Engineering the Next Era of Energy and Extraction

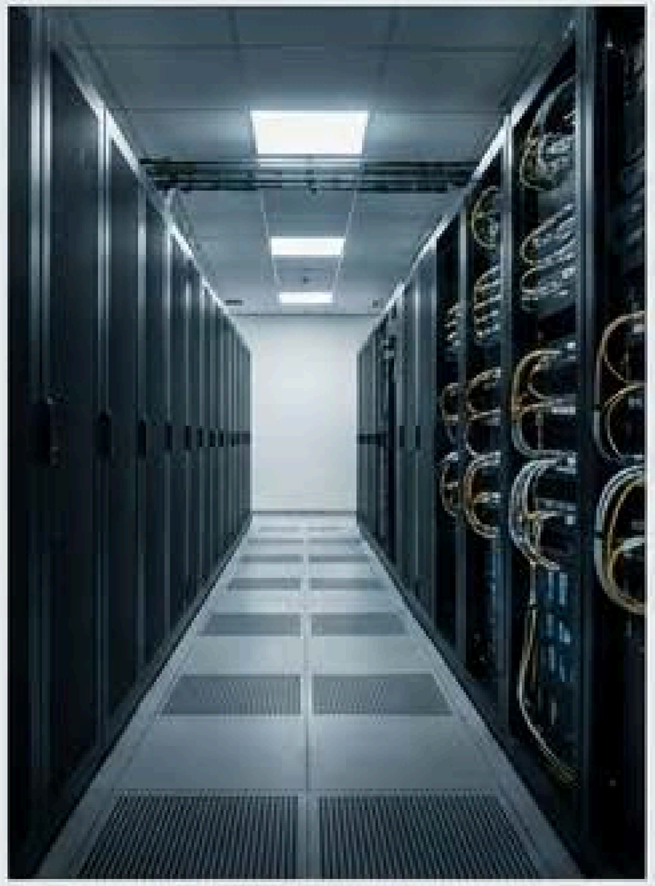
Transitioning from the friction of legacy mechanics to continuous-flow, high-yield architectures.

Modern industry demands a trifecta of resources that legacy architecture cannot supply.

The Trifecta Demand

Baseload Reliability

Industries require 24/7 power; traditional renewables fail the intermittency test.



Zero-Emission Heat

Intense thermal output currently relies on burning diesel, coal, and natural gas.

Resource Conservation

Severe spatial and water constraints are halting development in arid regions.

The Extraction Bottleneck

Stop/Start Mechanics

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Abrasive Wear

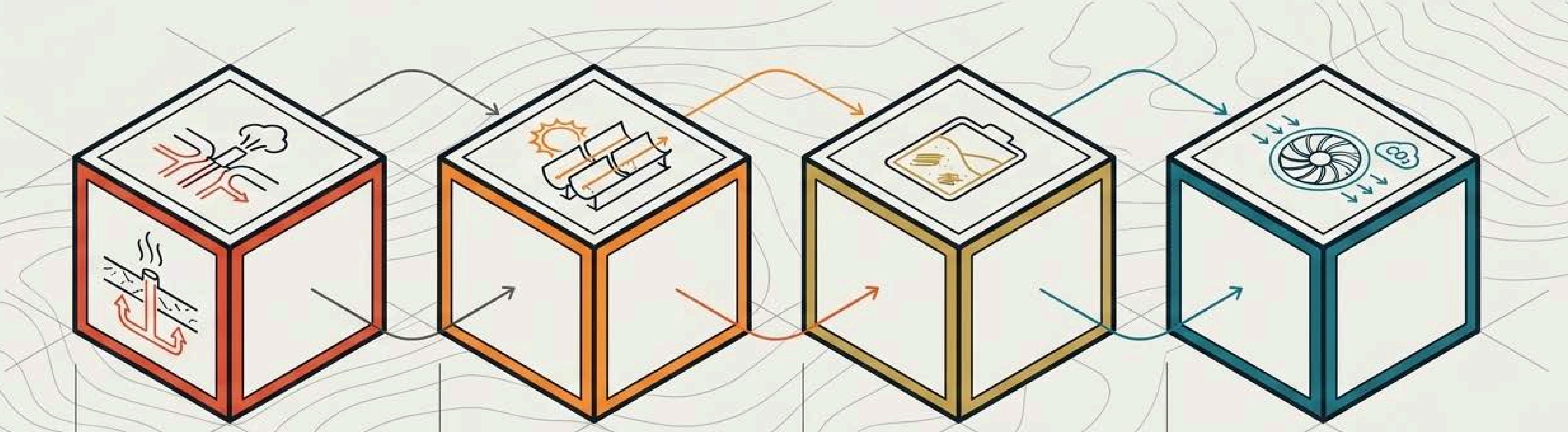
↓

Mechanical Failure

↓

$ Expensive Service Rig Intervention

The SC CoGen Ecosystem: Four technologies engineered to operate as a single thermodynamic engine.



Geothermal Energy

Baseload, subsurface heat extraction for high-demand continuous power.

Compound Concentrated Solar

Advanced optics generating high-temperature thermal energy above ground.

