R. Rockefeller S.C.

TECHNICAL PARTNER

RePG

RePG GEOTHERMAL AGS

Geothermal AGS Green Energy Research Lab

Principal Global Engineering Center
Bursa, Türkiye



Company Presentation

Our main global engineering and research centre



Original photograph of the Bursa engineering centre

An international partnership. RePG provides the technology and industrial platform. RRSC connects that capability with international project development and applications.

4,000 m²
Total centre area

85
Engineers

1,500 m²
Indoor working area

2,500 m²
Outdoor working area

In Nilüfer, Bursa, R. Rockefeller S.C. and RePG Energy bring research, engineering and manufacturing into one working environment. The centre connects technology development with practical equipment assembly and testing.

From research to equipment

Mechanical and electrical teams develop prototypes, turbine systems, heat exchangers, piping and controls. The programme covers geothermal AGS, ORC conversion, industrial heat recovery, data centre energy systems, atmospheric water and humidity based generation.

Original photographs of the centre

Original views of assembly, electrical preparation, testing and portable research devices at the Bursa engineering centre. Together, they show the physical work behind the technology programme.



Working hall and assembly areas.



Dedicated testing rooms.



Equipment layout and loading access.



Mechanical assembly and fittings.



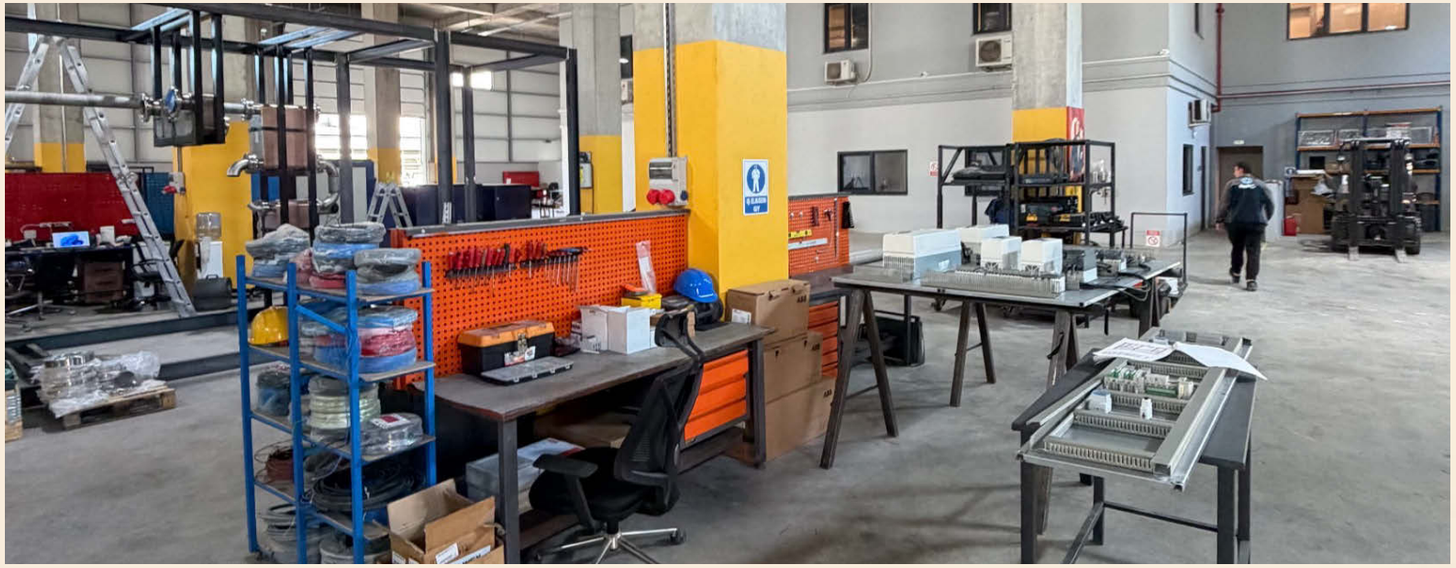
Equipment and service connections.



Portable research devices.











Centre leadership: names at right



With the engineering team in the workshop

The Global CEO and centre leadership

Global CEO Valentino Loforese met the leadership and engineering team, then inspected the work areas in detail. The visit covered specialised AGS turbine development and the latest generation of data centre energy systems being prepared for future applications.

Centre leadership · left to right

01 **Huseyin Karayagiz**
Engineering Centre General Manager and RePG CEO

02 **Engin AKEL**
President, Türkiye

03 **Valentino Loforese**
RRSC CEO

04 **Hasan AYARTURK**
Chief of Staff Engineer, Main Global Engineering Center; Founder and Majority Shareholder, RePG Energy

05 **Hakan İşeri**
Director of the Engineering and Manufacturing Facility

Original RRSC/RePG centre photographs; inspection details and roles provided by RRSC.

