

ADVANCED GEOTHERMAL SOLUTIONS

SUSTAINABLE ENERGY.
STRONGER FUTURE FOR THE WORLD.

RePG GEOTHERMAL AGS

POWERING THE WORLD WITH CLEAN,
RELIABLE, 24/7 ENERGY.



R. Rockefeller S.C.

TECHNICAL PARTNER



RePG GEOTHERMAL AGS



CLEAN
BASELOAD
ENERGY



LOW
ENVIRONMENTAL
IMPACT



24/7
RELIABLE
POWER



ENERGY
SECURITY
FOR THE WORLD



SUSTAINABLE
INVESTMENT

WHY GEOTHERMAL AGS?

Advanced Geothermal Systems (AGS) unlock the Earth's natural energy anywhere, anytime. Our closed-loop technology delivers clean, reliable, and sustainable power with minimal surface impact.

- ✓ Zero Emissions
- ✓ Minimal Land Use
- ✓ High Efficiency
- ✓ Scalable & Reliable
- ✓ Future-Proof Energy

ADVANCED GEOTHERMAL SYSTEM (AGS) CLOSED-LOOP TECHNOLOGY

Water is injected into deep, hot fractured rock formations, absorbs heat, and is circulated back to the surface to generate clean, continuous energy.



ENGINEERED FOR THE WORLD
Designed to integrate seamlessly with energy infrastructures and sustainability goals worldwide.



BUILT FOR THE FUTURE
Delivering energy independence, economic growth, and a cleaner tomorrow for generations to come.



**GLOBAL IMPACT,
LASTING VALUE**
World-class technology,
Global commitment.
Lasting impact.

TECHNOLOGY · ENERGY · TRANSITION

Low-temperature geothermal energy becomes global infrastructure

The Organic Rankine Cycle platform that generates electricity from the Earth’s heat starting at 55°C: the AGS technology and its strategic framework in Part One, the industrial recovery of waste heat with the Turkish field evidence in Part Two. This edition integrates the complete visual dossier: eighteen technical plates, from the thermodynamic cycle to the sites photographed as they stand.

55°C	15 +	8-14	-80 %
MINIMUM SOURCE TEMPERATURE, UNIQUE AT TRL 9	MONTHS OF CONTINUOUS OPERATION, HAYAT KIMYA	WEEKS FROM ORDER TO COMMISSIONING	CAPEX PER WELL VS. CONVENTIONAL GEOTHERMAL

1. TECHNOLOGY OVERVIEW

RePG AGS (Advanced Geothermal System) is a proprietary closed-loop geothermal technology that extracts energy from any warm rock formation, at any depth, anywhere in the world.

It requires no water, has zero dry well risk, and achieves up to 80% lower cost compared to traditional geothermal systems.

2. HOW IT WORKS

1. Drilling of two or more wells (typically 1 – 2 km deep)
2. Horizontal connection of the wells in the target warm rock layer
3. Injection of proprietary closed-loop working fluid
4. Heat exchange in the subsurface
5. Fluid returns to surface and transfers heat to power system
6. Fluid is recirculated in a closed loop (no water consumption)

4. SYSTEM DIAGRAM

PART ONE Geothermal energy and Advanced Geothermal Systems (AGS)

PART TWO Industrial applications: the direct recovery of waste heat streams

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Extended Illustrated Edition: eighteen technical plates integrated with the analytical text. Reference RRSC-RP-2026-EN-EXT2.

PART ONE

Geothermal energy and Advanced Geothermal Systems (AGS)

Here the heat is sought underground. The proprietary ORC turbine, the dual closed loop, the 55°C threshold that cuts drilling to roughly 750 metres, the maturity path from TRL 7 to TRL 9, and the strategic framework that makes this technology a declared priority in the United States and the European Union.

IN THIS PART

- 01 The platform and the physical principle: the Organic Rankine Cycle
- 02 Architecture: the dual closed loop, the sealed exchange and the containerised module
- 03 Scaling as topology: the serial and parallel grid architecture
- 04 The 55°C advantage: geography, drilling, capital
- 05 The competitive field, the frontier and the road from pilot to utility scale
- 06 The strategic framework: United States, European Union, the Milazzo anchor

ADVANCED GEOTHERMAL SYSTEMS (AGS)

A STRATEGIC PATHWAY FOR SUSTAINABLE ENERGY

Harnessing the Earth's natural heat through innovation, engineering, and responsible development to deliver reliable, clean, and sustainable energy for the future.



SUSTAINABLE
Reliable, clean energy with a minimal environmental footprint.



SECURE
Domestic, baseload energy that enhances energy independence.



SCALABLE
Modular design supporting future expansion and growth.



COLLABORATIVE
Partnerships and innovation driving long-term success.

OPERATIONAL
COMMENCEMENT
2026



1 MW AGS PILOT PROJECT

- Validating Advanced Geothermal Systems technology in a real-world environment.
- Demonstrating performance, reliability, and scalability.
- Paving the way for commercial-scale deployment.

ENGINEERING CENTER

- Center for design, innovation, and technical excellence.
- Supporting research, development, and operational optimization.
- Preparing the next generation of geothermal solutions.

EXECUTIVE SUMMARY

Two vectors, one platform

A single low-enthalpy ORC architecture that funds its own frontier: commercial industrial installations today, Advanced Geothermal Systems tomorrow.

RePG is a proprietary low-temperature Organic Rankine Cycle platform, engineered by RePG Energy and commercialised worldwide under exclusive rights held by The Rob Rockefeller Standard Carbon LLC. This report is structured in two parts, because the platform has two distinct vectors that share the same physical hardware but address different markets at different stages of maturity.

Part One, Geothermal energy and Advanced Geothermal Systems, sets out the path that extends the same proven turbine towards closed-loop and open-loop AGS. Technical qualification runs through the 1 MW pilot at the Bursa Engineering and R&D Centre, at TRL 7 today and headed for TRL 9 within months; the first field pilot projects are being programmed in Bulgaria, with the Ministry of Energy in Sofia, and in Italy, at Milazzo, under a regional and European programme.

Part Two, Industrial applications, covers the TRL 9 portfolio already in operation: here the heat is not sought underground, it already exists inside the plant as process waste, and the same machine converts it into electricity behind the meter. Part One calls for patient strategic capital and rides the sector’s regulatory tailwinds; Part Two is infrastructure already generating revenue.

Together they form one coherent platform: every new industrial installation generates SCADA data that hardens the engineering of the AGS power block, and every advance of the pilot opens geographies where the industrial portfolio becomes deployable. This extended edition adds the full visual dossier: eighteen plates covering the cycle, the machine, the sites and the strategy, each read in the text that accompanies it.

KEY INSTITUTIONAL DATA

DIMENSION	PART I · GEOTHERMAL / AGS	PART II · INDUSTRIAL
Technology maturity	TRL 7 today, TRL 9 within months	TRL 9, commercial
Investment thesis	Strategic pilot capital	Revenue-generating assets
Deployment timeline	1 MW pilot under construction, commercial 2027+	8-14 weeks from order to COD
Operating proof	AFJET analogue, 15 kWe, 70+ days	Hayat Kimya, 75 kWe, 15+ months
Heat source range	55-120°C (any hot rock)	45-110°C (industrial streams)
Capital intensity	USD 2.8-3.5 million per 1 MWe	USD 2.8-3.5 million per 1 MWe
Regulatory tailwinds	30% ITC preserved through 2033/2036	Section 48E ITC + industrial decarbonisation

THE PRINCIPLE

What it is: the Organic Rankine Cycle explained

A heat engine that turns low-temperature heat into electricity, using a fluid that boils before water does.

The Rankine cycle is the thermodynamic process behind most of the world’s power stations: a fluid is vaporised by heat, the pressurised vapour spins a turbine coupled to a generator, then the vapour is cooled, returns to liquid and the cycle begins again. In the conventional cycle the fluid is water, which boils at 100°C and demands very hot sources.

The Organic Rankine Cycle replaces water with a high-molecular-mass organic fluid, chosen because it evaporates at a far lower temperature. The idea is half a century old and is used above all in geothermal power and industrial waste-heat recovery. The choice of working fluid is decisive: at low temperatures, even small differences in its properties shift efficiency appreciably.

The technical literature places conventional ORC in a window running, depending on the supplier, from 75-150°C up to 300°C. Below 70°C the manufacturers themselves state that the cycle loses economic validity: the parasitic loads of pumps and fans absorb the entire output. This is exactly where RePG’s technological claim sits.

What sets RePG apart from every other ORC supplier in the world is the temperature window: it operates efficiently from 55°C. This single engineering property is the foundation of the entire commercial opportunity, because it moves the boundary between usable heat and lost heat: it turns streams the industry writes off as thermally exhausted into fuel.

COMPETITIVE LANDSCAPE IN THE 55-70°C SEGMENT

TECHNOLOGY	OPERATES AT 55-70°C?	MATURITY
Conventional ORC (Ormat, Turboden)	No, not designed for this band	Not applicable
ElectraTherm	No, 77°C minimum	Below threshold
Climeon	No, 75°C minimum	Below threshold
Heat pumps	COP below 1 in this regime	Net energy loss
Next-gen AGS (Fervo, Eavor, Sage)	No, targeting 150°C and above	Different segment
RePG	Yes	TRL 9, 15+ months continuous

The 55-70°C segment is therefore structurally uncontested: traditional ORC suppliers cannot operate there economically, and advanced-geothermal developers are absent because they target high temperatures.

THE CYCLE IN DETAIL

The thermodynamic cycle, station by station

Why an organic fluid, what happens at every station of the loop, and where the physical limits sit. Conditions shown are illustrative; exact parameters are fluid- and site-specific.

Three properties make the working fluid the heart of the machine. Its boiling point sits far below 100°C, so even a 55-70°C source drives full evaporation. Its saturation curve slopes the right way, so the vapour expands dry, with no droplet erosion of the expander. And its high molecular mass shrinks the enthalpy drop, allowing a compact single-stage expander instead of a multi-stage steam train. RePG works with R245fa-class fluids, with final selection per application and band.

The loop itself has four stations. The feed pump pressurises the liquid; the plate evaporator boils it with a pinch of 5-10 K below the source; the expander converts vapour enthalpy to shaft power on a direct-driven generator; the condenser closes the cycle at roughly 10-15 K above ambient, in air on the 15 kWe class and in water on the 75 kWe class.

The physics, stated plainly. Net efficiency is $\eta = W_{\text{net}} / Q_{\text{in}}$, and the theoretical ceiling is Carnot, $\eta_C = 1 - T_c/T_h$ in kelvin: 12.2% for a 55°C source against a 15°C sink. Real machines at these temperatures deliver 5-7% net; AFJET measures 7.2% at 72-75°C. With free fuel, the economics turn on cost per installed kW and on hours, not on the efficiency figure.

Control is what turns the cycle into a product: pinch tracking on the evaporator, load-following on the expander, an automatic bypass that isolates the unit without touching the host process, and one-minute cloud telemetry on every station.

STATION BY STATION (ILLUSTRATIVE CONDITIONS)

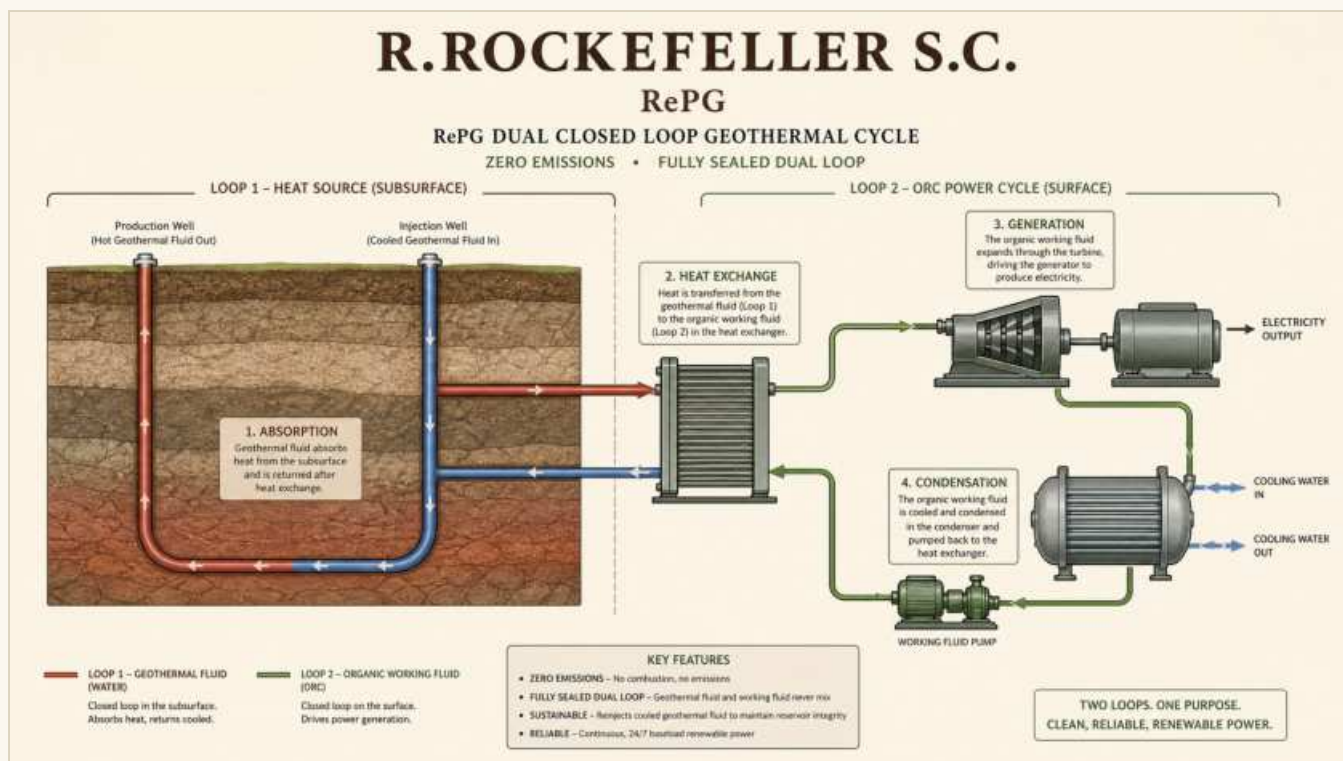
STATION	STATE OF THE WORKING FLUID	ENGINEERING NOTE
1 · Pump outlet	Subcooled liquid, high pressure	Feed pump raises pressure; its load is included in every net figure quoted
2 · Evaporator outlet	Saturated vapour	Plate exchanger; pinch 5-10 K below the heat source
3 · Expander outlet	Low-pressure vapour	Single-stage dry expansion; direct drive to the generator
4 · Condenser outlet	Saturated liquid	Air-cooled (15 kWe class) or water-cooled (75 kWe class); ambient sets the cold end

Net efficiency $\eta = W_{\text{net}} / Q_{\text{in}}$; theoretical ceiling $\eta_C = 1 - T_c/T_h$ (kelvin), equal to 12.2% for 328 K against 288 K. All formulas are collected and verified in the methodological annex.

