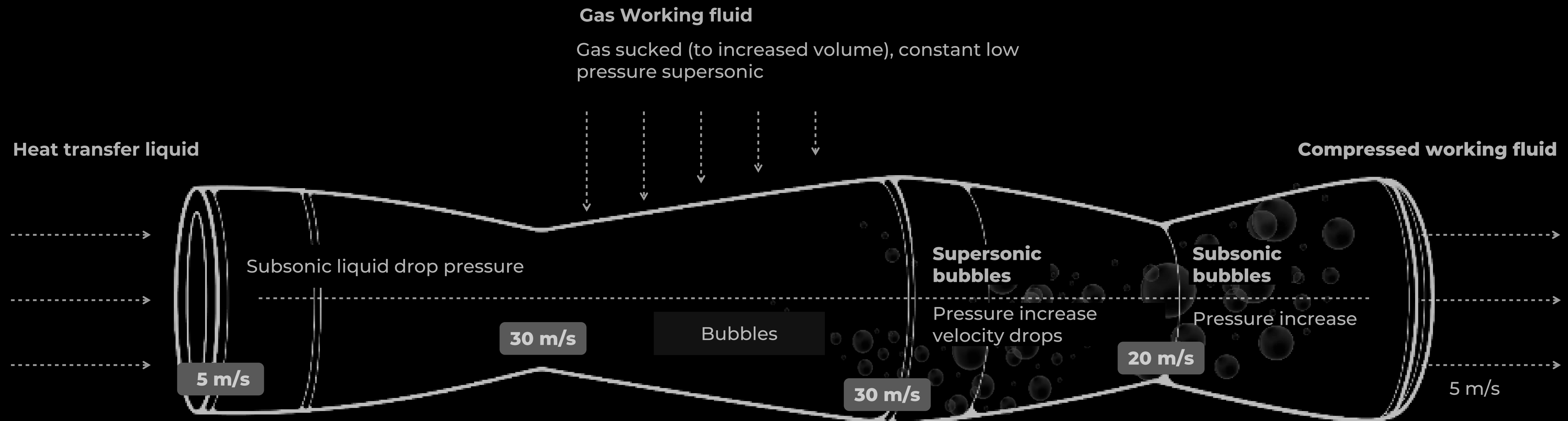
HIGH THERMAL DENSITY

Small size

SIMPLE

Hydroelectric like turbine

Using our thermodynamics cycle in reverse

**EXPAND ISOTHERMALLY**

Carnot efficiency

HIGH THERMAL DENSITY

Small size

SIMPLE

Pump instead of compressor

RESULTS

A Significant Milestone

With our static nozzle has achieved an isothermal efficiency of 91%

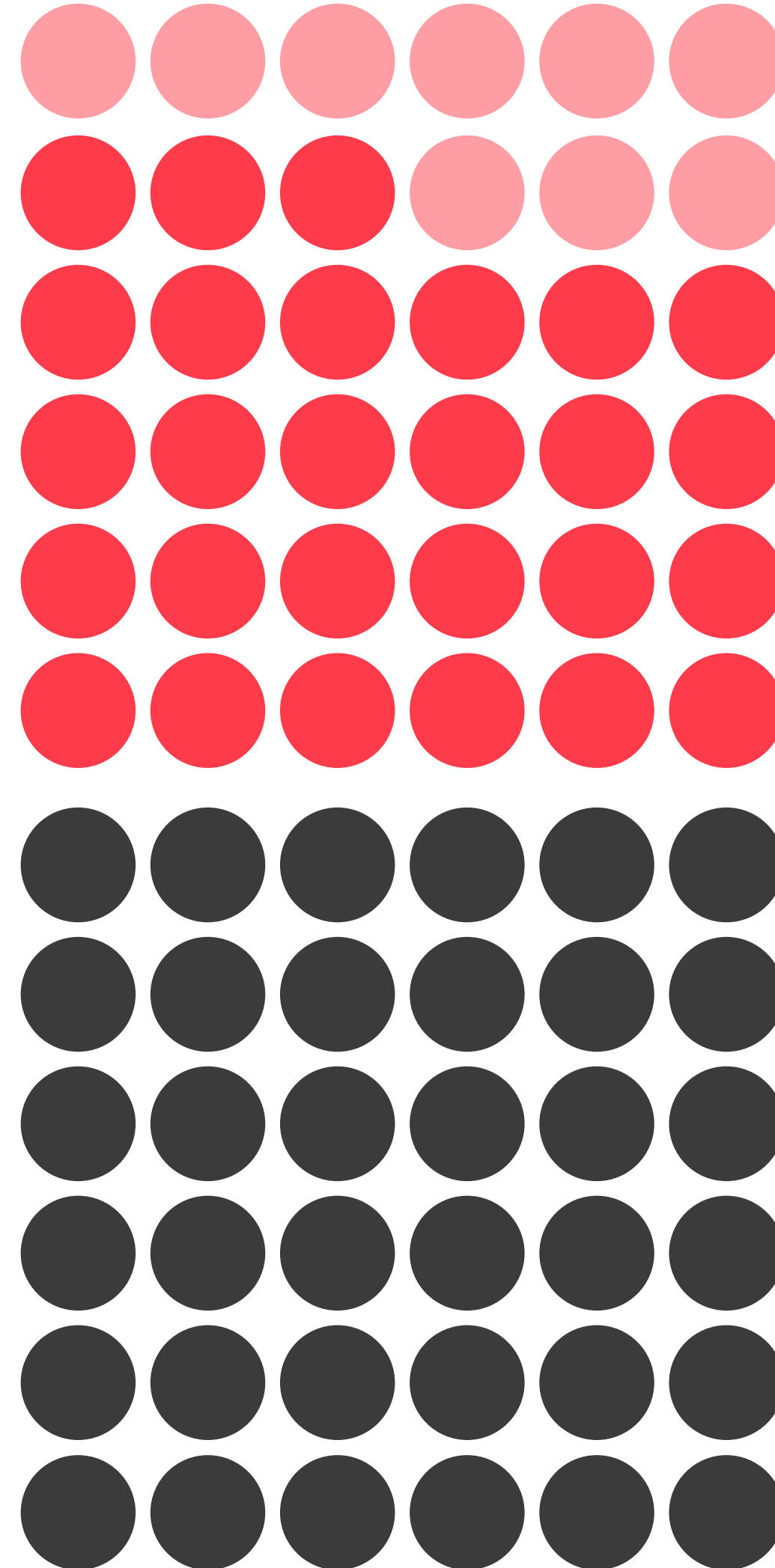
Currently, our operational engine delivers 95% isothermal efficiency at the nozzle.

80% Carnot Efficiency

VS.

Existing solutions at 60%

Carnot efficiency $\approx$ temperature efficiency



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Isothermal Compressor - Prototype

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Lava has applications across industries



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Long-duration storage 250GW \$150B	Compressor CAGR 5% \$175B	District heating & cooling 1,100GW CAGR 4.5% \$220B
Heat pump 200c CAGR 11% \$90B	Air conditioning 700GW CAGR 5.2% \$140B	Geothermal heat engine 30GW CAGR 7% \$30B
Heat pump cooling data centers 150GW CAGR 12.3% \$30B	Industrial waste heat 70GW CAGR 7%-9% \$70B	Replacing steam turbine 6,000GW CAGR 6%-10% \$6T \$6T