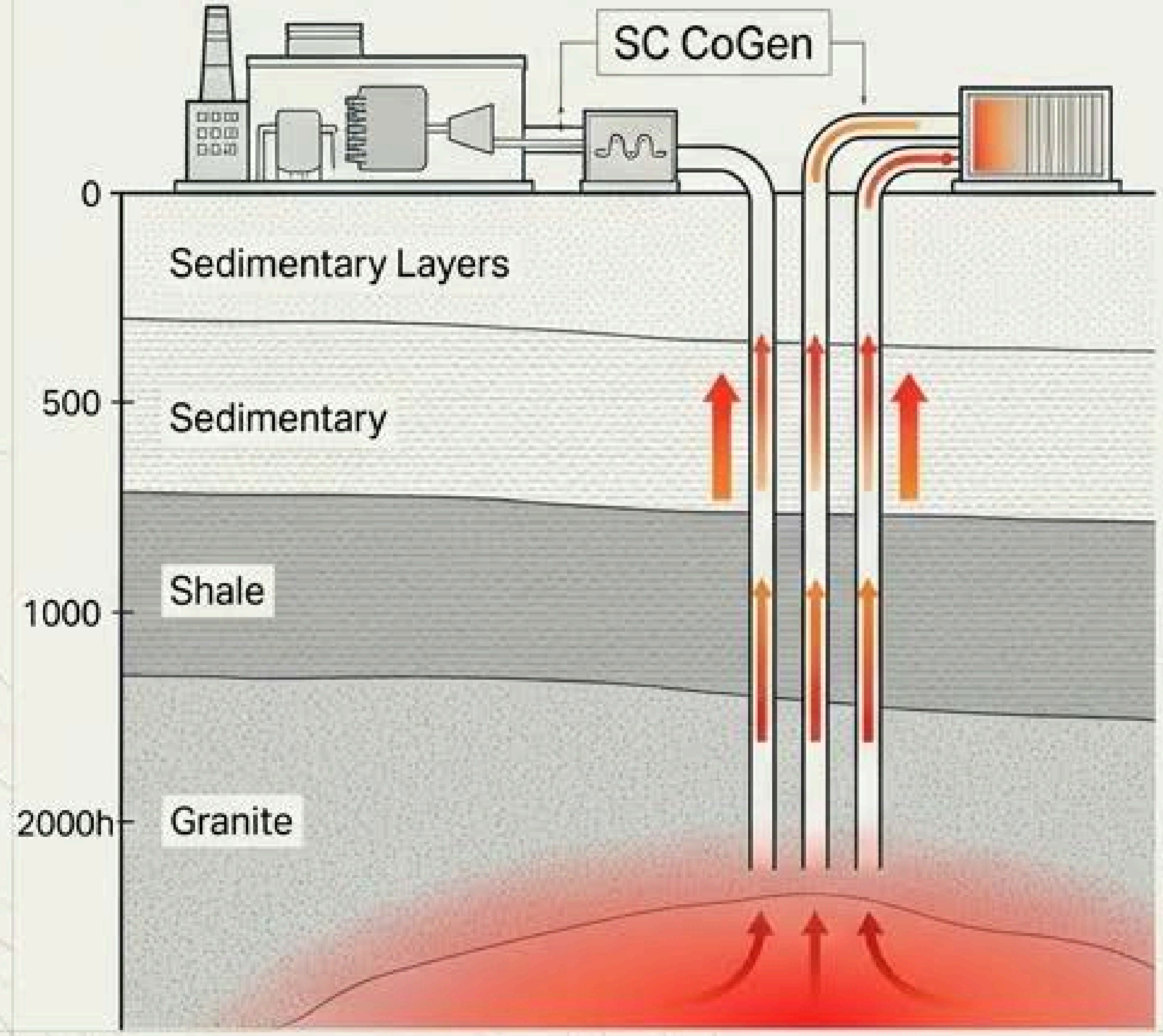
Silicon Thermal Batteries

Pure silica sand acting as a massive thermal capacitor for dispatchable storage.

Advanced Turbine Cooling

Aerospace-derived supercritical CO2 turbomachinery for maximum conversion efficiency.

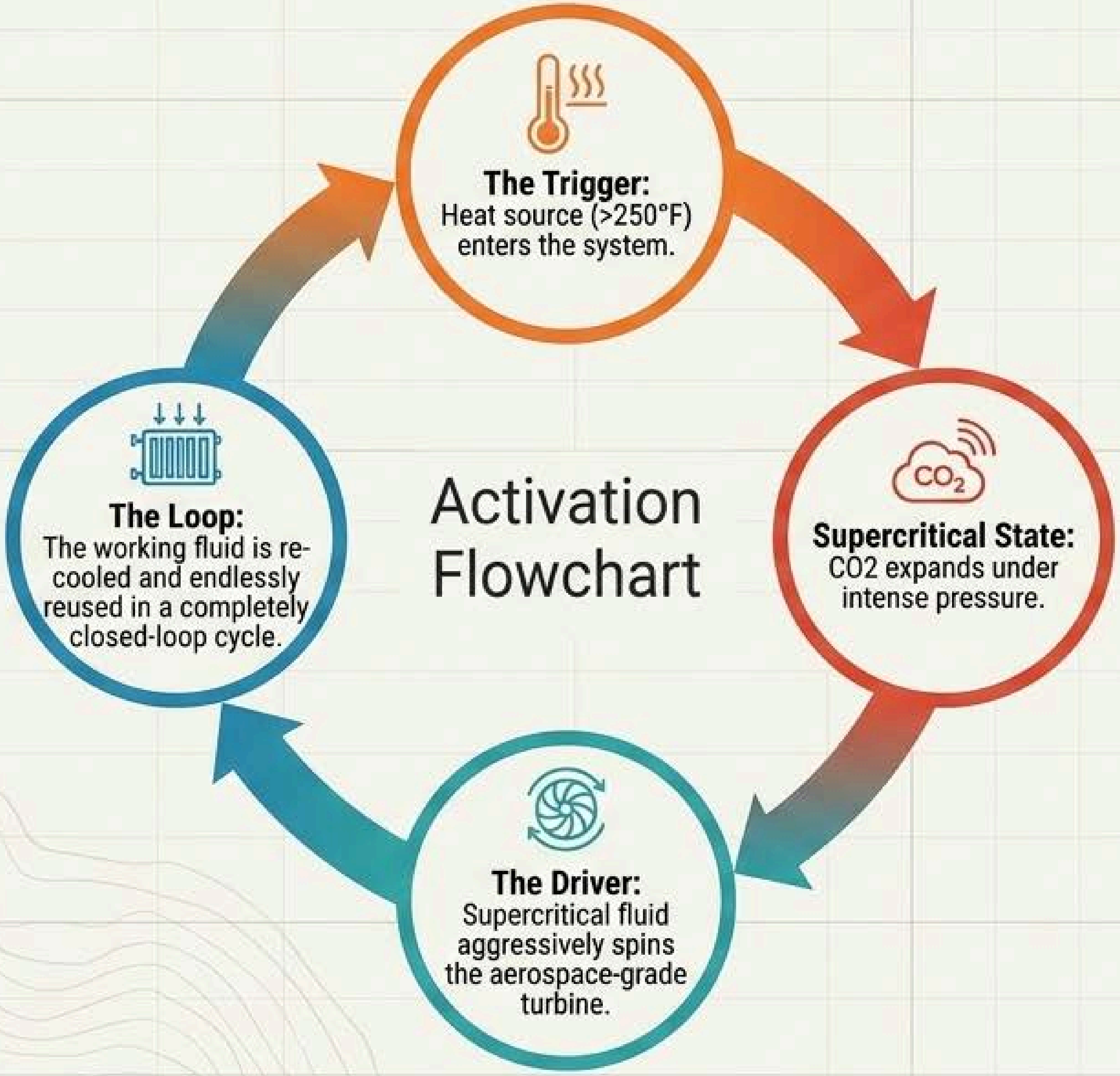
Strategic deployment: Balancing rapid modular storage with massive baseload generation