HOW IT WORKS · PLATE 1

The dual closed loop: four stages, zero emissions

Loop 1 is the heat source. Loop 2 is the ORC power cycle. Nothing is released into the environment.



Loop 1 carries the heat from the source; Loop 2 is the sealed ORC power cycle, with an organic fluid that boils at low temperature. The two loops exchange energy through a plate heat exchanger and never mix. Source: RePG / The Rob Rockefeller S.C.

Stage 1, absorption. A primary fluid, typically water, runs through a sealed piping loop that descends underground, warming by conduction from the rock to temperatures as low as 55°C. The fluid never touches the environment: it works as a conveyor belt for heat.

Stage 2, heat exchange. The warmed fluid rises and transfers its energy, through a plate heat exchanger, to a secondary organic fluid that evaporates at a very low temperature.

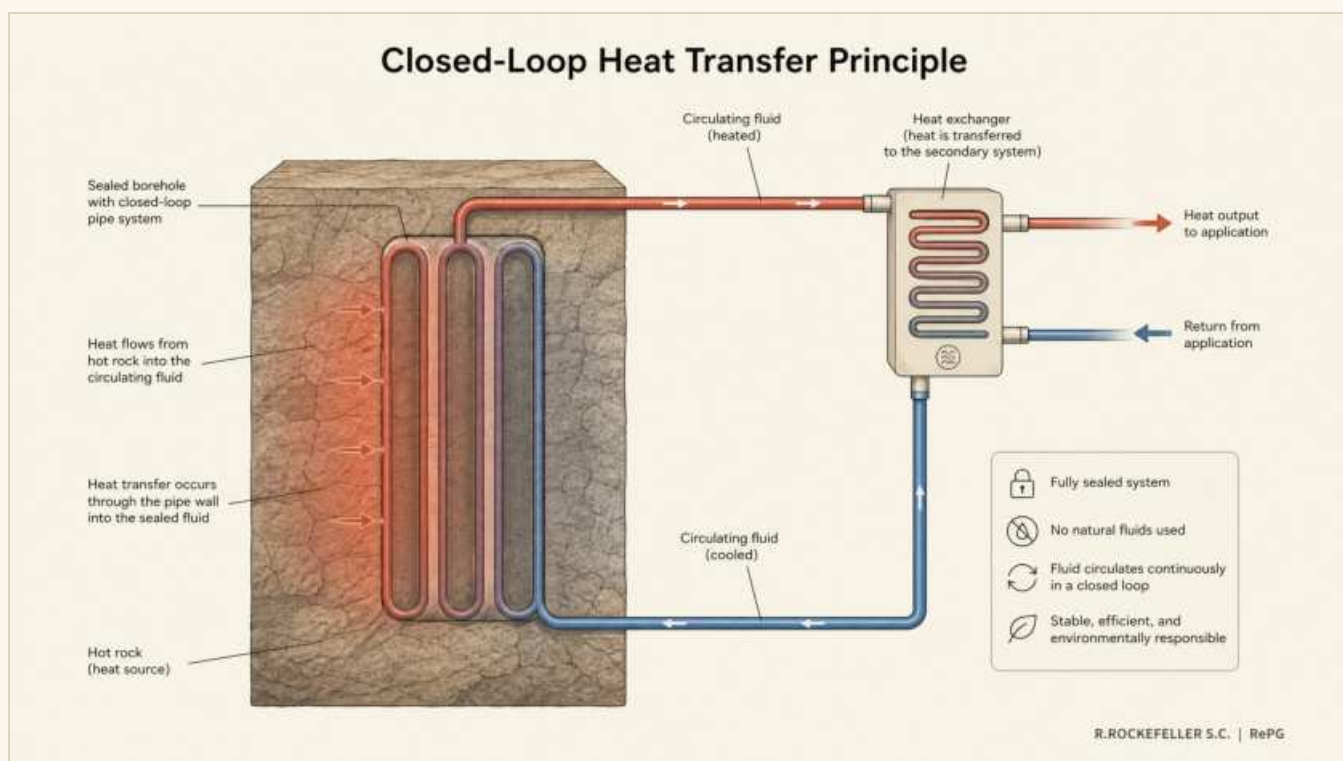
Stage 3, generation. The secondary fluid, now high-pressure vapour, spins the turbine driving the generator: the electricity is ready for the grid or for self-consumption by an industrial site or a data centre.

Stage 4, condensation. Having yielded its energy, the vapour is cooled, returns to liquid and re-enters the exchanger. The result is a perpetual, self-sustaining and entirely clean cycle: no combustion, no emissions, and cooled geothermal fluid reinjected to preserve the integrity of the reservoir.

INSIDE THE EXCHANGE • PLATE 2

The physics of the sealed loop: heat crosses, matter never does

Conduction through the pipe wall is the whole trick: the circulating fluid takes the rock's heat without ever taking the rock's water, chemistry or risk.



The closed-loop heat-transfer principle: a sealed borehole with a closed-loop pipe system, heat flowing by conduction from the hot rock through the pipe wall into the circulating fluid, and a surface heat exchanger delivering the output to the application. Fully sealed system, no natural fluids used. Source: RePG / The Rob Rockefeller S.C.

Everything the platform promises downstream begins with what does not happen at the pipe wall. The circulating fluid is charged once and sealed; heat migrates across the wall because the rock is hotter, and the fluid rises carrying that energy to the surface exchanger. There is no mass exchange with the formation: no brine enters the circuit, no fluid is lost to it, no make-up water is consumed.

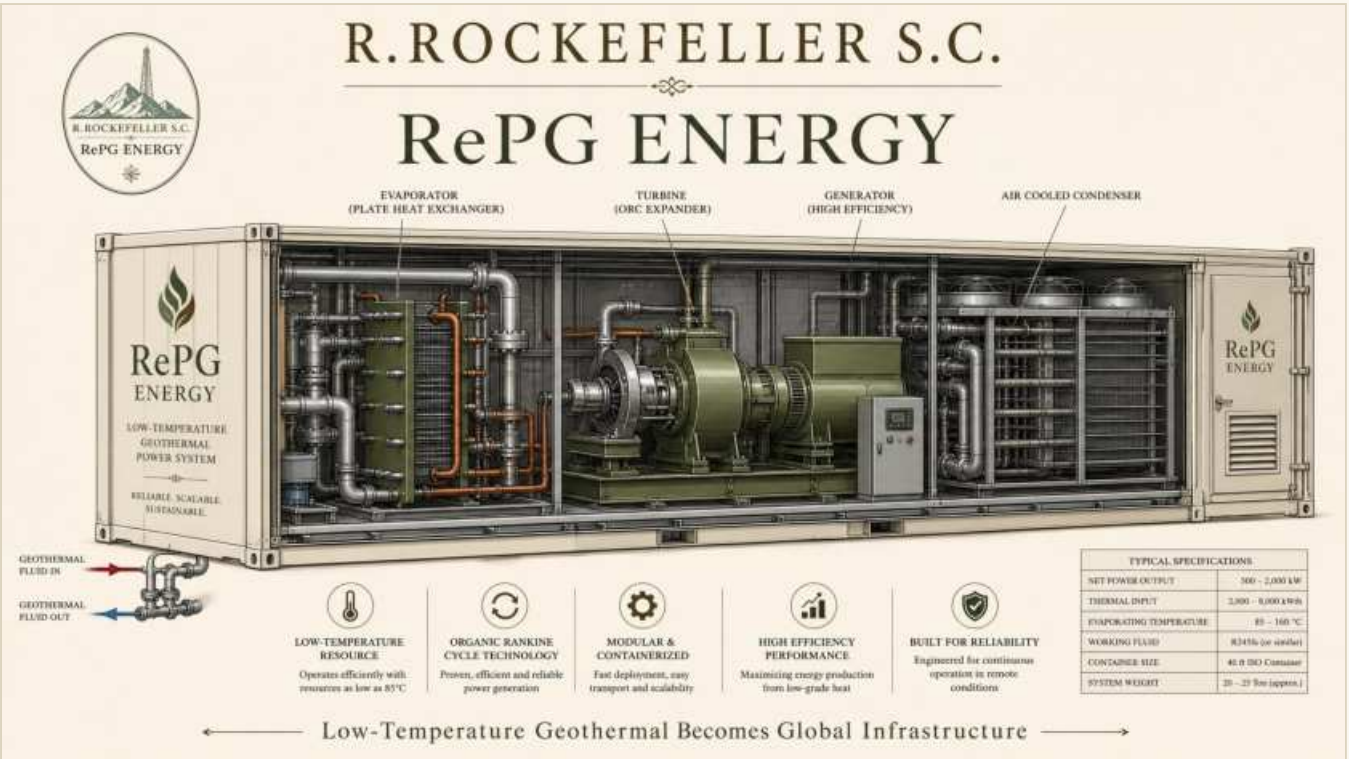
The engineering consequences are direct. Scaling and corrosion chemistry, the historical maintenance burden of open geothermal brines, never reaches the machine, because the machine never touches the brine. The resource question collapses from "is there an aquifer" to "is there rock at temperature", which below one kilometre is almost everywhere true. And the harvest is self-regulating: conduction replenishes the rock around the loop, so contact length, spacing and flow are sized for a sustainable thermal draw over the life of the asset.

The same sealed logic repeats at the surface: the working fluid of the ORC is itself a closed, hermetic, leak-monitored circuit. Two loops, one interface, zero release: the architecture that Plate 1 shows as a system, this plate shows as physics.

THE MODULE · PLATE 3

Inside the container: five subsystems, one factory product

Heat exchanger, organic-fluid circuit, ORC expander, generator and control system, delivered in an ISO frame ready for service.



The containerised RePG geothermal module in cutaway: plate evaporator, ORC turbine-expander, high-efficiency generator and air-cooled condenser. Utility configuration in a 40 ft ISO container: net output 500-2,000 kW, thermal input 2,000-8,000 kWth, evaporating temperature 85-160°C, weight 20-25 tonnes. Source: RePG / The Rob Rockefeller S.C.

THE MODULE CLASSES IN COMMERCIAL SERVICE

PARAMETER	15 KWE UNIT (AFJET)	75 KWE UNIT (HAYAT KIMYA)
Footprint (L × W × H)	1,250 × 2,500 × 2,000 mm	2,200 × 3,500 × 3,000 mm
Weight	1,950 kg	4,500 kg
Condensing	Air-cooled, no cooling water	Water-cooled with evaporative tower
Proven thermal band	45-75°C (geothermal reinjection)	70-110°C (industrial waste heat)
Measured net output	11.7 kW average; 12.7 kW peak	50.5 kW continuous (67.6 kW gross)
Daily energy	circa 281 kWh	1,100-1,250 kWh
Order to service	8-14 weeks	8-14 weeks

A 1 MWe plant corresponds to roughly 13-14 units of 75 kWe in parallel: scaling is the replication of a factory product, not redesign.

INSIDE THE MACHINE

Component by component: engineering characteristics

Five subsystems, each specified for the low-temperature regime. Every net figure in this report already includes their parasitic loads.

Honesty about parasitics is the discipline of low-temperature ORC. Pumps and fans consume a meaningful share of gross output at these temperatures, which is exactly why conventional designs stop being economic below 70°C. RePG quotes net numbers only: at Hayat Kimya, 67.6 kW gross and 17.1 kW of parasitic loads yield the 50.5 kW net that appears throughout this report.

The second discipline is the factory. Every unit is built, charged and tested as a complete machine before shipping, with a factory acceptance test on the real hardware. What reaches the site is a finished product: site works reduce to a concrete pad, hydraulic tie-ins to the exchanger, a low-voltage connection and a data link.