\$7T

ANNUAL REVENUE POTENTIAL
BY 2030

COMPETITION

Over 30%
more efficient
compared
to the
competition

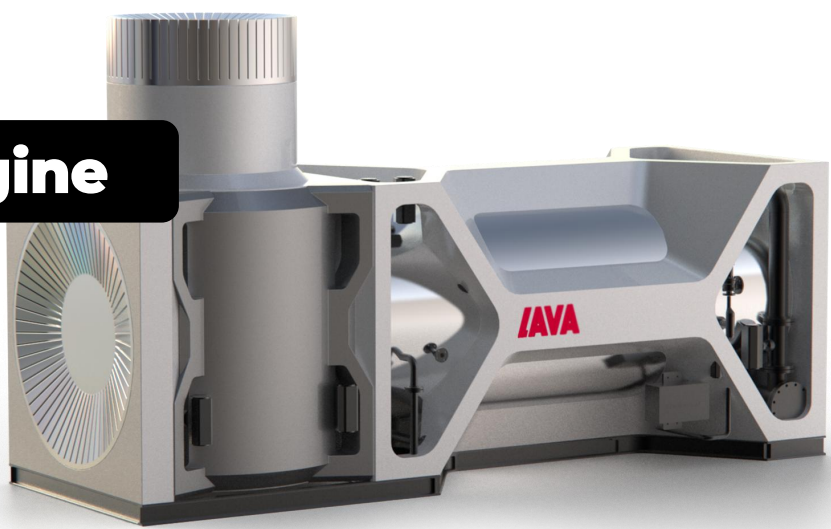
Unique value proposition

Main differentiator

Market Leaders. Up to
10MW units

Competitive advantage

Heat Engine



First isothermal heat engine and the most
efficient one

Isothermal, Single stage turbine. Only turbine
with Turnkey ROI of <3 years

ORCAN, Turboden, Climeon, Exergy, Enertime,
ElectrathermCAPEX Ranging 2500 USD/kW Turnkey
installed product

Net Efficiency 10-20% depending on Waste heat
temperature

-50% of CAPEX
+30% on Efficiency

Heat Pump



The only Isothermal compressor developed as the first
Isothermal vapor compression heat pump for Industrial
heating and cooling application

High COP, No moving parts - low maintenance compressor,
Enables 0 water cooling for datacenters and opens waste
heat recovery segments for residential heating and cooling
with ROI of 4 years

Trane,Carrier,York,Daikin,Mitsubishi
Cooling COP 12/7C ASHRAE 3.0-3.5

Heating COP to 80C
4.0-5.5 depending on waste heat temperature

30-50% Higher COP
Low maintenance compressor



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Data center cooling

MARKET SIZING

With AI upscaling computing power, data center energy consumption forecast demand is expected to increase worldwide from 80 GW to 215 GW in 2030

Computing power is correlated with IT Equipment cooling demand

LEADING IT COOLING TECHNOLOGY PRESENTS
COP 4.26 USING LATEST MAGNETIC CENTRIFUGAL
CHILLER TECHNOLOGY



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A photograph of a data center aisle with rows of server racks. The LAVA logo is in the top left corner of the image. Overlaid on the right side of the image are five performance metrics in white text.

- LAVA**
- 5.77 COP**
Lava heat pump produces a coefficient of performance 35% higher than market-leading products
- \$460K/YEAR**
Savings in a 10 MW regional data center when replacing a schneider cooling system with lava's solution
- \$46M/YEAR**
Potential savings in a 1 GW hyperscale data center with lava's cooling technology
- 4.3 YEARS**
System ROI, delivering cost-effective efficiency

Data center self-generation

MARKET SIZING

The rapid growth of co-location and hyperscale data centers and the abundance of grid capacity to power them is driving the development of distributed energy solutions for self-generation data centers using reciprocating gas engines and small gas turbines

LEADING ORC PRODUCT CYCLES PERFORM AT A MAXIMUM OF 20% THERMAL EFFICIENCY, PRICED AT \$2,000/KW TURNKEY SOLUTION

LAVA'S SOLUTION WITH CATERPILLAR-SOLAR TURBINES GENERATING NEW-BUILD DATA CENTER

Solar Turbine*	Turbine Power	LAVA Combined Cycle	Zero-Emission Power added
Saturn 20	1,210 kW	1,974 kW	63%
Titan 130	16,530 kW	22,300 kW	35%

* Subsidiary of Caterpillar



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improves the ‘Gas to Power’ market benchmark by 30%

OPEN CYCLE TO COMBINED CYCLE
Every year, 3–5 GW of small open-cycle gas turbines are expected to be deployed for data centers. By converting them to combined-cycle systems, we can boost their energy output by up to 40%.