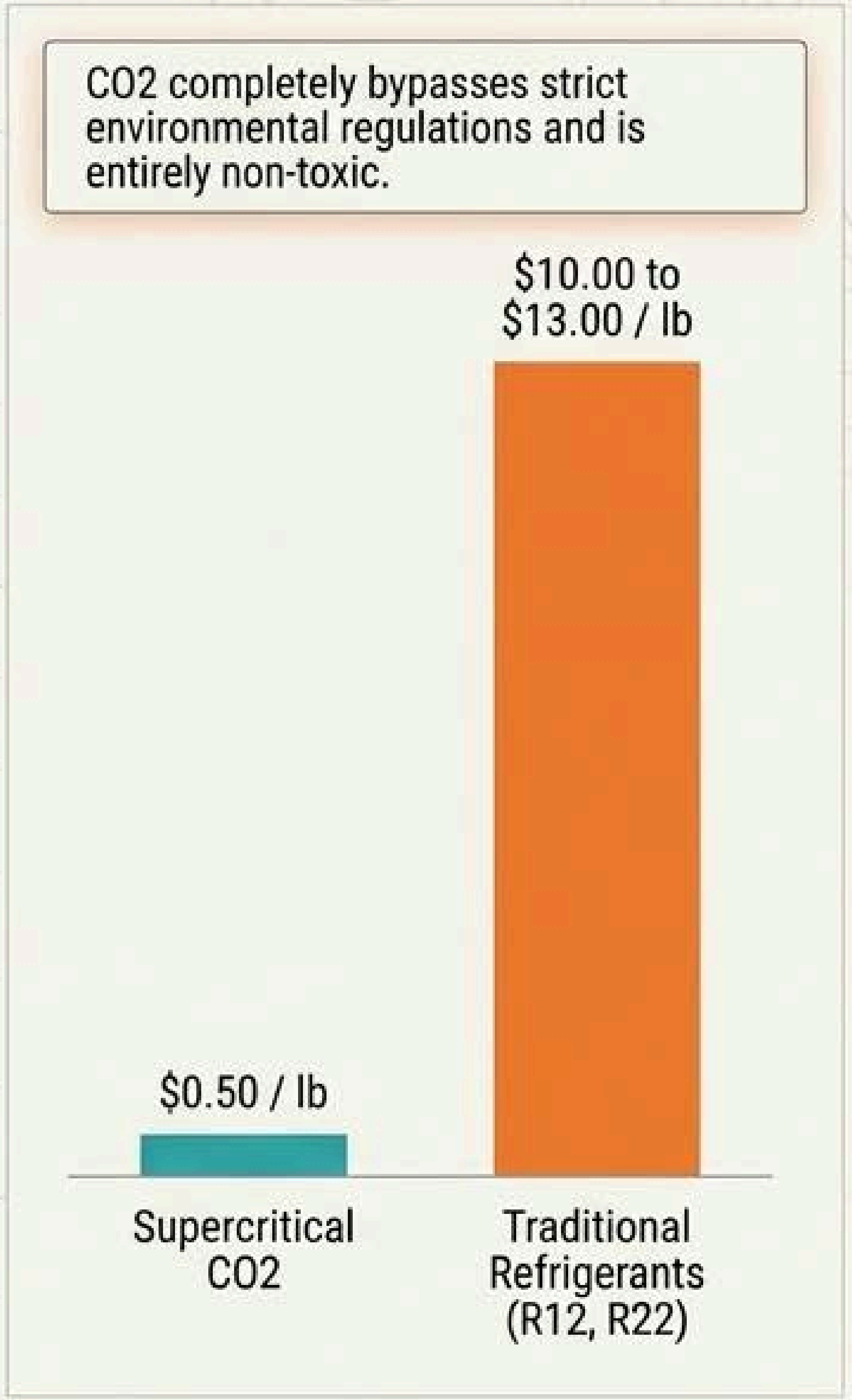


	Silicon Thermal Batteries	Geothermal Wells
Primary Role	Energy Storage & Dispatch	24/7 Baseload Generation
Deployment Geography	Above-ground, portable shipping containers	Deep subsurface drilling and reservoir extraction
Permitting & Complexity	Fast, minimal environmental permitting	Complex, intensive lifecycle and wellfield planning
Output Scale	Modular 1 MW increments	65 to 70 MW high-capacity units

The Common Thread: Both seamlessly integrate into SC CoGen's supercritical CO_2 turbomachinery for highly efficient power conversion.