THE FIVE SUBSYSTEMS

SUBSYSTEM	ROLE	ENGINEERING CHARACTERISTICS
Plate evaporator	Transfers source heat to the working fluid	Low pinch, low pressure drop; standard flanged tie-in; serviceable on fouling streams
Turbine-expander	Converts vapour enthalpy to shaft power	Single-stage machine optimised for the small enthalpy drop of low temperatures; dry expansion
Generator	Shaft power to grid-quality electricity	High-efficiency alternator, grid-parallel, low-voltage, behind the meter
Condenser	Closes the loop	Air-cooled on the 15 kWe class (zero water); water-cooled with tower on the 75 kWe class
Working-fluid loop	Carries the cycle	Hermetic, leak-monitored, R245fa-class charge selected per application
Control and SCADA	Operates and protects	PLC control, automatic fail-safe bypass, remote operation, one-minute Splunk Cloud telemetry

WHAT ARRIVES ON SITE

ITEM	AS DELIVERED
Factory acceptance test	Completed on the actual unit before shipment
Containerised frame	1,250 × 2,500 × 2,000 mm (15 kWe) · 2,200 × 3,500 × 3,000 mm (75 kWe)
Weight	1,950 kg (15 kWe) · 4,500 kg (75 kWe)
Tie-ins required	Hydraulic to the exchanger, low-voltage electrical, data link
Site works	Concrete pad and routing only; no process modification

FIELD ARCHITECTURE · PLATE 4

Scaling as topology: the serial and parallel grid connection

A field of RePG units is piping and switchgear, not new engineering: units cascade in series along the temperature drop, multiply in parallel along the flow, and synchronise behind one smart meter.



The RePG grid-connection scheme, serial and parallel: hot and cold water lines feeding a bank of identical units, with a three-phase 400 V electric panel and a two-way smart grid meter closing the electrical side. Source: RePG Energy engineering documentation.

Hydraulically, the two topologies answer two different questions. Parallel connection shares the source flow among identical units at a common inlet temperature: it is the capacity play, and it is how a 1 MWe plant becomes 13-14 units of 75 kWe on one manifold. Serial connection cascades units along the temperature drop, each stage extracting its slice of the available dT: it is the exergy play, used where flow is limited but the stream arrives hot and can usefully be discharged much cooler.

Electrically, every unit synchronises grid-parallel on the low-voltage panel, three-phase 400 V, and the plant faces the site through a single two-way smart meter: self-consumption first, export where the regime allows it, one metering point for the whole bank.

Operationally, the topology is the availability strategy. A bank of N identical machines is intrinsically N+1: any single unit can be bypassed, serviced or swapped while the rest of the field runs, and the automatic bypass guarantees the host process never registers the event. Growth, redundancy and maintenance all reduce to the same object: one more container on the manifold.

THE ADVANTAGE · PLATE 5

The property that changes everything: operating from 55°C

Conventional geothermal demands over 150°C and volcanic geology. RePG works with heat at 55-80°C, available almost everywhere.

TRADITIONAL GEOTHERMAL vs REPG ENERGY		
LOWER TEMPERATURE. HIGHER MATURITY. LOWER COST.		
METRIC	TRADITIONAL GEOTHERMAL	REPG ENERGY
 MINIMUM SOURCE TEMPERATURE (°C)	150°C	55°C LOWER TEMPERATURE GREATER RESOURCE ACCESS
 TECHNOLOGY READINESS LEVEL (TRL)	LOWER GREATER TECHNICAL RISK	TRL 9 PROVEN. OPERATIONAL. BANKABLE.
 CAPEX PER WELL	HIGH HIGHER CAPITAL INVESTMENT	-80% SIGNIFICANTLY LOWER CAPEX

Traditional versus RePG: temperature threshold, technology maturity and capital per well. Lower temperature, higher maturity, lower cost. Source: RePG / The Rob Rockefeller S.C.

Geographic universality. Heat between 55 and 80°C is available at depths below one kilometre almost everywhere, around 750 metres in the target geologies: the dependence on volcanic geology that confined geothermal for half a century disappears.

Universality of heat streams. Industrial waste heat in the 55-110°C band is the single largest source of unrecovered energy in the global economy, largely written off as thermally exhausted by the ORC industry itself. It is the subject of Part Two.

Data-centre compatibility. Server cooling loops reject heat at 55-70°C, exactly the RePG window, which no competing technology addresses commercially today.

The physics, honestly. At 55°C the Carnot limit is about 12% and a real machine delivers single digits: but the fuel is free and already present, so the economics turn on cost per installed kW and on operating hours, not on thermal efficiency. AFJET delivers 7.2% net at 72-75°C, outstanding for this thermal class.

THE ECONOMICS OF DEPTH

An order-of-magnitude advantage in drilling and CAPEX

The RePG window, from 55°C, needs roughly 750 metres: ten times less depth and about 80% less capital per well-equivalent.

GEOTHERMAL ARCHITECTURES COMPARED

PARAMETER	TRADITIONAL	NEXT-GEN AGS	REPG AGS
Subsurface temperature	200-300°C	150°C and above	55-120°C
Drilling depth	5-7 km	3-7 km	circa 750 m
CAPEX per well-equivalent	USD 20-30 million	USD 8-15 million	USD 2.8-3.5 million
Dry-well risk	circa 1 in 3	reduced	zero by design
Water dependence	high	variable	none (closed loop)
Time to power	18+ months	6-12 months	3-4 months
Geographic constraint	volcanic zones	mid-temperature zones	global, below 1 km

In deep geothermal, drilling absorbs one half to two thirds of total project capital: it is the well, not the turbine, that decides the economics. Next-gen figures derive from disclosed funding rounds used as proxies; RePG’s advantage is structural, not a site-execution assumption.

A 750-metre well is water-industry work: standard rigs, local contractors, days instead of months. And with free fuel, LCOE is dominated by capital amortisation: cutting well cost by 80% compresses it as no cycle optimisation ever could.

THE COMPETITIVE FIELD IN ADVANCED GEOTHERMAL

DEVELOPER	ARCHITECTURE	DISCLOSED FUNDING	NOTES
Fervo Energy	EGS, horizontal drilling	circa USD 1.6 bn	USD 462 m round, Dec. 2025
Eavor Technologies	Deep closed-loop AGS	circa USD 182 m	Multiple international rounds
Sage Geosystems	Pressure geothermal storage	circa USD 30 m	Series A, 2024
XGS Energy	Closed-loop AGS, advanced fluids	circa USD 30 m	Khosla Ventures
Quaise Energy	Millimetre-wave drilling	circa USD 95 m	MIT spin-out, deep horizon
RePG	Low-enthalpy ORC, sub-1 km AGS	n.a.	Only TRL 9 below 80°C

None of the six developers operates commercially in the distributed segment below 80°C: all target centralised generation above 150°C. Source: public statements and disclosed rounds, Q1 2026.

THE COMPETITIVE FIELD · PROFILES

The advanced-geothermal field, developer by developer

Serious capital validating the geothermal thesis, all of it aimed above 150°C. Profiles compiled from public disclosures, Q1 2026.

Fervo Energy. Around USD 1.6 billion in disclosed funding, including a USD 462 million round in December 2025. Enhanced Geothermal Systems with horizontal well pairs, flagship development in Utah, utility-scale power sold under long-term agreements. Target: 150°C and above at 3-7 km.

Eavor Technologies. Around USD 182 million disclosed. Deep sealed-loop radiator (Eavor-Loop) with projects in Europe and Canada; no fracturing, but kilometres of drilling per loop keep it firmly in the deep, centralised class.

Quaise Energy. Around USD 95 million. MIT spin-out developing millimetre-wave drilling to reach superhot rock at depths conventional bits cannot economically touch. The longest technical horizon in the field.

Sage Geosystems. Around USD 30 million. Pressure geothermal for storage and generation in Texas, aimed at utility and defence offtakers.

XGS Energy. Around USD 30 million, backed by Khosla Ventures. Water-based conductive closed loops targeting hot dry rock at depth.

GreenFire Energy. Around USD 25 million. Closed-loop retrofit (GreenLoop) of existing and idle high-temperature wells: adjacent in method, still bound to already-hot resources.

READ-THROUGH FOR REPG

QUESTION	ANSWER	CONSEQUENCE
Where do the six compete?	Utility-scale generation above 150°C at 3-7 km	A segment RePG does not contest
Where does RePG compete?	Distributed power below 80°C; AGS below 1 km	Structurally uncontested today
What does the capital prove?	Institutional conviction in geothermal as an asset class	A tailwind for the whole sector, RePG included

Funding figures are cumulative public disclosures used as proxies for scale. None of the six operates commercially below 80°C; none markets a distributed, behind-the-meter product.

THE COMPETITIVE FIELD · POSITIONING

Why the band below 80°C stays open

Incumbent ORC suppliers, the new-generation developers and adjacent technologies each have structural, not accidental, reasons never to descend into this window.

The incumbents. Ormat and Turboden built world-class machines for roughly 100°C and above; ElectraTherm and Climeon reach down to 77°C and 75°C. Below that, their architectures stall: expanders and cycles tuned to larger enthalpy drops see parasitic loads swallow the output. Descending is not a derating of an existing product; it is a new machine, a redesign the installed-base economics of an incumbent rarely justify.

The new generation. Fervo, Eavor and their peers carry capital stacks in the hundreds of millions that require utility-scale offtake to repay. Their product is the deep well itself. A distributed, sub-80°C, behind-the-meter machine is a different product, a different sales channel and a different unit economics; their structure points them away from this band, not into it.

Adjacent technologies. Heat pumps move heat by consuming power; as a generation pathway below 80°C they are a net energy loss. Thermoelectrics remain far from commercial efficiency at scale. There is no adjacent route into the band.

The moat. Minimum-temperature engineering took years to prove, and the proof compounds: every hour of SCADA data from every installation raises the bar a newcomer must clear. First-mover advantage here is measured in operating hours, and the counter has been running continuously since December 2024.

POSITIONING MAP: MINIMUM ECONOMIC SOURCE TEMPERATURE

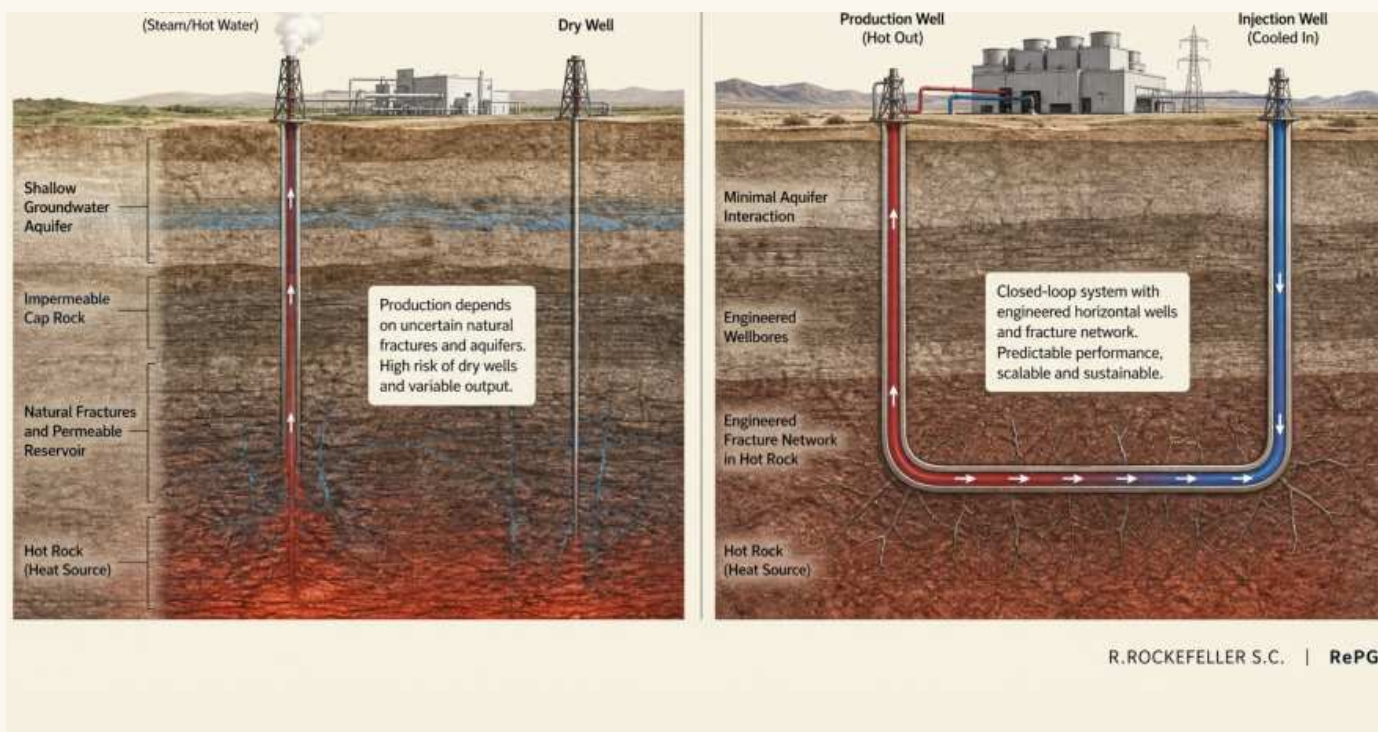
TECHNOLOGY	MINIMUM ECONOMIC SOURCE	PROOF BELOW 80°C
Ormat, Turboden (conventional ORC)	circa 100-150°C by design	None
ElectraTherm	77°C	None
Climeon	75°C	None
Heat pumps	n/a: consume power to move heat	Not a generation pathway
Fervo, Eavor, Sage, XGS, Quaise, GreenFire	150°C and above	None
RePG	55°C	TRL 9 · 15+ months · public SCADA

Sources: supplier public specifications and disclosures, Q1 2026; RRSC analysis.