\$1,000/KW CAPEX

1-3 YEARS
System ROI

We are the first to patent this new fundamental physics in heat engines and heat pumps

Allowing maximum efficiency and power

4 IP Families

Isothermal heat engine based on bubbly flow at record efficiency and high-output power

3 IP Families

Combined isothermal efficient power and cooling for data centers

3 IP Families

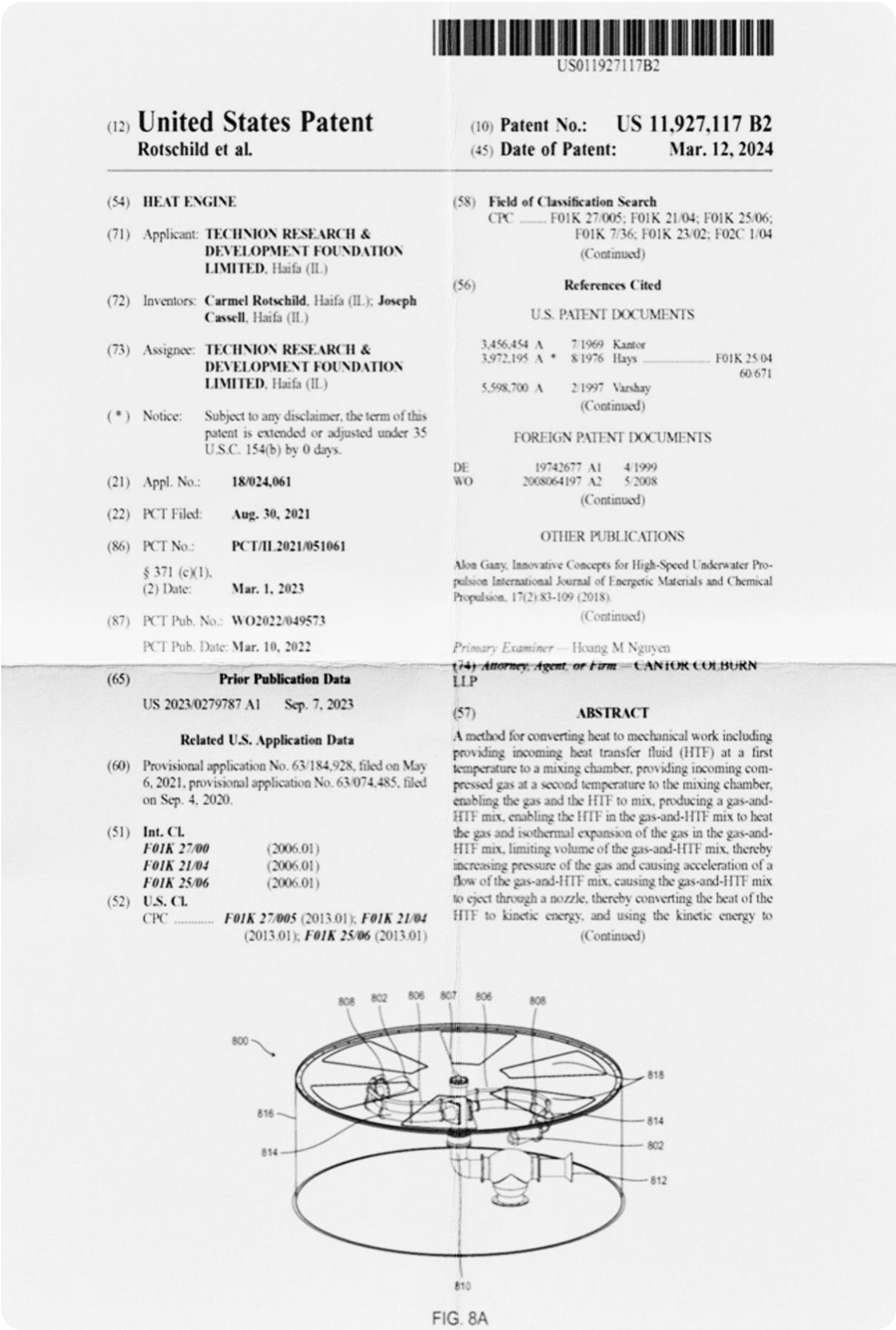
Isothermal heat pump based on bubbly at record efficiency and high-output power