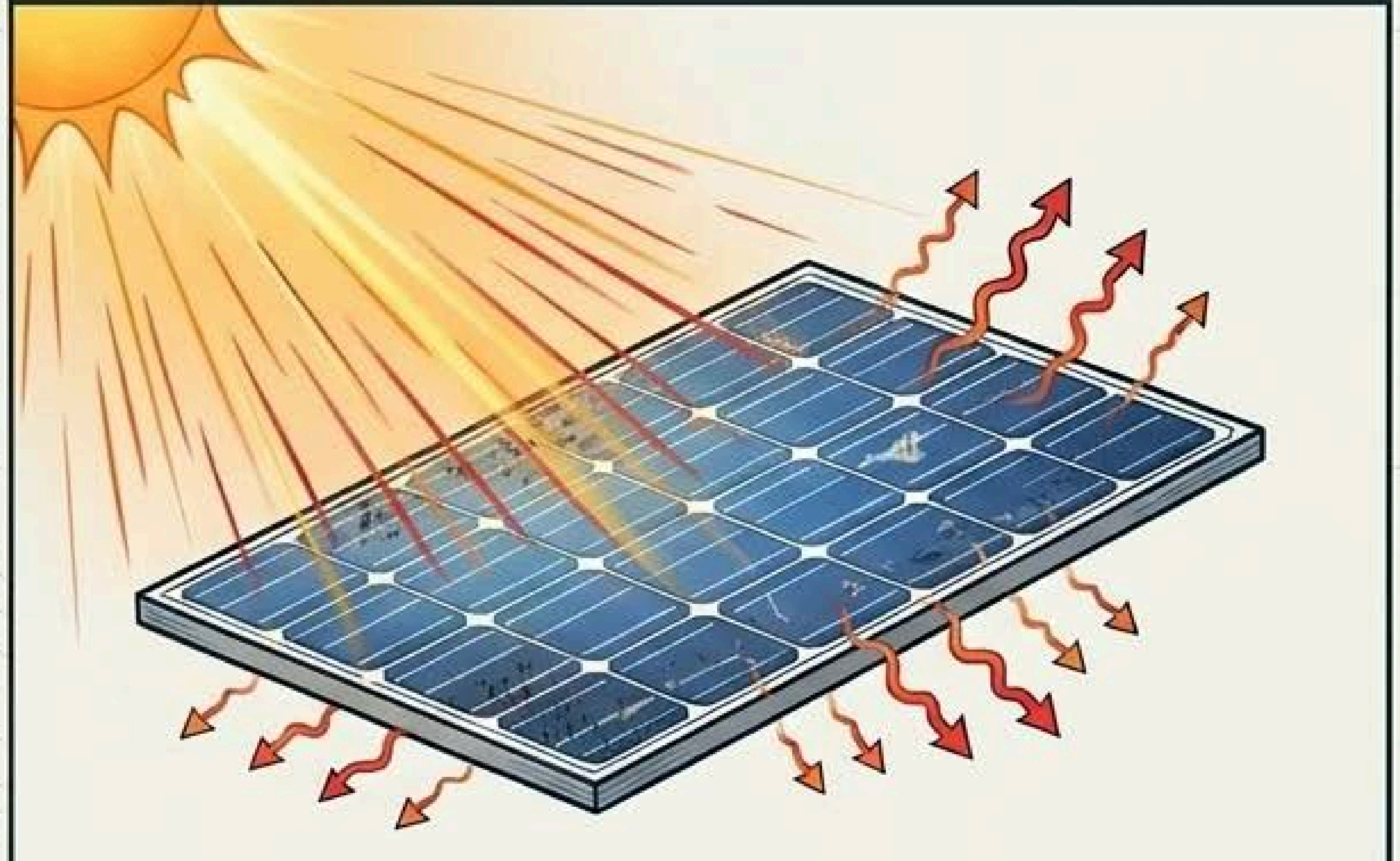
The Closed-Loop Energy Engine: Replacing steam with supercritical carbon dioxide





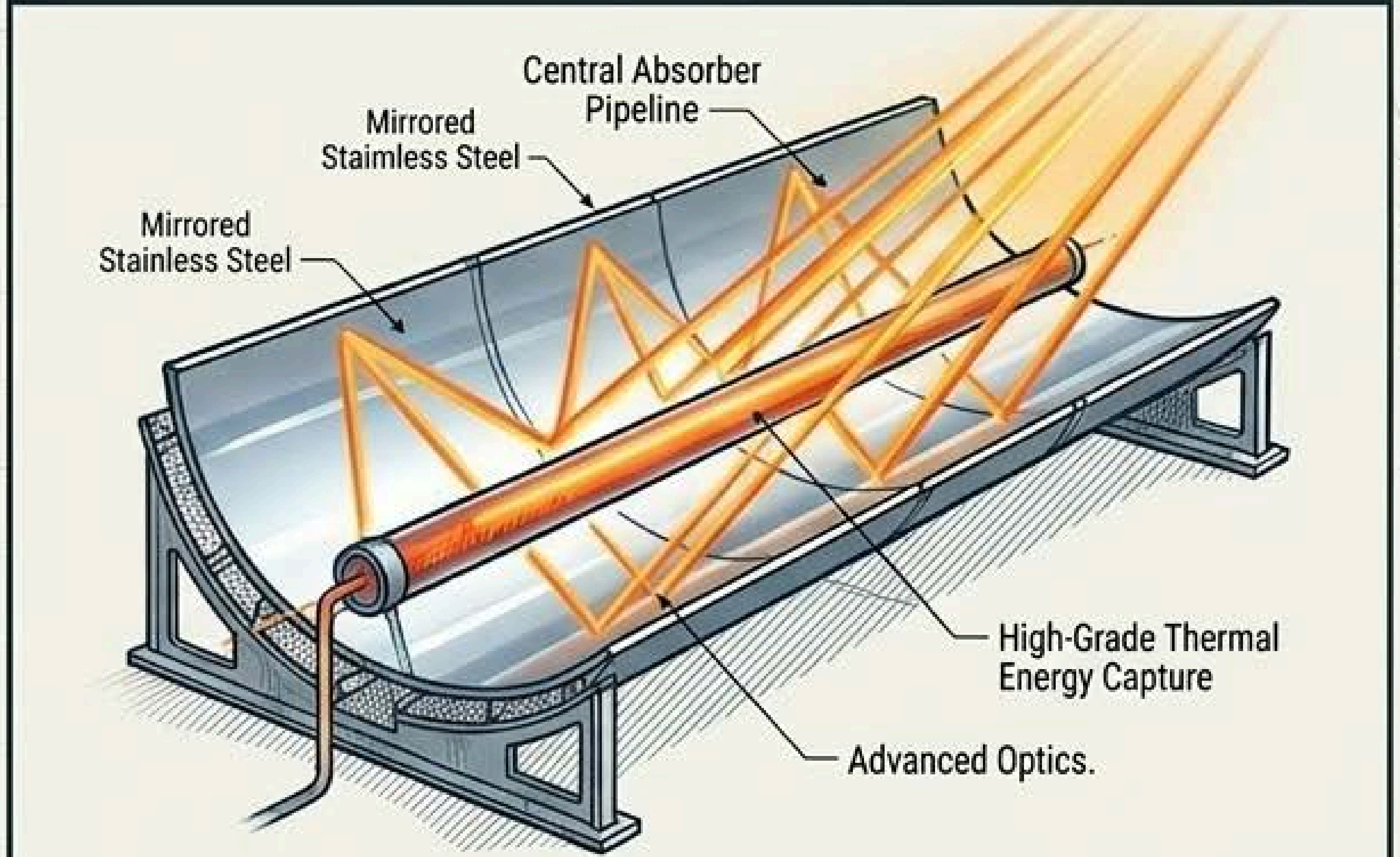
Solving extreme constraints: Capturing the heat index rather than relying on UV light.

The Flaw



Inefficiency and degradation under extreme heat.

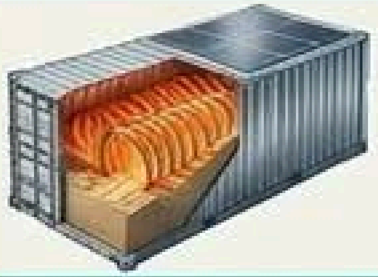
The Paradigm Shift



Advanced optics capture and store high-grade thermal energy.