THE FRONTIER · PLATE 6

From proven ORC to Advanced Geothermal Systems

The same turbine, applied to a heat exchanger built into the rock. No aquifers, no dry-well risk: the conventional well on the left of the plate, the engineered loop on the right.



The conceptual bridge: a conventional well drawing on a natural hydrothermal resource against an Advanced Geothermal System extracting heat directly from hot rock formations, without requiring natural geothermal fluids or aquifers. The commercially proven low-temperature platform, deployed at the Hayat Kimya and AFJET sites in Türkiye, is the surface power block of both. Source: RePG / The Rob Rockefeller S.C.

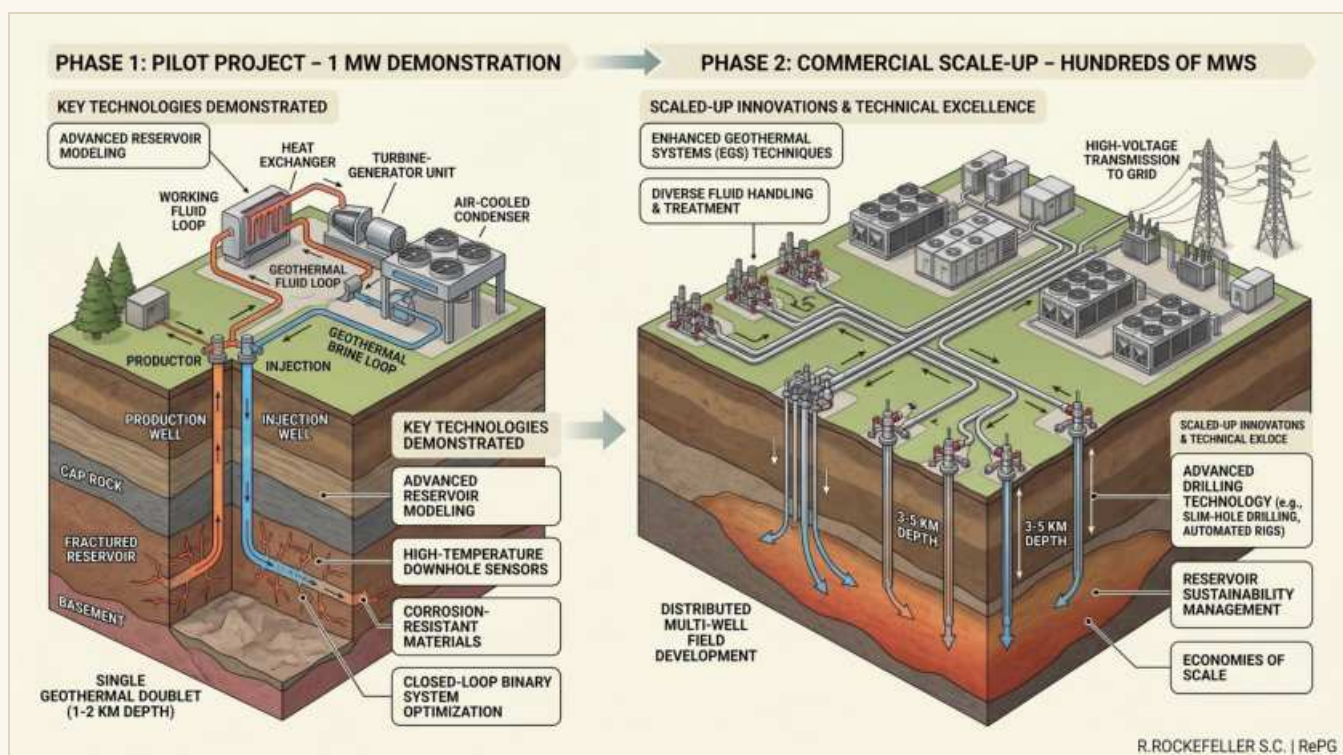
Advanced Geothermal Systems replace the natural reservoir of traditional geothermal with a heat exchanger engineered into the subsurface. Two architectures coexist, both compatible with the RePG turbine. In the **closed loop** a fluid circulates in a sealed ring drilled into hot dry rock: heat transfers by conduction, the ring never touches the surrounding geology, and water is neither consumed nor required.

In the **open loop**, water is injected into fractured formations and lifted from a separate production well as hot brine: the preferred solution in regions without natural aquifers such as central-eastern Anatolia, the US Mountain West and much of North Africa. The geological risk that defined geothermal economics for half a century, drilling for a reservoir that may not exist, is eliminated by design. The property that makes AGS a global asset class remains the temperature differential: the RePG window reaches depths below one kilometre practically everywhere.

THE ENGINEERING PATH · PLATE 7

What the pilot proves, what the scale-up adds

Phase 1 is a single geothermal doublet feeding one closed-loop binary block; Phase 2 is the same block replicated across a distributed multi-well field with high-voltage export.



Phase 1, the 1 MW demonstration: a single doublet with advanced reservoir modeling, high-temperature downhole sensors, corrosion-resistant materials and closed-loop binary system optimisation. Phase 2, commercial scale-up towards hundreds of MW: EGS techniques, diverse fluid handling and treatment, advanced drilling technology such as slim-hole drilling and automated rigs, distributed multi-well field development, reservoir sustainability management and transmission to grid. Source: RePG / The Rob Rockefeller S.C.

Phase 1 is about closing questions, not producing megawatts. The pilot doublet exists to demonstrate the components that carry subsurface risk: the reservoir model against real thermal drawdown, the sensors that read it downhole at temperature, the materials that survive the fluid, and the binary power block optimised as a closed loop. One megawatt is the smallest configuration in which all of them are tested together, in a real environment, on real rock.

Phase 2 is replication under discipline. Well spacing, fluid handling and reservoir stewardship become the governing variables; drilling shifts to slim-hole and automated methods; the surface becomes a field of identical modules feeding a common export point. The depth envelope shown in the plate spans the general AGS case: the 55°C threshold lets RePG occupy its shallow end, around 750 metres, while the same architecture reaches deeper and hotter configurations where a project demands them. Economies of scale arrive without a change of machine: the elementary unit of Phase 2 is the container already proven in Phase 1.

TECHNOLOGY MATURITY

Two speeds in the same hardware: TRL 9 industrial, TRL 7 AGS

The TRL scale, from 1 to 9, is the language institutions use to measure technical risk. The platform holds two positions, and the distinction is a strength.

Level 7 denotes a system prototype demonstrated in an operational environment; 8 a complete, qualified system; 9 an actual system proven in commercial service with verifiable data. **The industrial applications of Part Two are already at TRL 9**, the highest level, and generate revenue today: Hayat Kimya for over fifteen months, AFJET with public telemetry.

The integrated AGS vector is at TRL 7: the same turbine already converts, at AFJET, a 72-75°C geothermal fluid written off as thermally exhausted by every other ORC supplier. The 1 MW technical pilot at the Bursa Centre, under construction, takes it to TRL 9 within months. The first field pilot projects are already being programmed, in Bulgaria with the Ministry of Energy in Sofia and in Italy at Milazzo under a regional and European programme; initiatives with government counterparties are also under way in Tunisia, Egypt and Nigeria.

The only new element to validate is the sealed subsurface loop in hot rock, not the surface technology already proven: in geothermal the risk has historically been the subsurface, and here the subsurface is shallow drilling with mature water-industry methods. The residual risk is integration, not invention.

Protection and validation. According to company documentation, the technology is protected by two active US patents held by RePG Enerji Sistemleri (inventor Hasan Ayartürk), covering the generator and the pump; an academic study conducted at Rice University, supported by the US DOE and NREL, validates the low-temperature ORC architecture precisely in the 55-70°C band. EMC and type-test reports from accredited laboratories are on file and available under NDA.

KEY MILESTONES OF THE AGS PROGRAMME

YEAR	MILESTONE	STATUS
2024	AGS R&D programme launched at the Bursa centre	Completed
2025	Component validation and system integration: TRL 7 reached	Completed
2026	1 MW technical AGS pilot under construction at Bursa, demonstration towards TRL 9	In progress
2026-27	First national pilot projects: Bulgaria (Ministry of Energy, Sofia) and Italy (Milazzo, regional and European programme)	In programming
2026-27	Initiatives with government counterparties: Tunisia, Egypt, Nigeria	Under way
2027	First commercial AGS installation, bridge towards 10+ MW	Planned
2029	Commercial scale: first installations in MENA, Africa, California	Planned

Every additional industrial plant, by generating SCADA data, hardens the power-block engineering for AGS.

FROM PILOT TO SCALE · PLATE 8

The strategic leap: from the 1 MW pilot to utility scale

Five stages, one architecture: growth is the replication of proven modules on shallow wells, not redesign.



From the 1 MW pilot to utility operation beyond 500 MW: reservoir testing, appraisal and delineation, early development, full field development, utility-scale operation. Enablers across all stages: advanced drilling and completion, data and reservoir intelligence, operational excellence, ESG and community partnerships, permitting and regulatory alignment, disciplined capital deployment. Source: RePG / The Rob Rockefeller S.C.

1 MW, the pilot (2026). Verifies reservoir productivity, drilling and the power system in a real environment at Bursa: the step that closes TRL 8 qualification and opens TRL 9 for the AGS configuration.

5-20 MW, appraisal (from 2027). Additional wells, resource model and economic update: the first commercial project is born as a cluster of modules identical to those already in industrial service.

20-100 MW and beyond. Well-field expansion, spacing optimisation, power export integration: at every stage the elementary unit remains the containerised factory module, at roughly USD 2.8-3.5 million per MWe and 3-4 months from site works to power.

THE PILOT CAMPUS · PLATE 9

2026, the year the pilot turns on

The 1 MW AGS pilot project and its engineering center, side by side: validation hardware and the team that reads it, on one site, with operational commencement set for 2026.



Advanced Geothermal Systems, a strategic pathway for sustainable energy: the 1 MW AGS pilot project validating the technology in a real-world environment, and the adjoining engineering center for design, innovation and operational optimisation. Four pillars: sustainable, secure, scalable, collaborative. Operational commencement 2026. Source: RePG / The Rob Rockefeller S.C.

The pilot exists to be measured. Its mandate is the one set out on the preceding plates: validate AGS technology in a real environment, demonstrate performance, reliability and scalability, and pave the way for commercial-scale deployment. Every subsystem it runs is the subsystem the commercial fleet will run; every hour it logs is transferable evidence, in the same one-minute telemetry standard already public at AFJET.

The engineering center is the other half of the asset. Design, research and operational optimisation sit next to the hardware they serve, closing the loop between what the sensors report and what the next unit ships with. It is also where the next generation of the platform is prepared: the four pillars of the programme, sustainable baseload with minimal footprint, domestic energy security, modular scalability and partnership-driven development, are engineering requirements here, not slogans.

WHY NOW · UNITED STATES

Regulatory, hyperscaler and federal policy convergence

Three independent forces converged in 2024 and 2025, creating an unusual window of favourability for low-temperature geothermal.

The 30% Investment Tax Credit for geothermal generation was preserved through 2033, phasing down to 2036, by the One Big Beautiful Bill Act (P.L. 119-21, July 2025), while the analogous incentives for solar and wind were terminated early: Congress explicitly protected clean baseload technologies, the exact category this platform occupies.

The Department of Energy's Loan Programs Office has flagged geothermal as a preferred technology category eligible for accelerated review; the Department of Defense, through Directive 4180.01, formalised a baseload strategy for mission assurance that explicitly favours geothermal; Interior has introduced expedited procedures and categorical exclusions for exploration.

In parallel, the five US hyperscalers (Google, Meta, Microsoft, Amazon and Oracle) have collectively committed over 7 GW of new geothermal capacity since 2023: an order-of-magnitude expansion over the entire previous decade. The market is moving, the window is open, and RePG is the only technology commercially proven in the 55-70°C band.

CONVERGING REGULATORY AND COMMERCIAL TIMELINE, 2024-2034

DRIVER	PERIOD	STRATEGIC SIGNIFICANCE
30% ITC, geothermal generation	2024 to 2033/2036	Preserved by OBBBA 2025; solar and wind credits terminated early
PTP treatment for geothermal revenue	from 2026	Access to listed capital structures historically reserved for oil and gas
DOE Loan Programs Office	2024 onward	Geothermal classed as a preferred technology
Enhanced Geothermal Shot (DOE)	to 2035	Federal target: next-generation geothermal costs at USD 45/MWh
DoD Directive 4180.01	2024 onward	Baseload for mission assurance; geothermal preferred
Hyperscaler commitments	2023 to 2030	Over 7 GW cumulative (Google, Meta, Microsoft, Amazon, Oracle)

Sources: P.L. 119-21 and implementing guidance; US DOE; disclosed corporate communications; RRSC analysis, July 2026.

WHY NOW · EUROPEAN UNION

Europe gives geothermal a dedicated action plan

In June 2026 the Commission presented the first European Geothermal Action Plan: the technology formally enters the Union’s industrial priorities.

The political path has been explicit: the European Parliament Resolution of 18 January 2024 and the Energy Council Conclusions of 16 December 2024 formally asked the Commission for a geothermal strategy; the Action Plan, presented in June 2026 alongside the electrification and heating instruments, defines permitting pathways, financing and de-risking tools and a Geothermal Industrial Alliance.