How the Bursa centre turns research into equipment

Our main global engineering and research centre in Bursa connects the people who develop technology with the teams who assemble, instrument and test the equipment. The shared environment supports a continuous engineering process, from an application requirement to a machine ready for defined factory and site acceptance.

One environment for several energy disciplines

The centre brings together 85 engineers across a 4,000 m² site, with 1,500 m² indoors and 2,500 m² outdoors. Its work covers geothermal AGS, turbine and ORC systems, industrial heat recovery, data centre energy integration and environmental technologies. These programmes share expertise in thermal transfer, mechanical design, electrical conversion, control and practical assembly.

Research connected with project delivery

RePG contributes its technology, manufacturing capability and engineering team. RRSC connects that industrial base with international applications and project development. The official Global CEO inspection brought management and engineers together around work in progress, including specialised turbines and energy systems for future data centre and European applications.

Engineering activity	Practical deliverable
Define the application	A duty specification covering source energy, useful output, operating conditions and customer interfaces.
Design and assemble	Coordinated mechanical, thermal and electrical equipment with access for operation and maintenance.
Instrument and test	Calibrated measurements, recorded operating conditions and agreed performance boundaries.
Prepare deployment	A documented package for site integration, commissioning, training and subsequent support.

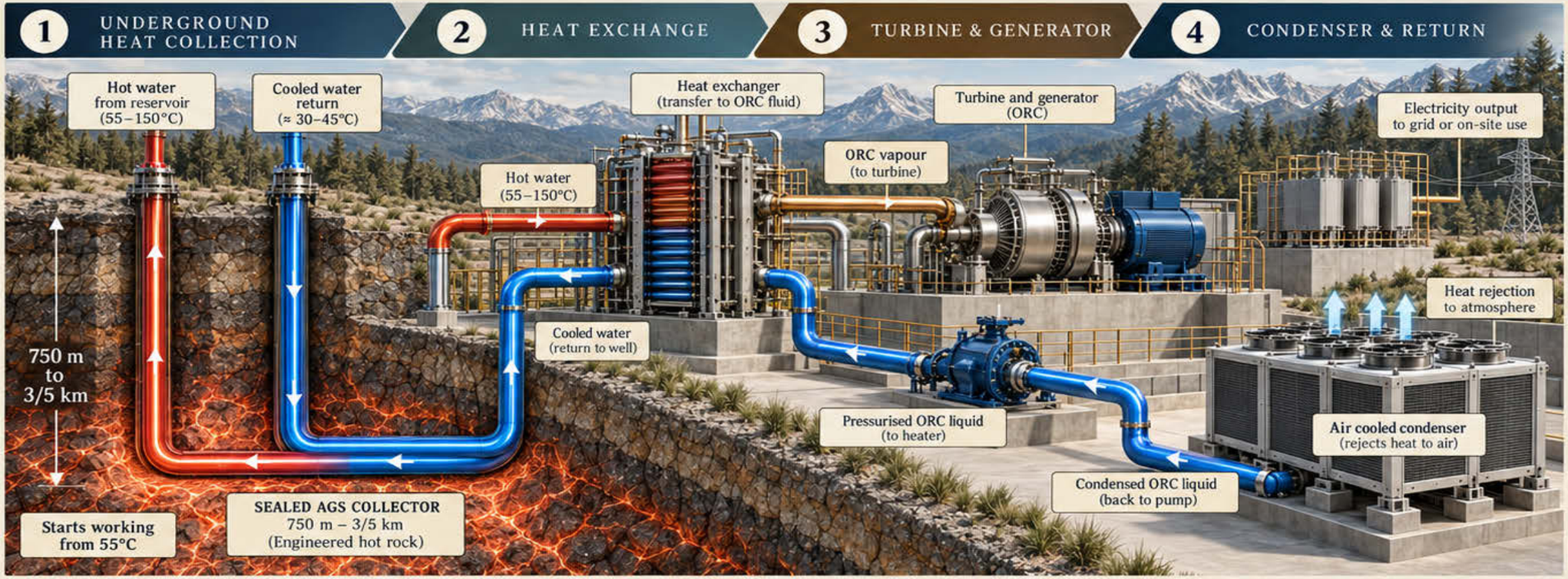
The value of the centre is the connection between research and physical execution. Every operating record can improve the next design, while each project gives the engineering teams a clearer understanding of the customer's actual energy requirements.

Sources: S01, S02, S03

Geothermal AGS: how it works

CLEAN
RELIABLE ENERGY
FROM EARTH'S
NATURAL HEAT

A sealed underground AGS collector carries water through hot rock to a surface exchanger. Heat enters a separate ORC fluid that drives the turbine and generator. The two fluids remain isolated. Collector water returns underground after releasing heat. The condenser rejects residual ORC heat; its pump returns liquid to the exchanger. Generation requires sustained ground heat and effective cooling.