Density Metrics

Extreme Density:
50+ megawatts of power from just a 5-acre installation footprint.



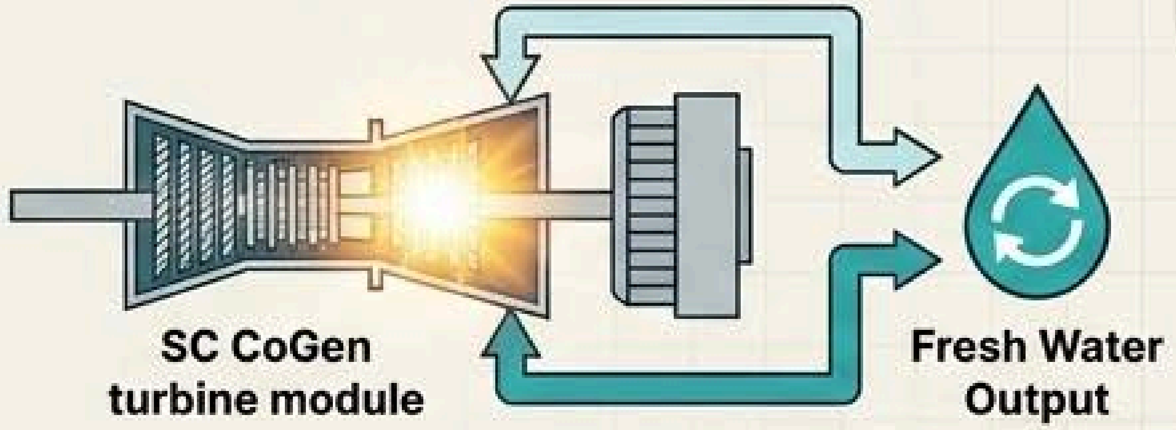
Modular Math:
Exactly three 8x40 shipping containers of pure silica sand provide thermal storage for every 1 megawatt of power output.

Unlocking stalled AI infrastructure:
Turning environmental liabilities into **net-positive** resources

The Problem

The Data Center Dilemma:
80% rejection rate due to extreme grid tension and water consumption limits

The Solution



Planned 9.9 GW natural gas turbine data center unlocked via massive agricultural water recovery from effluent

Water Purification

Proven capability to recover up to 22,000 acre-feet of water from turbine exhaust

Oil Sludge Remediation

High-heat system cleans hazardous sludge, transforming liability into a net-positive revenue stream (active in Texas)

The Financial Engine: Superior sustainability driven by unmatched unit economics.

$1.5M

CapEx per Megawatt.

Allows for highly predictable capital modeling (e. ,
e.g., ~$75M for a massive 50 MW, 5-acre installation).

$0.15

Revenue per kWh.

Reliably secured under long-term, 20-year operational energy delivery contracts.

1 Year

System Payback Period.

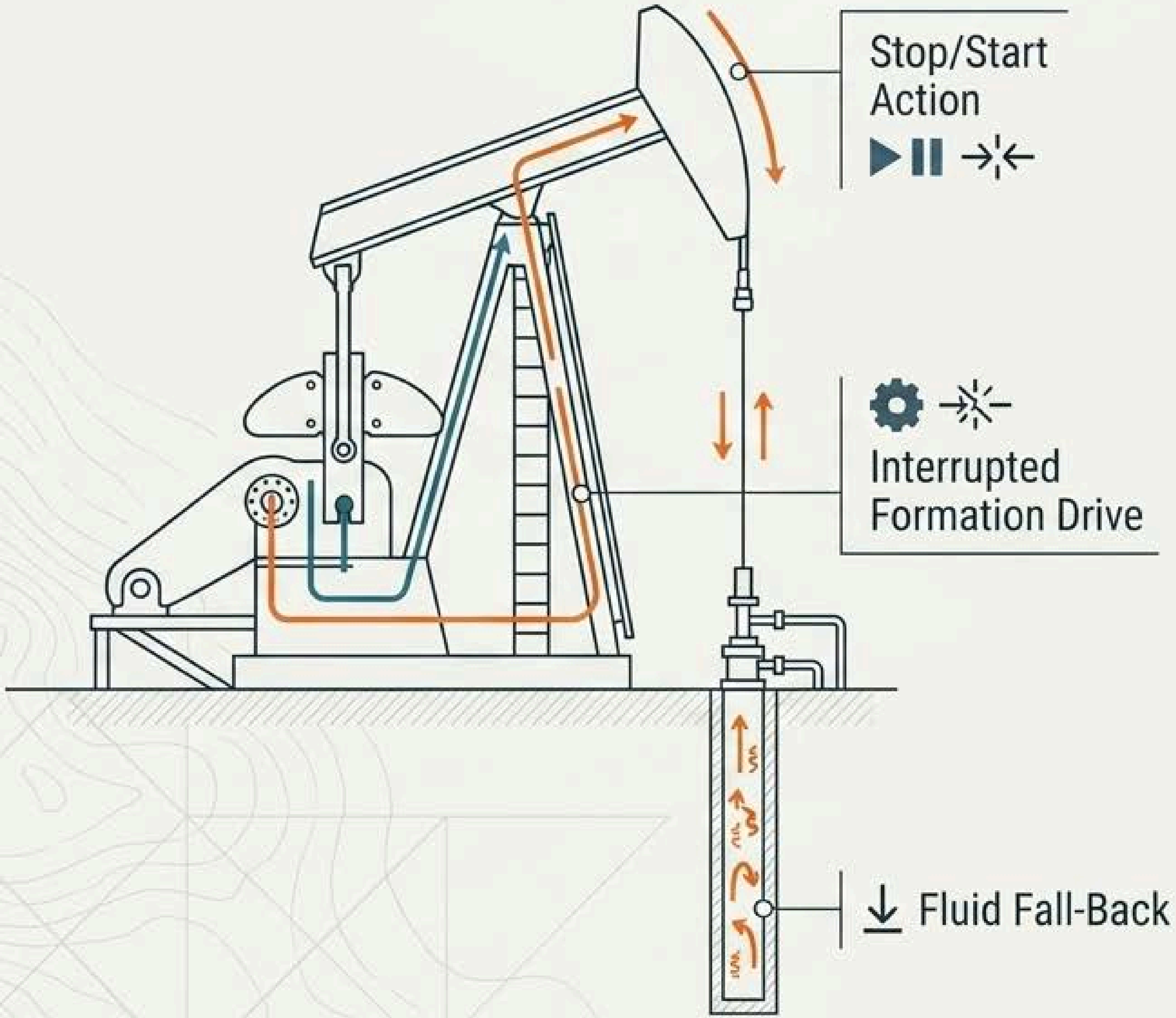
Dramatically accelerated by high thermal efficiency and ultra-low $0.50/lb CO2 fluid costs.