The Net-Zero Industry Act (Reg. EU 2024/1735) already lists geothermal technologies among the strategic net-zero technologies, with binding permitting deadlines and strategic-project status; RED III presumes the overriding public interest of renewables and accelerates well permitting.

On the demand side, the recast Energy Efficiency Directive imposes energy audits and waste-heat recovery assessments on data centres as well, while ETS, ETS2 and CBAM put a rising price on every avoided fossil MWh: the natural weld between Part One and Part Two of this report.

THE EUROPEAN FRAMEWORK AT A GLANCE

INSTRUMENT	WHAT IT ESTABLISHES	RELEVANCE TO THE PLATFORM
EU Geothermal Action Plan (June 2026)	First dedicated EU framework: permitting, finance, de-risking, Industrial Alliance	Direct policy vehicle for low-temperature and next-generation geothermal
Net-Zero Industry Act (Reg. 2024/1735)	Geothermal among strategic net-zero technologies; binding permitting deadlines	Fast lanes and strategic status for AGS projects across all Member States
RED III (Dir. 2023/2413)	Overriding public interest; binding targets on heat and industry	Simplified permitting and structural demand for renewable process energy
Recast EED (Dir. 2023/1791)	Mandatory audits; waste-heat assessment and recovery, data centres included	Regulatory pipeline of the very heat streams converted in Part Two
ETS, ETS2 and CBAM	Carbon price on industry and imports	Every recovered MWh cuts CO2 cost exposure
EU funds: Innovation Fund, Modernisation Fund, RRF, JTF, EIB	Grants, soft loans, guarantees and premia for decarbonisation	Co-financing channels already mapped in RRSC country dossiers (Italy, Bulgaria, Malta, Türkiye)

Sources: EU Official Journal; Council doc. 16939/24; Commission communications as of July 2026; RRSC analysis.

THE EUROPEAN ANCHOR • PLATE 10

Milazzo: where the Italian pilot meets the European framework

The Augusto Innovation Hub in Milazzo, Sicily: a strategic European campus for artificial intelligence powered by the energy of the earth, with a RePG AGS unit written into the masterplan.



The Augusto Innovation Hub masterplan, Milazzo, Sicily: AI and cyber center, virtual production, research, innovation and university area, heritage core, reception and digital cultural area, and a RePG AGS 250 kW installation supplying clean, continuous geothermal energy to the campus. Source: The Rob Rockefeller S.C.

The hub gives the Italian pilot a home and a purpose. The Milazzo programme, referenced throughout Part One as the Italian field pilot in programming under a regional and European framework, materialises here as campus infrastructure: a 250 kW RePG AGS installation designed into the masterplan as the site's clean, continuous, zero-impact energy source, next to the AI and cyber facilities it is meant to power.

It is also the platform's European argument in miniature.

A sovereign-technology campus with quantum-safe security and European data sovereignty, drawing baseload from the ground beneath it, is precisely the pairing the EU framework of the preceding page rewards: NZIA strategic status for the geothermal asset, EED compliance for the digital one, and a Geothermal Action Plan that now gives such projects a dedicated policy vehicle. The plate is a masterplan today; its energy block is the same factory container this report has already shown in commercial service.

Industrial Waste Heat Recovery (WHR)



Power generation from industrial exhaust (95°C - 350°C).



Integration with cooling systems, hot oil, and flash steam.



High-efficiency RePG thermodynamic cycle.



Zero emissions and sustainable industrial operation.



GLOBAL VISION



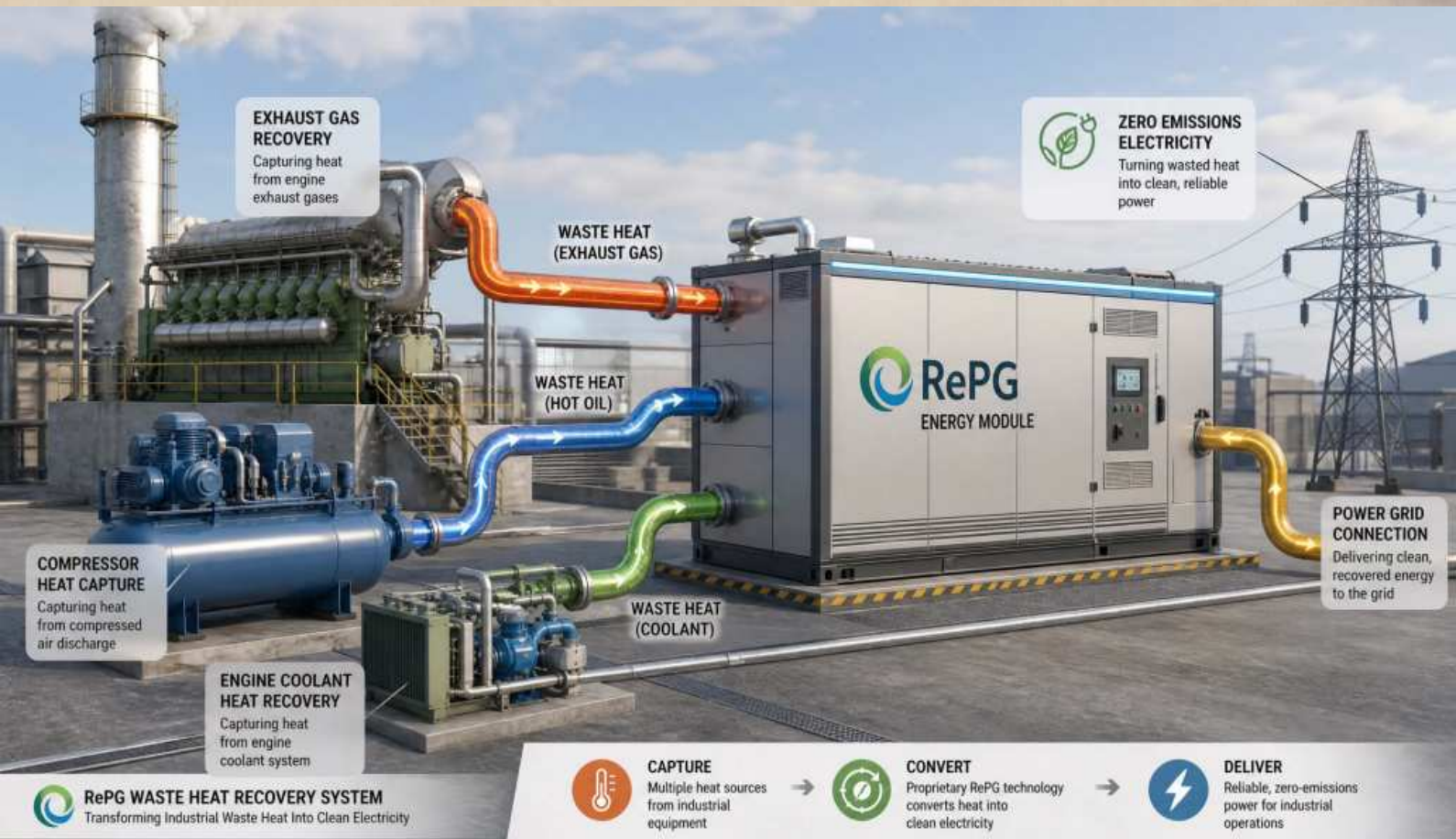
TECHNICAL EXCELLENCE



SUSTAINABLE SOLUTIONS



STRONG PARTNERSHIP



EXHAUST GAS RECOVERY

Capturing heat from engine exhaust gases

WASTE HEAT (EXHAUST GAS)

WASTE HEAT (HOT OIL)

WASTE HEAT (COOLANT)

COMPRESSOR HEAT CAPTURE

Capturing heat from compressed air discharge

ENGINE COOLANT HEAT RECOVERY

Capturing heat from engine coolant system



ZERO EMISSIONS ELECTRICITY

Turning wasted heat into clean, reliable power

POWER GRID CONNECTION
Delivering clean, recovered energy to the grid



RePG WASTE HEAT RECOVERY SYSTEM
Transforming Industrial Waste Heat Into Clean Electricity



CAPTURE
Multiple heat sources from industrial equipment



CONVERT
Proprietary RePG technology converts heat into clean electricity



DELIVER
Reliable, zero-emissions power for industrial operations

PART TWO

Industrial applications: the direct recovery of waste heat streams

Here the heat is not sought: it already exists. Flue gases, hot process water, cooling circuits the plant pays for twice, once to generate and once to reject. The same turbine as Part One, connected not to a well but to the waste streams, in commercial TRL 9 service today.

IN THIS PART

- 01 The principle: energy already paid for and the USD 4.6 billion market
- 02 The sharp distinction between the AGS vector and industrial recovery
- 03 Plant integration and field evidence: Hayat Kimya, AFJET and the sites in pictures
- 04 Data centres: the decisive use case, six options against six criteria
- 05 Application portfolio and financial framework
- 06 Worked application examples, computed line by line

THE INDUSTRIAL PRINCIPLE

Energy already paid for: the waste-heat market

Over 70% of the energy fed into industrial processes is ultimately lost as heat: the single largest source of unrecovered energy in the global economy.

A plant pays for this energy twice: first when it buys the fuel or electricity that generates it, then when cooling towers and chillers burn power and water to reject it. Every continuous stream above 55°C is therefore not a disposal problem: it is an idle generator, and the cheapest well in the world is the one already drilled, the process itself.

Sector assessments place recoverable industrial waste heat in the European Union alone at around 300 TWh a year, largely below 200°C; the company maps the addressable market for low-temperature ORC recovery as growing from about USD 4.6 billion in 2025 to about USD 12.9 billion in 2035, with data-centre cooling as the most dynamic segment.

Within this market RePG occupies a niche that is essentially uncontested today: the band below 80°C, where traditional ORC suppliers cannot operate economically and advanced-geothermal developers are absent. It is a first-mover advantage defended by a multi-year commercial track record.

ADDRESSABLE MARKET BY SECTOR, 2025 VERSUS 2035 ESTIMATE (USD BN)

SECTOR	2025	2035 (EST.)	SECTOR	2025	2035 (EST.)
Steel	1.1	3.2	Food processing	0.5	1.2
Cement	0.8	2.4	Paper	0.4	1.0
Chemicals	0.7	1.9	Textiles	0.3	0.9
Petrochemicals	0.6	1.5	Data centres 55-70°C	0.2	0.8

Aggregate: from USD 4.6 to 12.9 billion, a compound annual growth rate above 10%. Source: RePG market mapping; RRSC analysis.

THE DISTINCTION

Two vectors, the same machine: what actually changes

Technically, almost nothing: evaporator, expander, generator, condenser and controls are identical. What changes is the intake: a well in Part One, the plant’s waste stream here.

AGS AND INDUSTRIAL RECOVERY COMPARED

DIMENSION	PART I · AGS VECTOR	PART II · INDUSTRIAL RECOVERY
Heat source	The subsurface: sealed loop or shallow doublet, 55-120°C	The plant’s own streams: flue gas, hot water, condensate, 45-110°C
Civil works	Shallow wells, target circa 750 m	None: only a heat-exchanger tie-in
Time to power	3-4 months	8-14 weeks from order to service
Resource risk	Zero by design (sealed loop) or low (measured)	Zero: the stream is already metered by the site
Technology maturity	TRL 7; 1 MW pilot as the qualification step	TRL 9; in commercial service
Revenue model	Power producer: PPA, dedicated supply	Behind-the-meter self-consumption at the plant
Strategic role	The scale: geothermal as global infrastructure	Today’s proof and cash; every unit hardens the AGS block

This is why the industrial vector is already at TRL 9 while AGS completes its pilot: the industrial application removed the subsurface variable entirely and let the power block accumulate hours of commercial service. The vector’s engineering discipline is non-interference: the exchanger sits on the waste stream, the container stays outside the process perimeter, the electrical connection is grid-parallel behind the meter.

An automatic bypass guarantees that if the ORC stops for any reason, production never registers the event: the stream simply resumes its previous path. No process requalification, no production risk, no operating burden: the unit is monitored remotely with the same one-minute SCADA telemetry used across the platform.

PLANT INTEGRATION

Weeks, not years: the path from order to service

A factory product connected to existing streams: site works reduce to hydraulic and electrical tie-ins and commissioning.

The customer value has four layers, and only the first requires an assumption: **self-consumed electricity** at near-zero marginal cost, displacing grid purchases at industrial tariffs; **avoided cooling**, because the stream is returned already cooled; **carbon value**, with every recovered MWh cutting exposure to ETS, ETS2 and, for exporters to Europe, CBAM; and **compliance value**, because the Energy Efficiency Directive and ISO 50001 require exactly these streams to be identified and exploited.

For a continuous-process plant, above 8,000 hours a year, the arithmetic is the Hayat Kimya case restated at local tariffs: at Western European industrial rates, EUR 0.15-0.25 per kWh, the same energy is worth proportionally more and the payback compresses accordingly.