01 Collect

Water receives heat inside the sealed underground collector and carries it to the surface.



02 Transfer

The heat exchanger transfers heat from the hot water to a separate ORC fluid. The cooled water returns to the ground.



03 Generate

ORC vapour expands through the turbine, which drives the generator and produces electricity.



04 Condense and return

Cooling restores the ORC fluid to liquid. The pump returns it to the exchanger for another cycle, while excess heat is rejected to air.



Engineering the complete AGS energy chain

The RRSC and RePG concept combines a sealed underground heat collector with a separate Organic Rankine Cycle, or ORC, at the surface. The project is engineered as one thermal system: the rock supplies energy, the collector transports it, and the power block converts a portion into electricity.

How the two circuits work

Circulating water absorbs heat through the collector wall and returns to a surface exchanger. Across that exchanger, energy passes into an organic working fluid selected for the operating temperature. Vapour expansion drives the turbine and generator. A condenser returns the vapour to liquid and a pump restores the pressure needed for the next cycle. The collector water returns underground within sealed pipework, without being discharged into a geological reservoir.

What determines useful output

Sustainable heat extraction depends on rock temperature, thermal conductivity, collector geometry and the way heat replenishes the surrounding formation. Surface design then matches the available temperature and flow to the turbine, exchanger and cooling system. A deeper collector is not automatically a better project: drilling cost, usable thermal contact and net annual generation must be evaluated together.

Design boundary	Engineering purpose	Required evidence
Underground collector	Collect heat while containing the circulation fluid	Thermal model, integrity and pressure records
Surface exchanger	Transfer heat while separating the fluids	Temperature approach and pressure loss
Power block	Convert the available heat into electricity	Measured gross and net electrical output
Condenser and auxiliaries	Complete the cycle under local weather conditions	Seasonal cooling duty and auxiliary demand

The engineering objective is dependable net energy over the operating year. Collector depth and plant capacity are selected for each site; the process illustrations communicate the architecture.

Sources: S04, S05

Turbine assembly at the Bursa engineering centre

The Bursa programme brings turbine systems, heat exchangers, piping, electrical assemblies and controls into one engineering environment. Original workshop photographs show the physical equipment behind the development programme.



Open turbine and equipment assembly frame.



Fitting components during workshop assembly.

Build against the operating conditions

Source temperature and flow, working fluid pressure, generator output and condenser duty define the equipment specification. Assembly, instrumentation and functional checks prepare the unit for factory acceptance and site integration.

01 / Specify

Match components to the thermal and electrical duty.

02 / Assemble

Integrate mechanical equipment, piping and electrical connections.

03 / Instrument

Establish temperature, pressure, flow and power measurements.

04 / Qualify

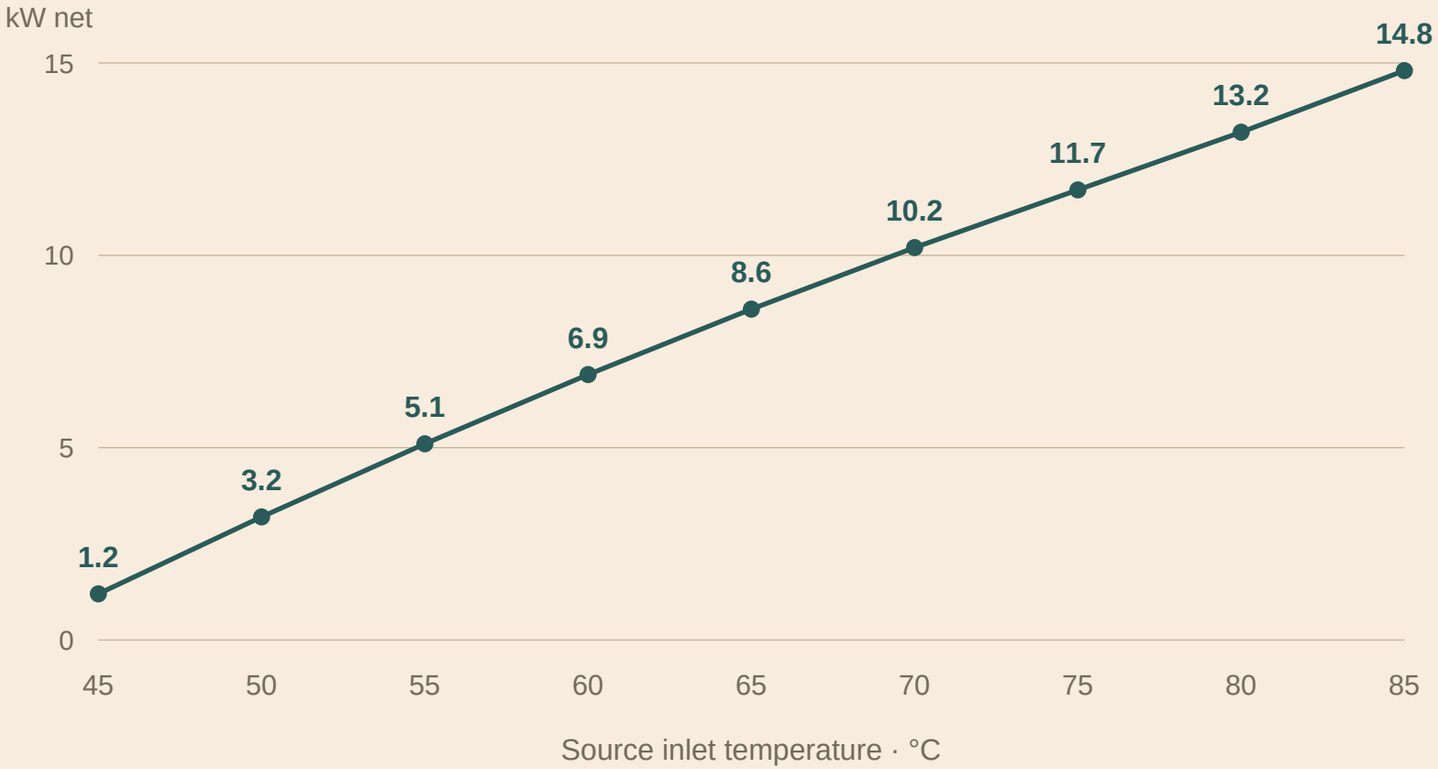
Check operation, auxiliaries and protection before commissioning.