1 IP Families

Efficient Carnot Battery for long-duration storage plus peaker



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Fast return

DIRECT SALES

DIRECT REVENUE FROM ENGINE & SERVICE CONTRACTS
1-3 YEARS PAYBACK PERIOD

Aftermarket services

Maintenance contracts, spare parts, and upgrades

Scalability

Suitable for Data centers, industrial facilities, geothermal, utilities, microgrids, and off-grid applications



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Strong traction from the market



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TARGET CUSTOMERS

ENTERPRISE AND INDUSTRIAL DIRECT SALES **PRE-ORDER OF \$40M**

Directly targeting high-energy industries such as Datacenters, steel, cement, and manufacturing

COLLABORATION WITH EPC & INFRASTRUCTURE FIRMS

Working with engineering, procurement, and construction (EPC) companies for seamless project execution

2025	2026Initial revenues	2027Growth revenues
Heat Engine COMMERCIAL PILOTS	Heat Engine 3-4 COMMERCIAL PROJECTS	Heat Engine 20 COMMERCIAL PROJECTS
Heat Pump PROTOTYPE COOLING OF DATACENTERS	Heat Pump 1 COMMERCIAL PROJECTS	Heat Pump 10 COMMERCIAL PROJECTS

GTM

Active
pipeline

 thyssenkrupp

 ArcelorMittal

 swb

 Schneider
Electric

 NUCOR

 Kanin Energy

 Solar Turbines
A Caterpillar Company

 WG Watershed Geo
Unearthing Solutions

 Rebi
RECURSOS DE LA BIOMASA



STATUS	SOLUTION
Contract process	Industrial Waste Heat
Initial process	Industrial Waste Heat
Contract process	District heating
MOU process	Cooling of datacenters
MOU process	Industrial Waste Heat
Developer agreement	Industrial Waste Heat
Initial process	Power block & Industrial waste Heat
Design partner for Carnot battery	Long duration storage
Contract process	Industrial Waste Heat