FROM ORDER TO COMMISSIONING: 8-14 WEEKS

PHASE	DURATION	ACTIVITIES	MILESTONE
1 · Procurement	4-6 weeks	Manufacturing, quality control, factory acceptance test	Unit ready to ship
2 · Logistics	2-4 weeks	Transport, customs, delivery to site	Unit on site
3 · Installation	1-2 weeks	Electrical and hydraulic tie-ins to the exchanger	Mechanical completion
4 · Commissioning	1-2 weeks	System tests, SCADA integration	Commercial operation (COD)

WHAT THE PLANT SEES

ELEMENT	IMPACT ON THE PROCESS
Plate heat exchanger on the waste stream	Minimal pressure drop; no process modification
ORC container outside the production perimeter	Footprint under 500 m² even at 1 MWe scale
Grid-parallel connection, behind the meter	Immediate self-consumption; no sales licensing
Automatic fail-safe bypass	Production never depends on the ORC
One-minute cloud telemetry	Remote monitoring; no on-site staffing

FIELD EVIDENCE · SITE A

Hayat Kimya: fifteen unbroken months on process heat

The largest RePG unit in continuous operation worldwide, inside one of the world’s major producers of hygiene and home-care products.

The Hayat Kimya plant runs dryers and thermal lines that generate waste heat at 70-110°C, previously vented to the atmosphere. Since December 2024 a 75 kWe unit has been converting that stream into 1,100-1,250 kWh a day, at a stable net output of 50.5 kW, around the clock.

A formal benchmark on 6 May 2024 documented performance across seven configurations, with hot inlet from 70 to 100°C. The customer publicly confirmed the installation on LinkedIn in August 2024; credentialed SCADA access is available to reviewers on request. At the site tariff, about EUR 0.10 per kWh, the observed payback is 2-3 years, before counting avoided cooling and carbon value.

INSTALLATION RECORD: HAYAT KIMYA, ISTANBUL

PARAMETER	VALUE
Application	Industrial waste-heat recovery (flue gas and process)
Heat source	70-110°C; field average 70-85°C
Installed capacity	75 kWe · water-cooled unit with evaporative tower
Instantaneous net output	50.5 kW (67.6 kW gross; 17.1 kW parasitic loads)
Daily production	1,100-1,250 kWh, stable band over 15+ months
Operation	Continuous and unbroken since December 2024
Monitoring	Splunk Cloud SCADA, one-minute telemetry
Public reference	Customer confirmation on LinkedIn, August 2024
Observed payback	2-3 years at the site tariff (~EUR 0.10/kWh)

Source: RePG SCADA telemetry; controlled benchmark of 6 May 2024; public customer communications.

FIELD EVIDENCE · SITE B

AFJET: the measured proof that 55°C is not a slogan

The unit intercepts geothermal reinjection water written off as thermally exhausted by every other ORC supplier and turns it into grid-quality electricity.

AFJET operates one of Türkiye’s largest geothermal district-heating systems at Afyonkarahisar. After primary heat extraction, the water is reinjected at 45-75°C: the 15 kWe RePG unit, air-cooled and with zero water consumption, produces from that stream about 281 kWh a day, 11.7 kW net on average, with over 70 continuous days and zero alarms. The telemetry is public, with no login, at repgenergy.splunkcloud.com: a standard of transparency uncommon in the segment.

The table opposite reports the measured sensitivity to hot inlet, with air at 0°C: at 55°C the machine stays in the black with 5.1 kW net, and still produces at 50 and 45°C. It is the operating point that turns the 55°C threshold from a marketing claim into an acceptance-test datum, and it is the most direct operating analogue of the future 1 MW AGS pilot, which scales the same turbine architecture.

MEASURED NET OUTPUT VERSUS HOT INLET (AIR AT 0°C)

HOT INLET	NET OUTPUT	HOT INLET	NET OUTPUT
85°C	14.8 kW	65°C	8.6 kW
80°C	13.2 kW	60°C	6.9 kW
75°C	11.7 kW	55°C	5.1 kW
70°C	10.2 kW	50°C · 45°C	3.2 kW · 1.2 kW

INSTALLATION RECORD: AFJET, AFYONKARAHISAR

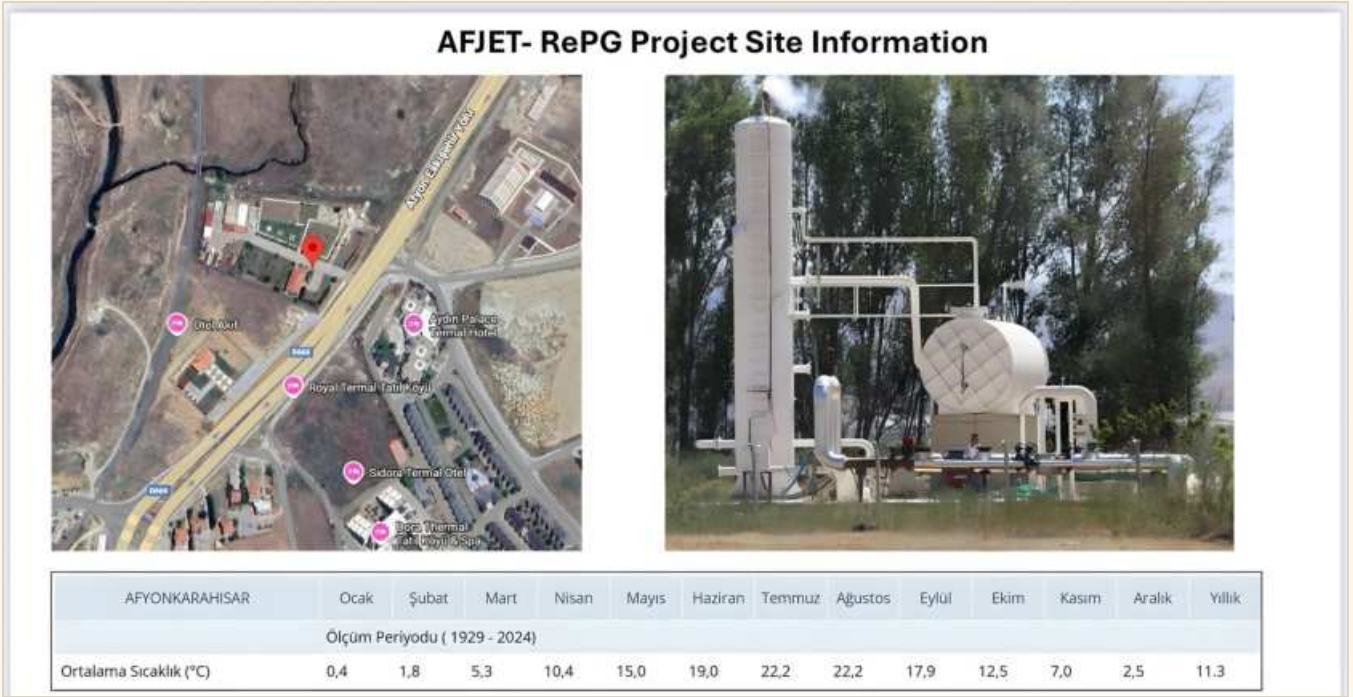
PARAMETER	VALUE
Application	Recovery from geothermal reinjection (district heating)
Heat source	Reinjection water, 45-75°C (72-75°C at inlet)
Installed capacity	15 kWe · air-cooled condenser, zero water use
Output	11.7 kW net average; 12.7 kW peak; ~101 MWh/year
Net efficiency	7.2% at 72-75°C: outstanding for this thermal class
Monitoring	Public SCADA dashboard, no login

Source: controlled acceptance-test data and RePG SCADA telemetry, AFJET site.

FIELD EVIDENCE · PLATE 11

AFJET: the site behind the measured curve

Where the 55°C proof physically stands: the Afyonkarahisar thermal district, the plant among the spa hotels it serves, and a century of climate data that explains the cold end of the machine.



The AFJET-RePG project site on the Afyon-Eskişehir road, in the heart of the Afyonkarahisar thermal district, surrounded by the spa hotels served by the geothermal network; on the right, the site's geothermal surface installations. Below, Afyonkarahisar monthly mean temperatures over the 1929-2024 measurement period. Source: RePG Energy site documentation.

The geography is the business case. The unit sits inside a mature district-heating system, downstream of hotels and homes that have already taken the premium heat: what reaches it is the reinjection line, the stream the rest of the industry treats as spent. That is precisely why the site is the reference: nothing about it is a laboratory.

The climate record is the cold end of the cycle. An air-cooled condenser tracks ambient temperature, and Afyonkarahisar's normals over 1929-2024 run from 0.4°C in January to 22.2°C in July and August, with an annual mean of 11.3°C. The acceptance curve of the preceding page, quoted at air 0°C, is therefore the site's real winter operating point, not a favourable assumption; summer afternoons derate the cold end modestly, and the annual mean keeps the condenser comfortably below the source for the entire year. The 281 kWh daily figure is the average of that seasonality, measured, not modelled.

FIELD EVIDENCE · PLATE 12

The official references, photographed on site

Not renders: containerised units in field deployment, a modular array on an industrial site, and the engineering team that builds them.



Original photographs, RePG geothermal technology in operation: a containerised unit in field deployment, a modular array installed on an industrial site with its air-cooled condensing on the roofline, and the engineering team at the Bursa workshop, Türkiye. Source: R. Rockefeller S.C. Engineering Center, Bursa.

The photographs carry the argument of Part Two in three frames. The single container is the product as it ships: closed, branded, connected by flanges and a cable. The array is the scaling thesis made visible: identical units side by side on one manifold, the serial-and-parallel topology of Plate 4 as built steel rather than diagram. And the team is the reason the counter keeps running: the machines are serviced by the people who designed them.

What the frames do not show matters as much: no cooling ponds, no fuel logistics, no stack. The footprint is the container plus routing, the emissions are zero, and the host site's process continues around the installation exactly as it did before the unit arrived.

THE FACTORY · PLATE 13

The Bursa Engineering Center: where the machine is made

Original photographs: real technology, real engineers, real results. Every component is designed, manufactured, assembled and tested on this floor before it ships.



The Bursa Engineering Center, Türkiye, in six frames: a RePG ORC geothermal unit on the floor, the proprietary heat exchanger and piping system, the ORC turbine module of a commercial unit, the manufacturing and testing floor, and the US patents on display beside the live control interface. Source: The Rob Rockefeller S.C. / RePG Energy.

Vertical integration is the quality system. Exchangers, piping, expander modules and control cabinets come together in one hall, and the factory acceptance test of every unit runs on the same floor where it was built. That is what makes the 8-14 week order-to-service figure credible: nothing waits on a third-party integrator, and nothing ships that has not already run.

It is also where the intellectual property lives. The patents shown in the frames are the two active US patents covering the generator and the pump, displayed beside the machines that embody them; the laptop screen alongside is the same telemetry environment that publishes the AFJET dashboard. Design, protection and proof share one address.

THE FACTORY · PLATE 14

Assembly and controls: the proprietary SCADA up close

Integration of a RePG ORC unit, the electronic control panel with the proprietary SCADA system, and the leadership on the floor where the work happens.



Original photographs, R. Rockefeller S.C. Engineering Center, Bursa: assembly and integration of a RePG ORC unit, the electronic control panel carrying the proprietary SCADA system, and a leadership visit to the engineering floor. Source: The Rob Rockefeller S.C. / RePG Energy.

The control cabinet is the product's nervous system.

Behind the panel door sit the PLC, the drives and the protections that run pinch tracking, load-following and the automatic fail-safe bypass described throughout this report; the same cabinet streams every station of the cycle to the cloud at one-minute resolution. It is engineered in-house because the low-temperature regime is won or lost in control: at these enthalpy drops, the software share of performance is as real as the hardware share.

The visits documented here are part of the diligence offer.

The Bursa floor is open to qualified reviewers by arrangement, machines in assembly and panels powered: the standing invitation formalised in the access section that closes this report.

THE DECISIVE USE CASE

Data centres: the electricity demand redrawing the picture

The IEA sees data-centre consumption more than doubling, from about 485 TWh in 2025 to about 945 TWh in 2030. What is needed is firm, continuous, zero-emission power.

The platform meets the data centre twice, and the two meetings compound. **As a generator**, AGS supplies firm, zero-carbon baseload from the ground beneath or beside the campus, with the minimal footprint and modular scalability documented in Part One. **As a recovery engine**, the same machine runs on the facility’s own reject heat: server liquid-cooling loops discharge at 55-70°C, exactly the RePG window, and no competing technology addresses that band commercially today.

The value-capture table below applies the honest chain declared in Worked Example B, on page 37, to four facility scales: about 95% of server energy becomes heat, roughly 60% of it is capturable in the liquid loop, and ORC conversion at these temperatures is 5-7%, anchored by the measured AFJET datum. The recovered megawatt also returns the coolant already cooled, trimming chiller duty: a second saving the table does not even count.

VALUE CAPTURE FROM COOLING HEAT, BY SCALE

DATA-CENTRE SCALE	HEAT AT 55-70°C	ORC NET OUTPUT	ANNUAL REVENUE
Edge 5 MW	circa 2.9 MWth	circa 150-200 kWe / 2-3 units	circa USD 0.13-0.17 million
Mid-size 30 MW	circa 17 MWth	circa 0.9-1.2 MWe / 12-16 units	circa USD 0.76-1.0 million
Hyperscale 100 MW	circa 57 MWth	circa 3.0-4.0 MWe / 40-53 units	circa USD 2.5-3.4 million
Mega-campus 1 GW	circa 570 MWth	circa 30-40 MWe / 400-530 units	circa USD 25-34 million

Chain of assumptions, stated in full: about 95% of the energy drawn by servers becomes heat; roughly 60% of it is capturable in the 55-70°C liquid-cooling loop; ORC net conversion at these temperatures is 5-7%, consistent with the measured AFJET datum; capacity factor 80%; offtake USD 0.12/kWh. A deliberately conservative engineering basis: the platform additionally supplies primary AGS baseload to the same sites. Source: RRSC model on IEA, Energy and AI.