19 Years

Pure Profit Lifecycle.

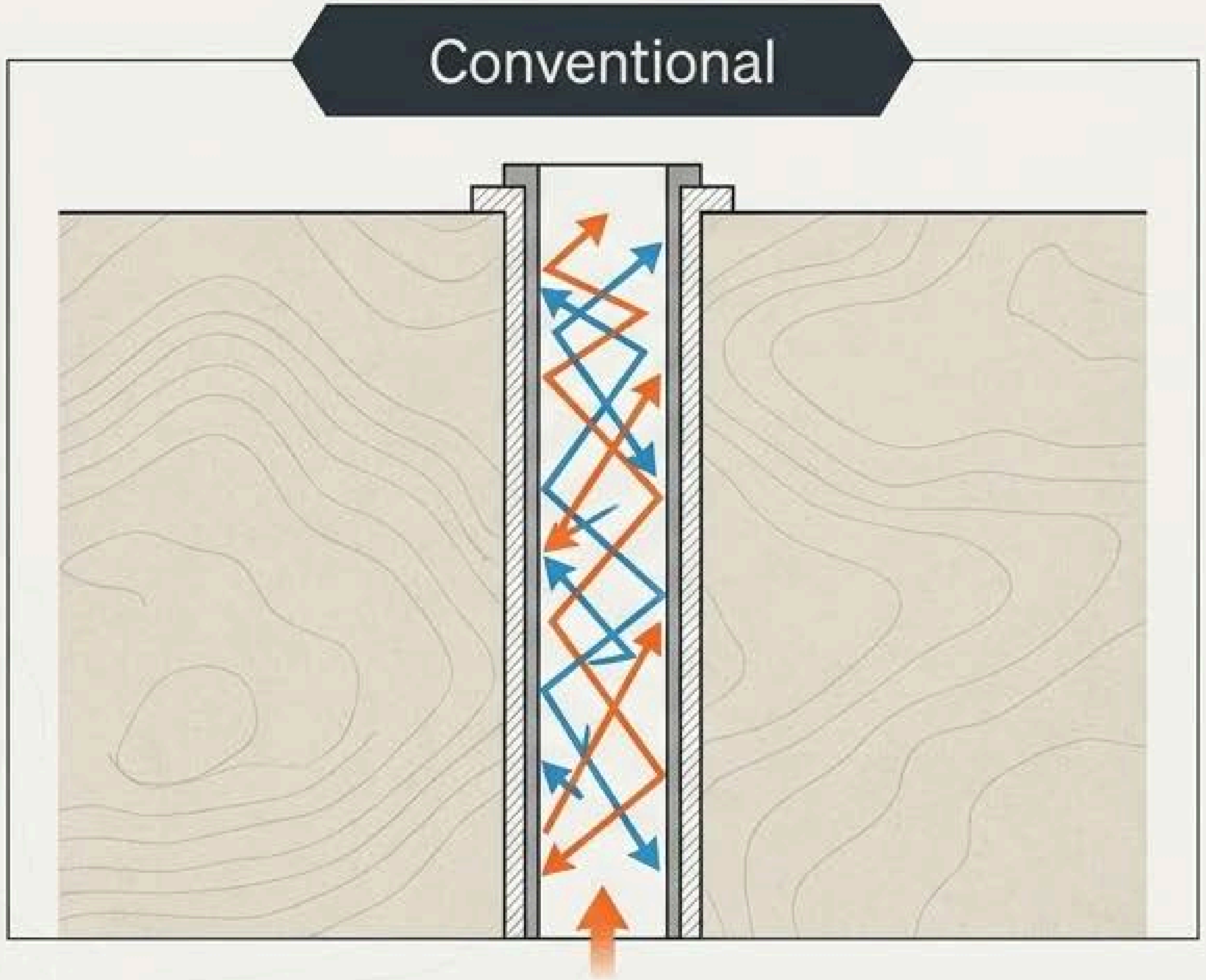
Unprecedented ROI and operational cost stability for institutional infrastructure investors.

The inefficiency of pushing liquids: How interrupted drive throttles extraction potential.