Heat engine



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	1ST COMMERCIAL PILOT	2ND COMMERCIAL PILOT	INITIAL PRODUCTION. 2026	SERIAL PRODUCTION. 2027
Project costs	Management & Administration Legal Traveling Construction Development, Licenses and fees Owner supervision	Management & Administration Legal (↓ 50%) Traveling (↓ 100%) Construction Development, Licenses and fees Owner supervision	Management & Administration Legal (↓ 10%) Traveling Construction Development, Licenses and fees (↓ 100%) Commissioning & Testing (↓ 50%)	Management & Administration Legal (↓ 10%) Traveling Construction (↓ 75% economy of scale from 500 to 1000) Development, Licenses and fees (↓ 100%) Commissioning & Testing (↓ 50%)
Product costs	Engineering Equipment Manufacturing Auxiliary equipment procurement Assembly Test and Certification	Engineering (↓ 50%) Equipment Manufacturing (↓ 10% resourcing) Auxiliary equipment procurement (↓ 10% resourcing) Assembly Test and Certification	Engineering (↓ 90%) Equipment Manufacturing (↓ 50% Serial production) Auxiliary equipment procurement (↓ 50% Serial production) Assembly Test and Certification	Engineering (↓ 100%) Equipment Manufacturing (↓ 33% Serial production) Auxiliary equipment procurement (↓ 33% Serial production) Assembly (↓ 90% Automated) Test and Certification
Services costs	Commissioning & Testing Technical Advisory (TA) + Training 1 year warranty Special parts and tools	Commissioning & Testing (↓ 50%) Technical Advisory (TA) + Training 1 year warranty Special parts and tools	Technical Advisory (TA) + Training 1 year warranty Special parts and tools	Technical Advisory (TA) + Training 1 year warranty Special parts and tools
Total Cost per unit	\$ 3,000 / kW	\$ 2,500 / kW (↓ 16%)	\$ 1,500 / kW (↓ 40%)	\$ 1000 / kW (↓ 33%)
Average annual revenue per unit	\$595 / kW 8,500 hours 7 cents	\$595 / kW 8,500 hours 7 cents	\$595 / kW 8,500 hours 7 cents	\$595 / kW 8,500 hours 7 cents
Payback Period	5 Years	4.1 Years (↓ 18%)	2.5 Years (↓ 40%)	1.6 Years (↓ 36%)

EIC accelerator

The EIC Accelerator is the most prestigious funding program under the European Innovation Council (EIC), designed to support startups and SMEs with breakthrough innovations. It provides grant funding of up to €2.5 million and equity investments of up to €15 million. The program focuses on high-risk, high-impact technologies with the potential to scale globally.

WE WON €12.5M

“

THIS INNOVATION WILL HAVE SIGNIFICANT SOCIETAL, ECONOMIC, ENVIRONMENTAL, AND CLIMATE IMPACT

...by enabling more efficient and affordable utilization of waste and low-temperature heat.

“

THE COMPANY HAS A VERY CLEAR MISSION AND VISION TARGETING THE ENERGY MARKET

...for waste heat valorization at low to middle temperatures with a novel idea significantly improving conversion efficiency to mechanical/electrical energy at much higher power densities.

“

LUMINESCENT'S LAVA HEAT ENGINE HAS THE POTENTIAL TO SCALE UP SIGNIFICANTLY

...given its broad applicability across industries such as geothermal energy, steel manufacturing, and data centers, all of which are under increasing pressure to enhance energy efficiency and reduce waste

“

GAME-CHANGING EFFICIENCY OF HEAT-TO-ENERGY CONVERSION

The proposed innovation has a high degree of novelty given the game-changing efficiency of heat-to-energy conversion, making the process financially much more viable and increasing the likelihood of large-scale implementation.

“

THE TIMING FOR THIS INNOVATION IS EXCELLENT

...as industries and society are actively seeking improved performance at lower costs for converting highly available but underutilized energy sources into clean electricity