From tested conversion to an integrated AGS plant

Low temperature conversion is valuable when the source, cold sink and auxiliary demand work together. The AFJET curve records 5.1 kW net at a 55 °C source inlet and 0 °C ambient air for the 15 kWe class unit.

AFJET · reported net electrical output

Ambient air held at 0 °C · 15 kWe class unit



5.1 kW net

55 °C source; 0 °C ambient, AFJET curve

TRL 9 / TRL 7

Company reported: surface platform / integrated AGS

Develop the complete installation

Operating surface equipment informs the sealed collector programme. Resource modelling, factory acceptance and site commissioning connect the underground heat supply to seasonal net output. The July 2026 company report assigns TRL 9 to the operating surface platform and TRL 7 to integrated AGS.

D3, pp. 24 to 26; D4, pp. 5 and 18 to 21; D5, pp. 5 to 7.

From Bursa assembly to site qualification

Bursa connects component design, equipment assembly, instrumentation and test preparation. This continuity matters because an AGS plant succeeds through the combined performance of its collector, turbine system, electrical equipment and cooling infrastructure. Manufacturing quality becomes valuable when it produces repeatable operation at the customer’s site.

A specification built around the resource

Engineering starts with source temperature and flow, allowable pressure, working fluid properties, electrical requirements and the local cooling environment. These inputs establish the exchanger duty, turbine operating range, generator rating and auxiliary requirements. They also define access for maintenance, isolation points and the measurements needed to demonstrate performance.

An evidence path for the complete installation

The supplied records identify operating surface conversion equipment and a separate integrated AGS development programme. The company reports TRL 9 for the surface platform and TRL 7 for integrated AGS. Existing ORC experience supplies a strong engineering foundation; the integrated pilot adds evidence for underground heat delivery, plant interfaces and sustained operation.