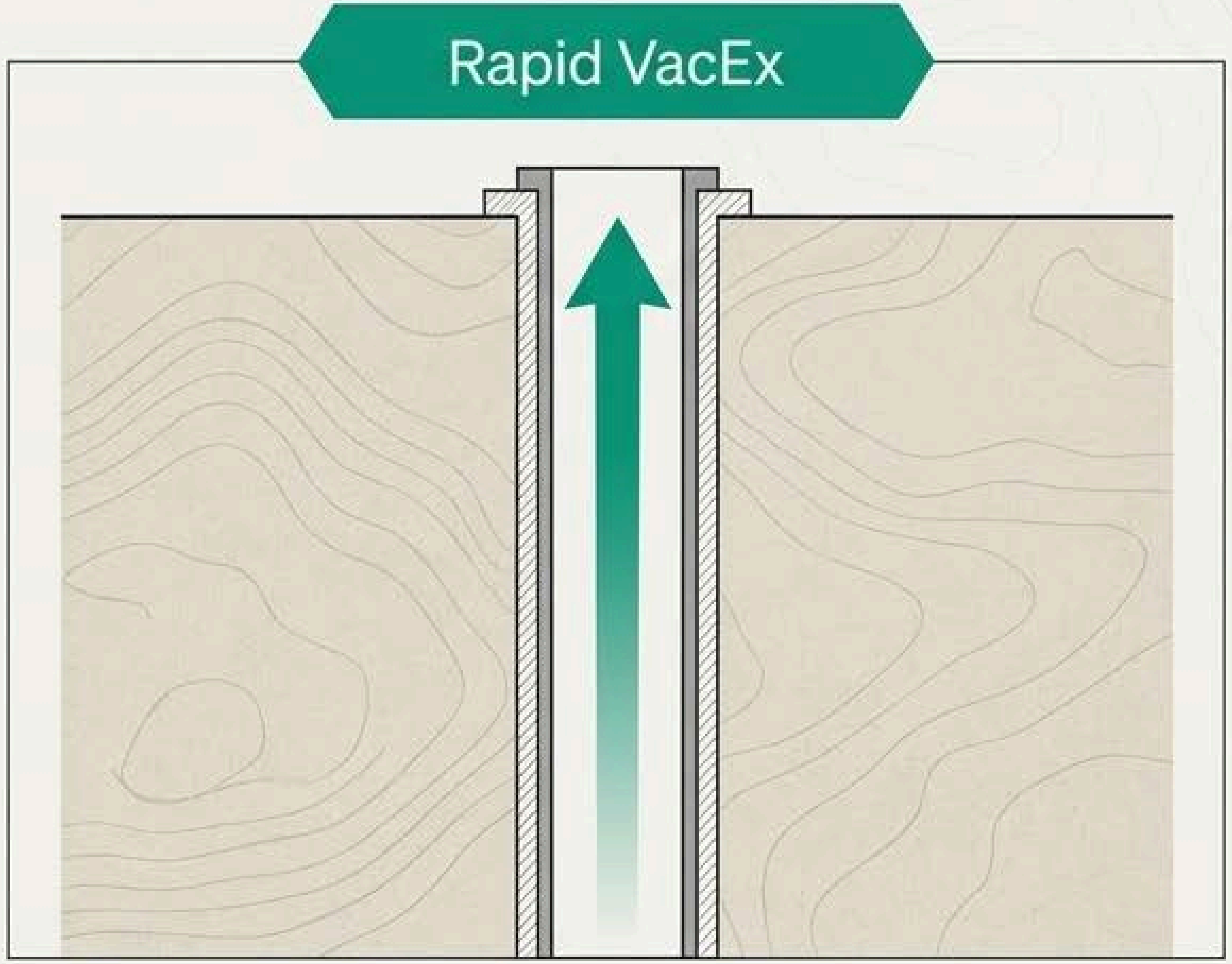


Chain Reaction

The Paradigm Shift: From positive push to continuous negative pull.

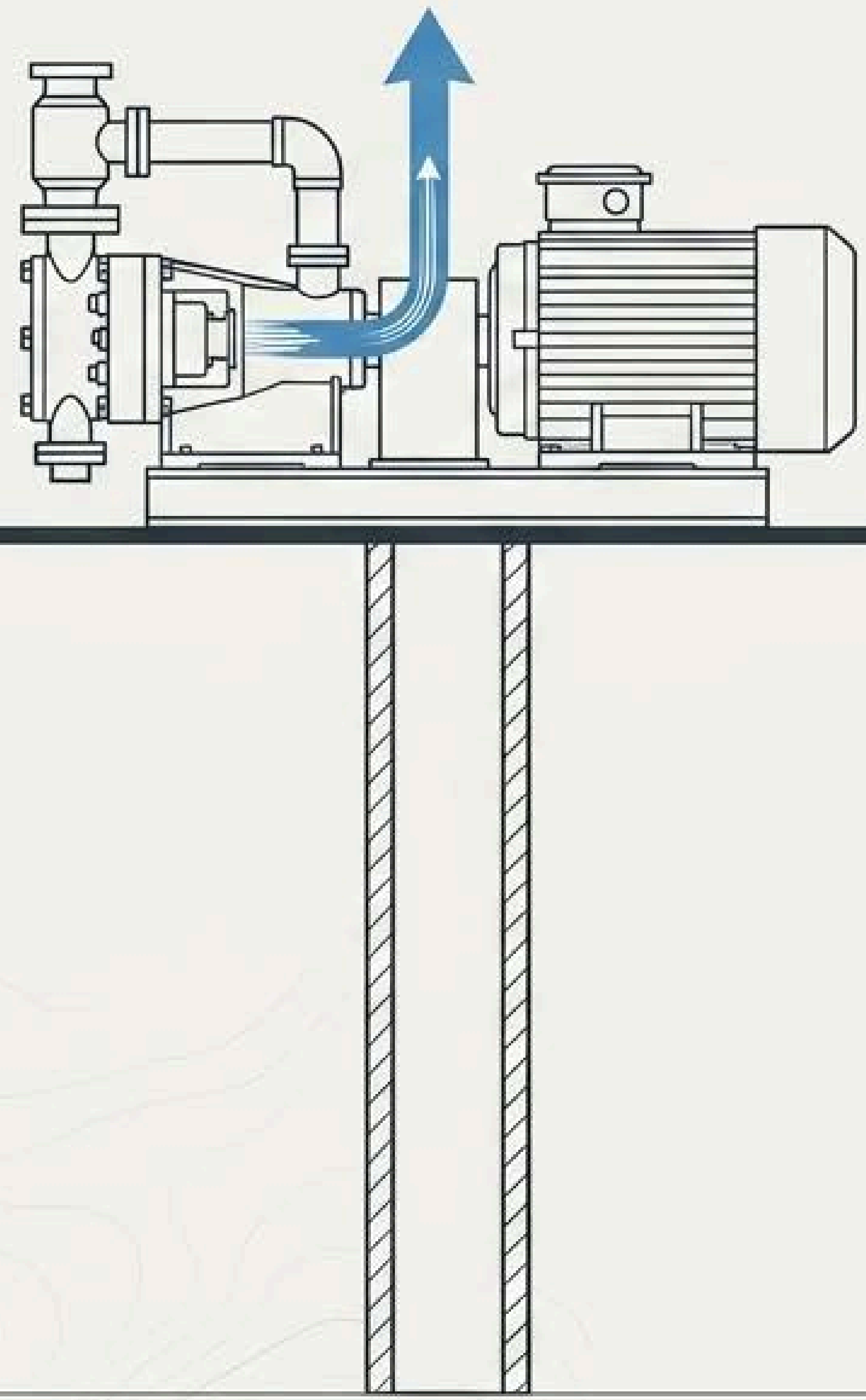


Interrupted Drive: Trying to push fluid through the medium causes pressure spikes and limits marginal well potential.



Continuous Draw: Establishing up to 30 inches of vacuum creates negative pressure, pulling liquids smoothly through the formation.

Spatial Architecture: Relocating reliability entirely to the surface.



Active Control

Driven by electricity, propane, or natural gas. 100% of moving parts are accessible for easy servicing without heavy rigs or downtime.

Passive Extraction

Zero moving parts in the wellbore. Reversible operation allows the pump to clear itself without pulling equipment.

Depth & Power:

Tested to 7,300 ft. Requires only ~13 HP per 1,000 feet of lift.