R.Rockefeller.S.C & RePG Geothermal

The Ultimate Solution for Data Centers

24/7 Power and Cooling for AI

- **Reliable Baseload:** Continuous, 24/7 power supply ensuring 100% uptime for critical servers.
- **Advanced Cooling:** Efficient heat dissipation and thermal management for massive server farms.
- **Sustainable Future:** Powering the AI revolution with clean, reliable, and exclusive AGS technology.

THE DECISIVE USE CASE · PLATE 15

Six options, six criteria: why RePG wins the comparison

Diesel, solar, wind, nuclear SMR, traditional geothermal and RePG, scored on what a data centre actually needs: no other technology checks every box.

The Rob Rockefeller S.C.

Why RePG Wins: The Data Center Energy Comparison

No Other Technology Delivers What Geothermal Can

	AVAILABILITY (24/7)	CARBON FOOTPRINT	COOLING CAPABILITY	LAND FOOTPRINT	SCALABILITY	COST PREDICTABILITY
DIESEL GENERATORS	Available 24/7 ✓	HIGH carbon X	NO cooling X	MEDIUM footprint	LIMITED scale X	VOLATILE fuel cost X
SOLAR PV	NOT 24/7 (night/clouds) X	ZERO carbon ✓	NO cooling X	LARGE land footprint X	GOOD scale ✓	MEDIUM predictability
WIND POWER	NOT 24/7 (calm days) X	ZERO carbon ✓	NO cooling X	VERY LARGE footprint X	GOOD scale ✓	MEDIUM predictability
NUCLEAR SMR	Available 24/7 ✓	LOW carbon ✓	NO direct cooling X	MEDIUM footprint	LIMITED scale X	HIGH upfront cost X
TRADITIONAL GEOTHERMAL	Available 24/7 ✓	ZERO carbon ✓	PARTIAL cooling	MEDIUM footprint	LIMITED (needs volcanic zone) X	EXCELLENT predictability ✓
REPG GEOTHERMAL (OUR TECHNOLOGY)	Available 24/7 ✓	ZERO carbon ✓	FULL DIRECT COOLING ✓	MINIMAL footprint ✓	UNLIMITED scale ✓	EXCELLENT cost predictability ✓ — THE ONLY SOLUTION THAT CHECKS ALL BOXES.

The data-centre energy comparison across six criteria: 24/7 availability, carbon footprint, cooling capability, land footprint, scalability and cost predictability. RePG geothermal is the only option combining round-the-clock availability, zero carbon, full direct cooling, minimal footprint, unlimited scale and excellent cost predictability. Source: RRSC analysis, 2026.

Read the matrix by elimination. Diesel is firm but carbon-heavy and fuel-exposed; solar and wind are clean but intermittent and land-hungry; nuclear SMR is firm and low-carbon but limited in scale today, with high upfront cost and no direct cooling role; traditional geothermal is excellent where volcanic geology allows it, which is precisely its limit.

The decisive column is cooling. Every other option treats the data centre's heat as someone else's problem; RePG is the only one that runs on it, natively, in the 55-70°C band the liquid loop actually delivers. Add fuel-free cost predictability over a 20-year life and the matrix closes: the only solution that checks all six boxes is the one already proven at TRL 9 in exactly this thermal window.

GLOBAL APPLICATIONS · PLATE 16

One power module, three deliveries: power, heat, cooling

The integrated view: a geothermal power module serving a data centre, an industrial plant and direct heat use from the same clean, continuous source.



Global applications, data centres and industry: integrated geothermal solutions delivering sustainable baseload energy, direct-use applications and low-emission, reliable, scalable supply. The section view shows one geothermal power module feeding a data centre with reliable power for critical infrastructure, an industrial plant with process heat and power, and direct heat use for heating, cooling and industrial processes. Source: RePG / The Rob Rockefeller S.C.

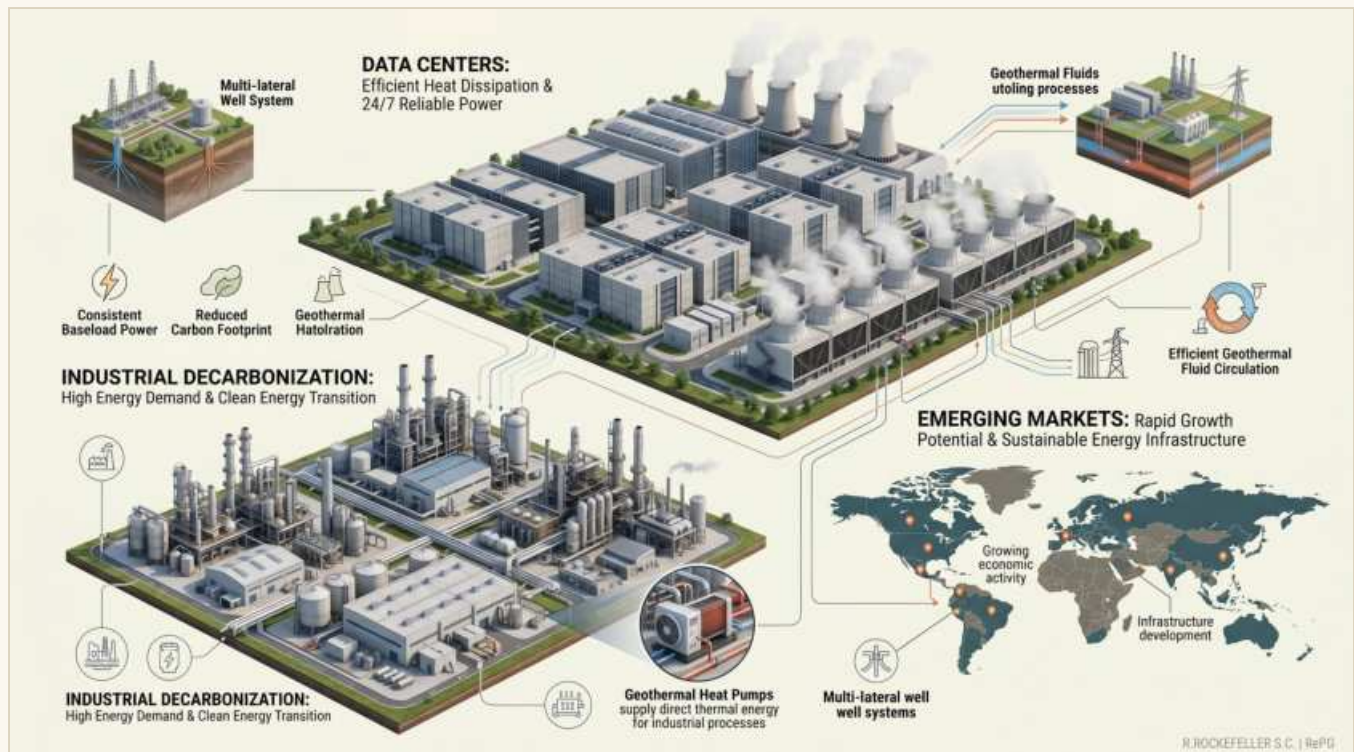
The plate's point is co-location. One subsurface source, one power block, three simultaneous customers: electricity behind the meter for the servers, process heat and power for the plant next door, and direct thermal delivery where the application wants heat rather than kilowatt-hours. The economics of each delivery reinforce the others, because the capital below ground is shared.

It is also the shape of the campus deals the platform targets: the Milazzo masterplan of Plate 10 is exactly this drawing rendered as a real site, and the data-centre arithmetic of the preceding pages is its first column made bankable. Integrated delivery is not a future feature: every element in the section view is hardware this report has already shown in service or in pilot.

GLOBAL APPLICATIONS · PLATE 17

The applications atlas: three demand fronts, one platform

Data centres, industrial decarbonisation and emerging markets: the three demand fronts of the decade, drawn onto one geothermal supply picture.



The applications atlas: data centres seeking efficient heat dissipation and 24/7 reliable power; industrial decarbonisation under high energy demand and clean-energy transition, with geothermal heat pumps supplying direct thermal energy to processes; and emerging markets pairing rapid growth potential with sustainable energy infrastructure. Multi-lateral well systems and efficient geothermal fluid circulation connect the three. Source: RePG / The Rob Rockefeller S.C.

Each front asks the platform a different question. Data centres ask for firmness and cooling synergy: answered on the preceding plates. Industry asks for decarbonised process energy without process risk: answered by the behind-the-meter, bypass-protected integration model of this Part. Emerging markets ask for infrastructure that arrives fast, scales modularly and does not depend on fuel logistics: answered by the container itself, 8-14 weeks from order, anywhere a truck and a shallow rig can reach.

The atlas also situates the adjacent technologies honestly: heat pumps and multi-lateral wells appear as integrations the platform connects to, not as generation substitutes; the map's markers, from the Americas to Africa and Asia, track the government-counterparty initiatives already listed in the AGS milestones of Part One.

THE APPLICATION PORTFOLIO

One machine, many streams: the portfolio in service

The ability to generate from sources of just 55°C turns almost every continuous heat stream above that threshold into a power asset.

The portfolio shares a single hardware platform and a single deployment model: factory-built containerised modules, connected to existing streams in 8-14 weeks. Only the source varies: industrial flue gas, geothermal reinjection, data-centre cooling loops, co-produced water, solar thermal, compressor oil, boilers, district-heating returns.

In the Permian Basin alone, co-produced water, around 22 million barrels a day at 60-90°C, is a continuous heat stream currently treated as a liability; retrofitting depleted wells turns a plugging-and-abandonment cost into a power asset by connecting the RePG unit to the existing wellhead.

APPLICATION PORTFOLIO, CURRENT STATUS

APPLICATION	HEAT SOURCE	TEMPERATURE	STATUS
Industrial waste heat	Flue gas, effluents, process	70-110°C	TRL 9 · Hayat Kimya, 15+ months
Geothermal reinjection	Reinjection at existing plants	45-75°C	TRL 9 · AFJET, public SCADA
Data-centre cooling	Server cooling loops	55-70°C	Commercially deployable
Co-produced oil & gas water	Hot water from wells	60-90°C	Commercially deployable
Depleted-well retrofit	Geothermal heat via wellbore	60-120°C	Commercially deployable
Solar thermal and CSP	Evacuated-tube collectors, CSP	85-120°C	Multiple sites in service
Compressor oil and boilers	Oil and hot-water circuits	80-95°C	Multiple sites in service
Direct-use geothermal	Thermal resorts, DH cascades	85-115°C	Multiple sites in service
Vehicle / engine	Engine coolant	85°C	Renault Master reference
Off-grid container	Solar hybrid plus storage	variable	Ready for deployment
Atmospheric water (AQUA)	Humidity and thermal cycle	ambient	In service (Ege Vitrifiye, 1,000 L/day)

This uniformity of deployment is the structural reason every new installation hardens the engineering of every subsequent one, including the AGS pilot of Part One.

FINANCIAL FRAMEWORK

The economics of a 1 MWe reference plant

Base case: CAPEX USD 3.15 million, offtake USD 0.11/kWh at the centre of the 0.10–0.12 grid-parity band, capacity factor 80%, 20-year life. A 20.7% IRR excluding incentives and an NPV of about USD 4–6 million at 8%.

BASE-CASE PARAMETERS, 1 MWE SCALE

PARAMETER	VALUE	BASIS
Total CAPEX	USD 2.8–3.5 million	Equipment, installation, commissioning
Annual OPEX	USD 80–120 thousand	Maintenance, monitoring, insurance
Annual production	circa 7,000 MWh	1 MWe × 8,760 h × 80% capacity factor
Revenue (self-consumption)	USD 700–850 thousand/year	Grid-parity band, USD 0.10–0.12/kWh
Simple payback	4–5 years	Self-consumption model; break-even ~4.7 years at USD 0.11
IRR (20-year life)	18–24% (base 20.7%)	Excluding tax incentives; base at USD 0.11/kWh
NPV (20 years, 8% discount)	circa USD 4–6 million	Present values at 8%; includes the 30% ITC; undiscounted cumulative cash ~+10.2 million
Land requirement	under 500 m ²	Containerised modular footprint

Sensitivity confirms the robustness of the case: excluding incentives, the 20-year IRR stays above the 12% institutional threshold as long as the energy price exceeds about USD 0.075/kWh; applying the 30% ITC to capital, the threshold falls to roughly USD 0.06. Both sit well below current industrial tariffs in the United States and Europe, and at the three CAPEX levels considered, 2.8, 3.15 and 3.5 million, the project clears the bar across the whole 0.08–0.15 USD/kWh range.

On the value bridge, every term in present value at 8%: twenty-year gross revenue at the USD 0.12 upper band (+8.3 million), availability allowance (–0.4), OPEX (–1.0), CAPEX (–3.15) and the 30% ITC preserved by the OBBBA (+0.95) converge to about +4.7 million; at the USD 0.11 base the same bridge yields about +4.0. Undiscounted, the plant returns roughly +10.2 million over its life. At single-container scale the field evidence applies: at Hayat Kimya the observed payback is 2–3 years at the site tariff.

WORKED EXAMPLE A

The 1 MWe waste-heat plant, computed line by line

The reference case of the preceding page rebuilt from first principles, so that every figure can be checked with a pocket calculator.