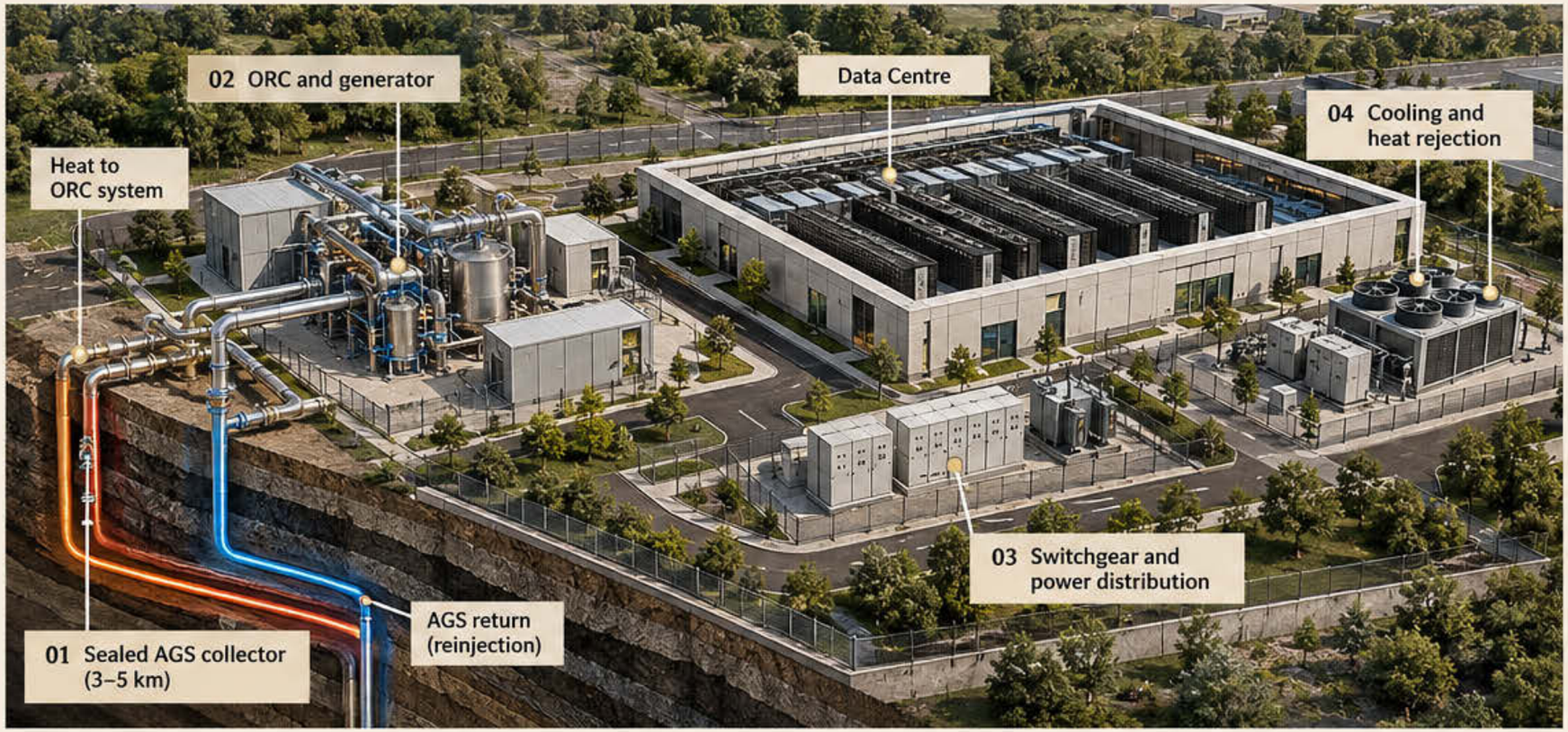
Delivery stage	What is checked	Why it matters
Assembly and instrumentation	Mechanical fit, leak integrity, electrical connections and sensor calibration	Reliable data and maintainable equipment
Factory acceptance	Defined source conditions, cooling duty, net output and protective trips	A repeatable performance baseline
Site commissioning	Collector circulation, plant interfaces, controls and electrical synchronisation	Correct operation of the connected installation
Operating qualification	Seasonal output, auxiliary demand, availability and maintenance	A basis for replication and customer commitments

At AFJET, the supplied controlled curve gives 5.1 kW net at a 55 °C source inlet and 0 °C ambient air. Retaining both conditions makes the result useful when comparing a proposed project with the recorded test.

Sources: S06, S05

Geothermal AGS for data centres

Geothermal AGS provides reliable, continuous energy for data centres. Heat extracted from stabilized underground reservoirs is converted into electricity through an ORC system, while low-temperature heat is used for cooling and other site services. The solution ensures energy security, lower operating costs and a reduced environmental footprint, with a stable, long-term supply independent of the computing load.



01 / Sealed underground AGS collector

A closed-loop system extracts stable heat from deep rock formations and transfers it to the surface without using groundwater.

02 / Convert with ORC

The recovered heat drives an Organic Rankine Cycle (ORC) turbine, generating clean electricity after auxiliary use.

03 / Distribute power

Switchgear and protection equipment connect generation to the data centre and site infrastructure (UPS, grid, reserve).

04 / Cooling and site services

Low-temperature heat is used for chillers and auxiliary services. Residual heat can support other on-site or district applications.

Reliable baseload power
Continuous generation independent of IT load.

Lower operating costs
Reduced electricity purchases and price exposure.

Higher energy security
On-site generation with UPS and reserve integration.

Lower carbon footprint
Clean energy with minimal emissions.

Integrated cooling and heat reuse
Efficient use of recovered heat for data centre and other needs.

AGS as a continuous power source for computing

The principal AGS contribution is a continuous geothermal energy source connected to the data centre’s electrical infrastructure. Underground heat remains available independently of sunlight and wind. The installation is designed to convert that resource into predictable net electricity that can support the campus alongside its other supply and reserve arrangements.