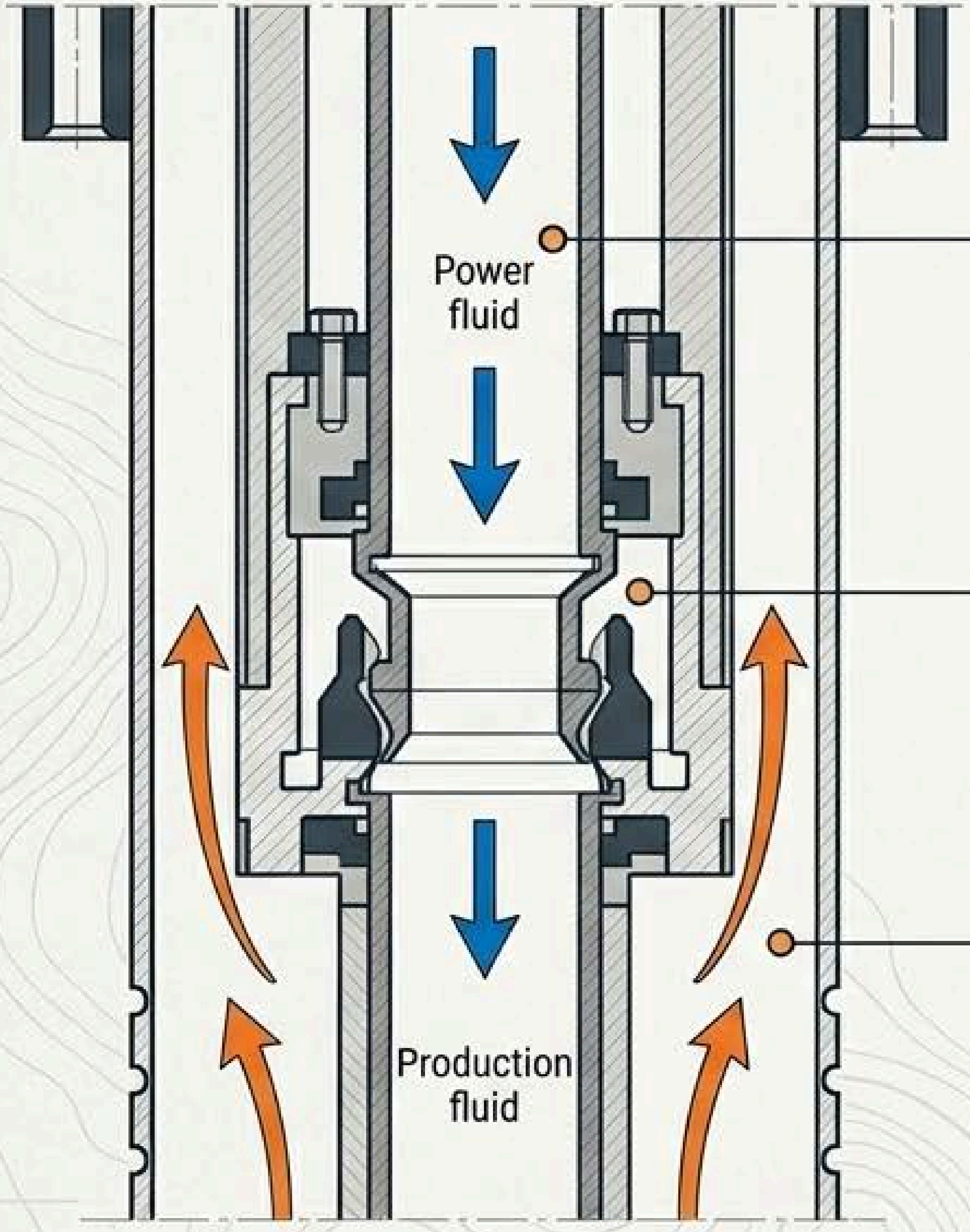
Orientation:

Configurable for vertical, angled, or horizontal installations.

Integration:

Utilizes existing surface tanks. Custom slim-hole 1-inch production tubing available.

The anatomy of yield: Pass-through geometry and thermal velocity



Step 1: Power fluid flows down the inner pipe.

Step 2: Fluid passes through PRDI Jet Pump geometry, creating a powerful vacuum.

Step 3: Production fluid and heavy oil are drawn from perforations and extracted up the annulus.

Pass-Through Capabilities

Heavy Oil
Successfully produces fluid down to 9-10 gravity.

Particulates
Transports sand, mud, and 1/8-inch gravel directly to the surface completely cavitation-free.

Paraffin Elimination
Internal velocity generates sufficient passive heat down-hole to eliminate wax build-up.

Artificial Lift Diagnostic Matrix: Engineering out points of failure.

	Conventional Rod Pump	ESP	Standard Jet Pump	Rapid VacEx
Drive Mechanism	Positive Push, Mechanical ✗	Centrifugal Push ✗	Hydraulic Push ✗	Continuous Vacuum / Pull ✓
Location of Moving Parts	Down-Hole, High Wear ✗	Down-Hole, Complex Electronics ✗	Down-Hole Nozzle ✗	100% Surface Moving Parts ✓
Solids Handling	Causes Abrasive Wear ✗	Limited, Risk of Plugging ✗	Requires Separation ✗	Pass-Through Solids Handling ✓
Paraffin Management	Manual / Chemical ✗	Chemical ✗	Chemical ✗	Internal Thermal Velocity ✓
Power Consumption	High Torque ✗	Very High Power ✗	High Pressure ✗	50-70% Less Power than ESPs ✓

Field performance & the cumulative economics equation.

Nevada, MO

4X

Production increased from 1.5 to 6-10 BOPD.

Burlington, KS

4-6X

Production increased from 1-3 to 12 BOPD.

Lytle, TX

2X

Production increased from 1.5 to 3-4 BOPD (Massive gas increase).

Bradford, PA

24X

Production increased from 0.25 to 12-20 BOPD.

OPEX Reduction (Zero down-hole parts) + **Uptime** (Immunity to sand wear) + **Yield Expansion** (30-inch vacuum draw) = **Transformed Asset Profitability**

The future of infrastructure is frictionless.

Decarbonized.
(Zero-emission closed-loop cycles).

Dispatchable.
(24/7 continuous thermodynamic engines).

Configurable.
(Modular architecture adapting to any depth or geography).

Highly Profitable.
(Unmatched unit economics and yield multipliers).

The closed-loop architecture is established. The market demand is unprecedented. The technology is proven.
Partner with us to engineer your extraction and deploy full-lifecycle power architecture.