LAVA

FOLLOW THE HEAT

Unique combination of excellence

LAVA

FOLLOW THE HEAT

45 employees



CEO & CO-FOUNDER

DORON TAMIR

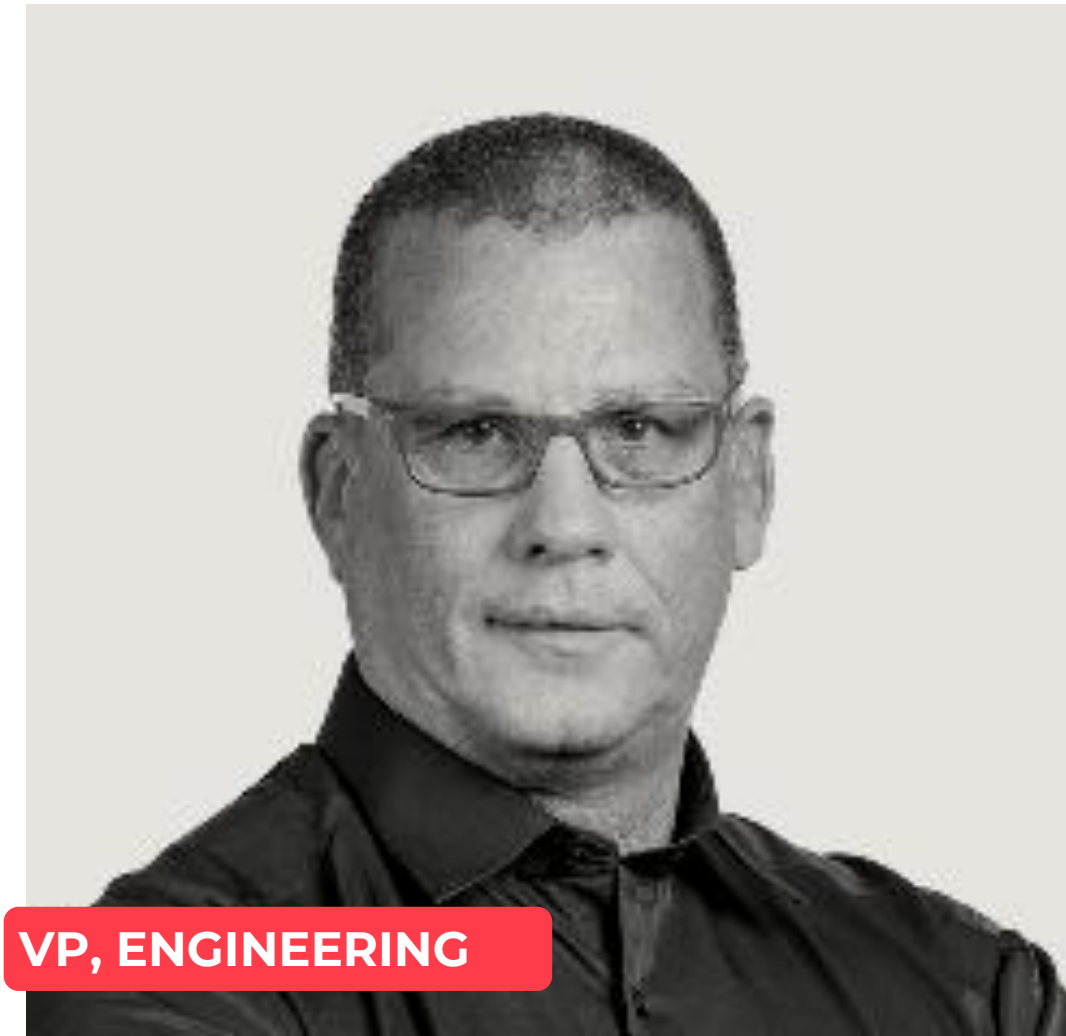
Energy innovator specializing in advanced thermodynamics and heat-to-power conversion. Founder of LAVA, developing a high-efficiency heat engine and pump. Led a \$500M solar project with EDF EN & TOTAL EREN



CTO & CO-FOUNDER

PROF. CARMEL ROTSCCHILD

Second-time founder (RealView Imaging), PhD in Physics, and Technion professor. Holds 60+ patents in advanced technologies, now focused on LAVA's breakthroughs in heat-to-power and thermal energy



VP, ENGINEERING

EREZ KLEIN

Former Executive VP Operation at Ormat systems, 24 years at Ormat. 350 employees, 60 engineers, \$350M revenues



CFO

LITAL NARKIS

Certified public accountant. Expert in finance and business disciplines, executing strategies that drive growth and innovation

MAJ
INVESTGRÖVE
VENTURES

TECHINT

COMPLIANCE



FOLLOW THE HEAT

COMPANY

IN FINAL APPROVAL STAGE



PRODUCT

IN PROCESS



IMPACT

COMPLETED



Google Startups for Sustainable Development

Doron Tamir
Co-Founder & CEO
Doron@lavapower.com



Thank you

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