FORMULA CHAIN · CAPEX 3,150K · OPEX 100K/YR · CF 80% · 20-YEAR LIFE · 8% DISCOUNT

STEP	FORMULA, VALUES IN	RESULT AT 0.10 / 0.11 / 0.12 USD/KWH
1 · Annual energy	$E = P \times 8,760 \times CF = 1,000 \times 8,760 \times 0.80$	7,008 MWh in every case
2 · Revenue	$R = E \times p$	700.8 / 770.9 / 841.0 k USD
3 · Net cash	$F = R - OPEX = R - 100k$	600.8 / 670.9 / 741.0 k USD
4 · Simple payback	$C / F = 3,150 / F$	5.24 / 4.70 / 4.25 years
5 · IRR, 20 years	solve $AF(r, 20) = C / F$	circa 18.4 / 20.7 / 23.2 %
6 · NPV before allowances	$F \times AF(8\%, 20) - C = F \times 9.818 - 3,150$	2.75 / 3.44 / 4.13 M USD
7 · NPV, final	+ ITC 0.945 - availability 0.4	circa 3.3 / 4.0 / 4.7 M USD

AF is the 20-year annuity factor, $AF(r, 20) = (1 - (1+r)^{-20}) / r$; $AF(8\%, 20) = 9.818$. Step 7 reproduces the value bridge of the financial framework exactly.

Reading the result: at the 0.11 base the plant returns its capital in 4.70 years and compounds to roughly 10.2 million of undiscounted cash over life, an internal rate of about 20.7% with no incentive assumed. The ITC enters only the NPV line, conservatively, as a single year-one credit.

At single-container scale the same arithmetic applies pro rata, and the field adds what the formula omits: avoided cooling and carbon exposure. That stacked value is why the observed payback at Hayat Kimya, 2-3 years at the site tariff, runs faster than the electricity-only line above.

WORKED EXAMPLE B

A 30 MW data centre, every assumption declared

The honest thermodynamic chain behind the value-capture table on page 30, applied to a mid-size facility, step by step.

CHAIN OF ASSUMPTIONS · IT LOAD 30 MW · CF 80% · OFFTAKE USD 0.12/KWH

STEP	FORMULA	RESULT
1 · Heat rejected	$Q_h = 0.95 \times \text{IT load} = 0.95 \times 30$	28.5 MWth
2 · Capturable at 55-70°C	$Q_c = 0.60 \times Q_h$ (liquid-cooling loop share)	17.1 MWth
3 · ORC net output	$P = \eta \times Q_c$, with $\eta = 5\text{-}7\%$ at these temperatures	circa 0.9-1.2 MWe
4 · Unit count	$P / 75 \text{ kWe}$	12-16 units
5 · Annual energy	$E = P \times 8,760 \times 0.80$	6.3-8.4 GWh
6 · Annual revenue	$R = E \times 0.12$	circa USD 0.76-1.0 million

The conversion figure η is anchored by measurement, not assumption: AFJET delivers 7.2% net at 72-75°C and 5.1 kW net even at a 55°C inlet. This chain reproduces the value-capture table exactly.

Two honesty rules govern the chain. First, only the IT load counts, never the facility total: counting cooling overhead as recoverable heat double-books energy that modern low-PUE sites do not waste. Second, only the liquid-loop share is capturable at useful temperature; air-side rejection is too diffuse to harvest.

The recovered megawatt is not the whole value. The stream returns to the cooling plant already cooled, trimming chiller duty; the recast Energy Efficiency Directive requires data centres to assess and exploit exactly this heat; and the same platform supplies primary AGS baseload to the same site, which is where the large megawatts sit.

WORKED EXAMPLE C

Reinjection water and produced water, sized from first principles

Two streams the world treats as liabilities, sized with the same declared formula: $Q = m \times c_p \times dT$.

C1 · DISTRICT-HEATING UTILITY · REINJECTION LINE, 100 L/S COOLED FROM 70 TO 60°C

STEP	FORMULA	RESULT
1 · Heat duty	$Q = m \times c_p \times dT = 100 \times 4.186 \times 10$	circa 4,190 kWth
2 · ORC net output	$P = 0.06 \times Q$	circa 250 kWe · 3-4 air-cooled units
3 · Annual energy	$E = 250 \times 8,760 \times 0.80$	circa 1.75 GWh
4 · Annual revenue	$R = E \times 0.11$	circa USD 190 thousand

C2 · OIL & GAS · PRODUCED WATER, 10,000 BBL/DAY AT 80°C, COOLED BY 20 K

STEP	FORMULA	RESULT
1 · Mass flow	$10,000 \text{ bbl} \times 159 \text{ L} = 1,590 \text{ m}^3/\text{day}$	circa 18.4 kg/s
2 · Heat duty	$Q = 18.4 \times 4.186 \times 20$	circa 1,540 kWth
3 · ORC net output	$P = 0.06\text{-}0.07 \times Q$	circa 90-110 kWe · 1-2 units
4 · Annual energy	$E = P \times 8,760 \times 0.80$	circa 0.63-0.77 GWh

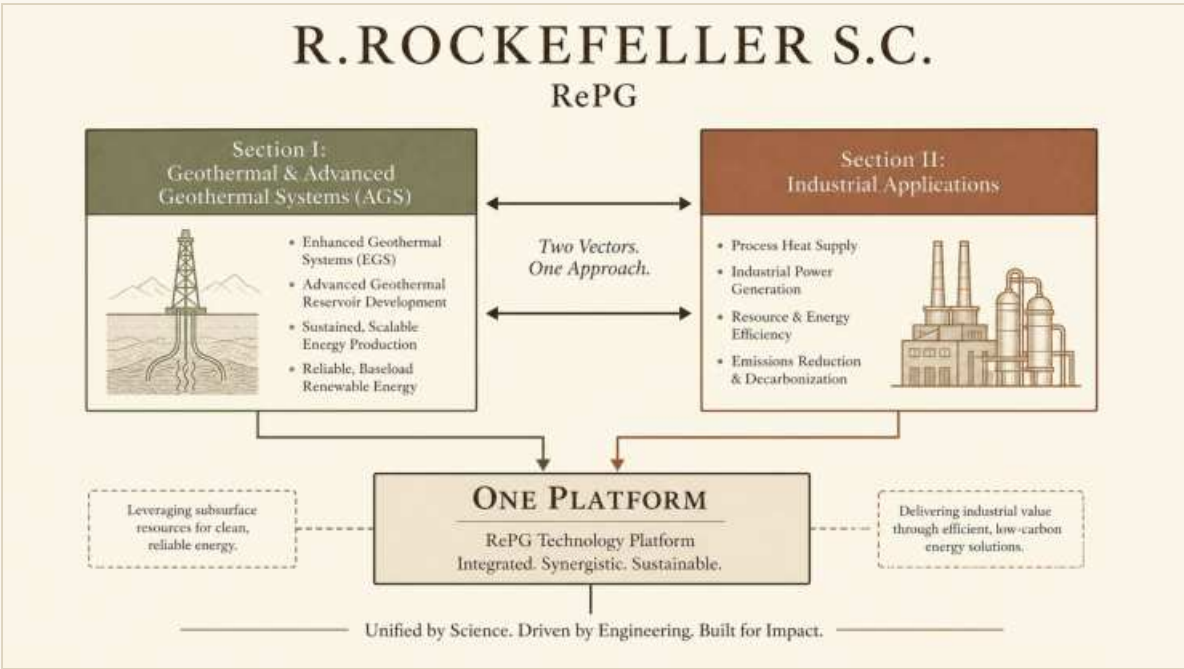
Both sizings are illustrative: on a real stream the governing variables are flow duration, the achievable pinch and the delivered dT, all of which the site's own meters already record. The conversion assumption is anchored by the measured AFJET curve at exactly these temperatures. In the Permian Basin, produced water runs to roughly 22 million barrels a day at 60-90°C: the C2 arithmetic, multiplied across a field, converts a disposal cost into pumping power at the wellhead.

The reinjection case is the closest operating analogue to shallow AGS itself: the same water chemistry, the same temperature band, the same air-cooled hardware, already running at AFJET with the telemetry in public view.

CLOSING · PLATE 18

Two vectors, one platform: risk matrix and conclusion

The industrial vector proves the machine and funds it; the AGS vector scales it into global infrastructure. Neither competes with the other: they compound.



Section I, geothermal and AGS; Section II, industrial applications: two vectors, one approach, one technology platform. Unified by science, driven by engineering, built for impact. Source: RePG / The Rob Rockefeller S.C.

RISK MATRIX FOR INSTITUTIONAL DUE DILIGENCE

RISK	MITIGATION
Technology	TRL 9 status and 15+ months of continuous commercial data at Hayat Kimya; public AFJET telemetry
Execution	Plug-and-play modular design, cutting on-site construction to weeks
Regulatory	Zero-emission profile, 30% ITC preserved in the US, EU Action Plan and NZIA in Europe
Resource	A 55°C requirement that multiplies usable sites; sealed loop with no dry-well risk

The RePG technology of The Rob Rockefeller S.C. is not simply another renewable source: it is a platform that unlocks a vast, clean and hitherto unused resource, the planet’s low-temperature heat. A single ORC architecture, already at TRL 9 in the thermal band the rest of the industry has overlooked, extended towards Advanced Geothermal Systems with the surface power block already commercial: the convergence of a preserved ITC, over 7 GW of hyperscaler demand and a dedicated European Action Plan places the platform in a structural position no competitor can replicate from scratch.

ANNEX · METHODS

Methodological note: symbols and formulas

Every quantitative claim in this report reduces to the formulas on this page and is verified, one by one, on the next.

SYMBOLS

SYMBOL	MEANING	SYMBOL	MEANING
P	Net electrical capacity (kW)	C	Total CAPEX (USD)
CF	Capacity factor (share of 8,760 h)	r, n	Discount rate; years of life
E	Annual energy (kWh)	AF	Annuity factor (present value of 1/yr)
p	Offtake price (USD/kWh)	T_h, T_c	Hot and cold temperatures (kelvin)
R, O, F	Revenue; OPEX; net cash R - O	m, c_p, dT	Mass flow (kg/s); 4.186 kJ/kg·K; cooling (K)

FORMULAS

QUANTITY	FORMULA
Annual energy	$E = P \times 8,760 \times CF$
Revenue and net cash	$R = E \times p \cdot F = R - O$
Simple payback	$Payback = C / F$
Annuity factor	$AF(r, n) = (1 - (1 + r)^{-n}) / r \cdot AF(8\%, 20) = 9.818 \cdot AF(12\%, 20) = 7.469$
Net present value	$NPV = F \times AF(r, n) - C (+ ITC \text{ where stated})$
Internal rate of return	IRR is the r that solves $AF(r, n) = C / F$
Carnot ceiling	$\eta_{C} = 1 - T_{c} / T_{h}$ (temperatures in kelvin)
Net cycle efficiency	$\eta = W_{net} / Q_{in}$
Heat duty of a stream	$Q = m \times c_{p} \times dT$
Data-centre chain	$P = IT \text{ load} \times 0.95 \times 0.60 \times \eta$, with $\eta = 5\text{--}7\%$

ANNEX · VERIFICATION

Every headline number, checked against its formula

The arithmetic audit of this edition. Differences beyond rounding do not exist; where a figure is a band, both ends are shown.

VERIFICATION TABLE

CLAIM IN THIS REPORT	CHECK	OUTCOME
7,008 MWh/year at 1 MWe	$1,000 \times 8,760 \times 0.80$	Exact
Revenue USD 700-850k	$7,008 \text{ MWh} \times 0.10\text{-}0.12$	700.8-841.0k: matches
Break-even ≈ 4.7 years	$3,150 / (770.9 - 100)$	4.696 years: matches
IRR 20.7% at base	$\text{solve } AF(r, 20) = 4.696$	$r \approx 20.7\text{-}20.8\%$: matches
12% IRR floor $\approx$ USD 0.075	$p = (3,150 / 7.469 + 100) / 7,008$	0.0745: matches
Floor with 30% ITC ≈ 0.06	$p = (2,205 / 7.469 + 100) / 7,008$	0.0563: matches
Carnot 12.2% at 55°C	$1 - 288 / 328$	0.122: exact
Hayat 1,100-1,250 kWh/day	$50.5 \text{ kW} \times 24 \text{ h} = 1,212$	Inside the measured band
AFJET ≈ 281 kWh/day	$11.7 \text{ kW} \times 24 \text{ h}$	280.8: matches
AFJET ≈ 101 MWh/year	280.8×365 , net of stops	$\approx 100\text{-}102$: matches
Data centre 0.9-1.2 MWe at 30 MW	$30 \times 0.95 \times 0.60 \times (0.05\text{-}0.07)$	0.86-1.20: matches
13-14 units per MWe	$1,000 / 75$	13.3: matches

Rounding convention: monetary figures to the nearest 10 thousand, energies to three significant digits, rates to one decimal. The full financial model with cell-level formulas and sensitivity cases is part of the official documentation released under NDA.

DUE-DILIGENCE ACCESS

Five points of access, one standard: verifiability

Live data, inspectable sites, full documentation under NDA: operational transparency is part of the product.

NO.	POINT OF ACCESS	AVAILABILITY
1	Live SCADA access: the AFJET dashboard is public at repenergy.splunkcloud.com with no authentication; Hayat Kimya with credentials	Immediate
2	Physical site access: both flagship Turkish installations are inspectable	Within 48 hours of request
3	Bursa Centre visit	By arrangement
4	Full engineering documentation, test reports and the AGS pilot financial model	Under standard NDA
5	Indicative term sheets, for the AGS pilot and for 1 MWe industrial reference installations	On qualified request

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