Match the plant to the campus

The starting point is the hourly electricity requirement of the whole facility: IT equipment, cooling, power distribution and supporting services. The AGS plant is then sized against the available thermal resource and the planned campus phases. Modular conversion can support staged development, provided collector capacity, cooling infrastructure and electrical connections are coordinated with each expansion.

Connect generation to protected loads

Power from the generator passes through electrical protection and the site distribution system before reaching the IT supply. UPS equipment bridges disturbances and supports the required power quality. Reserve generation or another qualified supply path addresses prolonged outages and maintenance. Autonomous operation, where specified, requires an engineered control, protection and restart strategy.

Planning question	Project response
What energy can the resource deliver?	Model seasonal net output after circulation, cooling and plant auxiliaries.
How much power does the campus need?	Use facility demand and growth profiles, including cooling and distribution losses.
How is uninterrupted service protected?	Coordinate AGS generation with UPS, reserve supply and electrical protection.
How will performance be accepted?	Define the metering boundary, availability obligations and operating conditions.

The strategic benefit is a local, controllable energy infrastructure that can reduce dependence on purchased electricity. The measurable outcome is the useful energy delivered to the campus over time, together with the continuity standard achieved by the complete electrical system.

Sources: S07, S08, S09

RePG Energy Applications

Datacenter Application (DC)

TURNING WASTE HEAT INTO CLEAN POWER

WASTE HEAT
MORE VALUE
A CLEANER FUTURE

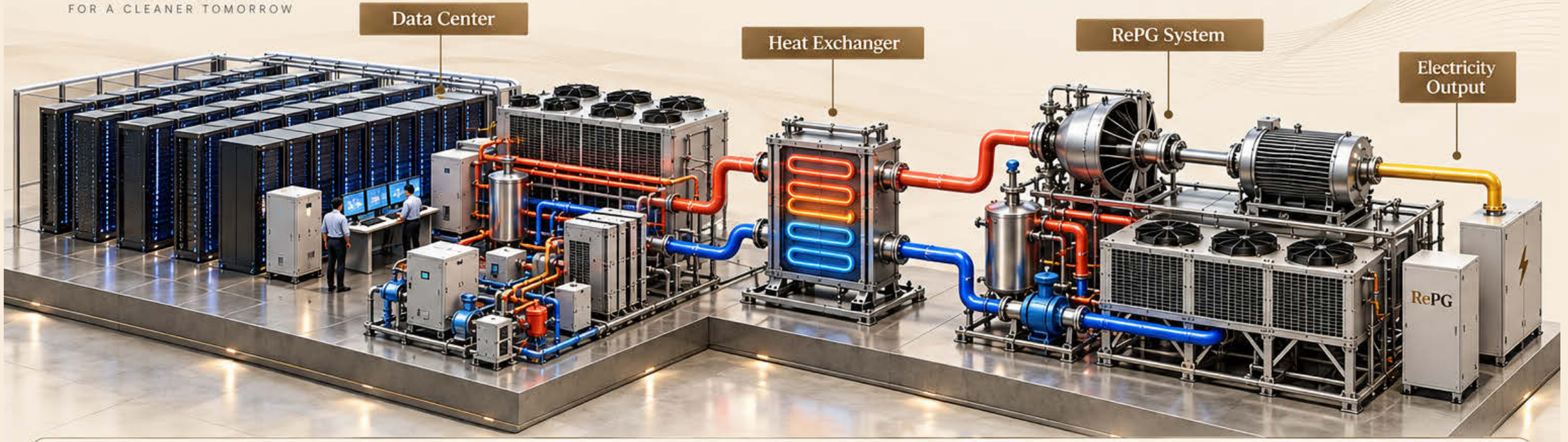
ORC-based heat recovery

Suitable for liquid-cooled data centers

Low-temperature waste heat valorization

Scalable modular integration

CIRCULAR ENERGY
FOR A CLEANER TOMORROW



On-Site Electricity

Convert recoverable waste heat into useful electrical power.

Cooling Optimization

Reduce cooling-system load through integrated heat-recovery, enabling more efficient operation.

Lower Grid Consumption

Use net recovered power to offset facility electricity purchases.

Energy Cost Savings

Lower operating costs when recovered power exceeds additional system costs.

Lower Carbon Footprint

Reduce electricity-related emissions when recovered power displaces grid energy.

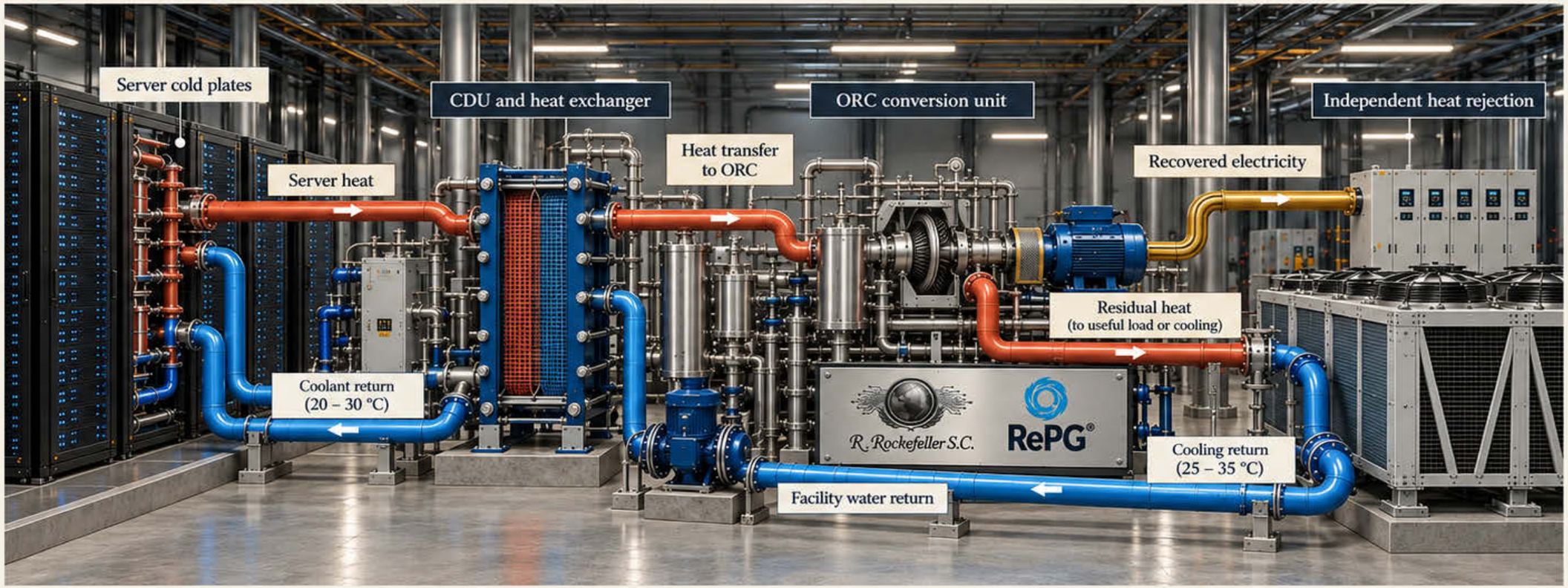
Better Heat Utilization

Put low-temperature processor waste heat to productive use.

Electricity, liquid cooling and heat recovery

Geothermal AGS supplies primary electricity. Server liquid cooling transfers heat to a separate recovery ORC, which can produce additional electricity when temperature and flow are suitable. Residual heat goes to a useful load or cooling system. The fluids remain isolated and return through their own circuits.

Heat transfer (hot) · Cool returns (cold) · Electricity



01 / Capture

Server cooling transfers heat to an isolated exchanger.

02 / Convert

A separate ORC recovers part of that heat.

03 / Reject

Cooling removes residual heat.

04 / Recirculate

Both fluids return within their own circuits.

D1, pp. 15 to 21; D4, pp. 36 and 43; T1 and T2.

Turning server heat into a managed energy resource

Primary geothermal AGS generation and server heat recovery perform different jobs within the same campus. AGS supplies new electrical energy from underground heat. The recovery system captures heat released by computing and directs it to a useful thermal application or, where conditions support it, a separate ORC that produces additional electricity.

Capture heat close to the processors

Liquid cooling transfers processor heat to a controlled coolant circuit. A cooling distribution unit and exchanger isolate server coolant from the facility water network. This arrangement can provide a more useful return temperature and reduce the amount of heat that must be carried through the room by air. Pumps, water quality, temperature control and leak management remain part of the operating design.

Choose the best use for the available heat

The recovery decision depends on temperature, thermal flow, operating hours and the available cold sink. Direct thermal use may suit a nearby building or industrial load. A secondary ORC is evaluated on net recovered electricity after its own auxiliaries. Heat driven cooling requires suitable thermal input and purpose designed equipment. These routes are selected through the campus energy balance.

Thermal path	Useful service	Engineering condition
Server loop to facility exchanger	Continuous removal of IT heat	Respect equipment temperature and flow limits
Facility return to useful load	Heat supplied to another application	Match temperature, demand and operating hours
Facility return to recovery ORC	Additional electricity	Adequate source conditions and positive net output
Remaining heat to external sink	Maintain circulation and temperature	Provide independent rejection capacity

Every heat engine rejects residual heat. The system therefore retains a complete cooling path while recovering the useful fraction. Any claimed saving combines measured recovered electricity with changes in chiller, fan and pump consumption.

Sources: S10, S11, S09

Reliable power and cooling for continuous computing

Combining primary AGS power with liquid heat capture addresses both sides of campus demand: electricity supply and heat removal. Capturing heat near the processors reduces dependence on room air cooling and makes higher temperature heat available for recovery or reuse.



Conceptual visualization of an isolated thermal interface, secondary recovery equipment and an external heat sink. The arrangement illustrates functional separation rather than an installation drawing.

01 / Use ambient cooling

Dry coolers or economisers can reduce chiller hours when climate and IT limits permit.

02 / Recover useful energy

Coordinate thermal reuse and secondary generation with the available temperature and flow.

03 / Protect continuity

Retain suitable heat rejection, UPS and reserve supply through maintenance and disturbances.

04 / Measure the net benefit

Compare recovered electricity and changes in chiller, fan and pump demand.

D1, pp. 17, 19 to 20; D4, pp. 36 and 43; T1, sections 5.6 and 7; T2.

Operate the energy system around continuous service

A data centre energy system is judged by service continuity as well as efficiency. The integration of geothermal AGS, liquid cooling and heat recovery should preserve the required IT conditions through changing weather, equipment maintenance and electrical disturbances. The controls coordinate these functions around an agreed operating envelope.

Keep useful recovery independent of critical cooling

The campus should continue removing server heat when a recovery unit is unavailable. Bypass paths and independent heat rejection allow energy recovery to stop without interrupting the essential cooling duty. Equipment redundancy and isolation are chosen for the required continuity level and the practical maintenance sequence, rather than assumed from the presence of multiple modules.

Control the plant using measured conditions

The supervisory system tracks collector and facility temperatures, circulation flows, electrical output, cooling demand and equipment status. Its purpose is to keep every connected circuit inside its operating limits while selecting the most efficient available combination. During a disturbance, the agreed priority is to preserve IT power and thermal conditions, then restore optimal energy recovery.

Operating situation	Coordinated response	Evidence to record
High outdoor temperature	Adjust rejection duty and generation to the actual cold sink	Net power and cooling margin
Recovery equipment maintenance	Bypass recovery and maintain the cooling path	Stable IT inlet conditions
Electrical supply disturbance	Use the qualified UPS and reserve sequence	Transfer performance and protected load continuity
Normal seasonal operation	Optimise fan, pump and conversion settings together	Campus energy use and useful recovered energy

Report net AGS generation, recovered electricity, cooling consumption and exported useful heat separately. PUE describes facility efficiency; heat reuse and water use require their own indicators. These boundaries make the operational benefit understandable to engineers, customers and financiers.

Sources: S12, S09, S11

Upcoming European AGS Pilot Project

Augusto Innovation Hub, Milazzo, Sicily. The first planned Italian and European pilot of the RRSC and RePG AGS solution connects geothermal development with a technology campus.



AUGUSTO INNOVATION HUB

Official architectural rendering by Giancarlo Zema Design Group.

400 kWe installed

250 kWe average net output is the project reference for the initial installation.

A complete AGS system

Sealed underground collector, surface ORC conversion, condenser and electrical connection to campus loads.

A European reference

The pilot is intended to establish operating evidence for subsequent campus, data centre and industrial applications.

Planned project. Design references and delivery scope are explained in the following pages.

Augusto: our first AGS pilot in Italy and Europe

At Augusto Innovation Hub in Milazzo, Sicily, RRSC and RePG are developing their first Italian and European AGS pilot: a sealed geothermal heat collection system coupled to a modular electricity generating unit.



Official Augusto Innovation Hub architectural rendering by Giancarlo Zema Design Group.

400 kWe
Installed electrical power

250 kWe
Average net power reference

2,000 MWh
Annual net energy reference

8,000 h
Annual operating reference

90°C inlet / 70°C return

Surface operating reference. Annual energy assumes 250 kW net over 8,000 hours. Final site performance will be established through detailed design and acceptance testing.

The campus architecture envisages staged expansion towards 1 MW as its energy requirements grow.

An energy system for the Augusto campus

The 47,000 m² former Montecatini site will host advanced computing, cybersecurity, research and virtual production. AGS will support data infrastructure and continuous loads alongside photovoltaics. Project communications describe regional and European funding support for the wider hub.

From Bursa engineering to Milazzo delivery

RePG supplies the generating unit and condenser, delivery, machine installation and commissioning supervision. The reference installation area is 15 × 20 metres. RRSC coordinates the technology; drilling, civil works and external connections are separate site packages.

D6, pp. 1, 4, 5 and 8; W2, W3 and W6. Project in development; technical values are design references.

Augusto: a technology campus with its own energy programme

Augusto Innovation Hub is a programme to regenerate the former Montecatini industrial site in Milazzo, Sicily, into a European technology campus. Geothermal AGS is part of its planned energy infrastructure, alongside the architectural redevelopment and the activities the new campus is intended to support.

What the wider project brings together

The approximately 47,000 m² site is being developed for Super Intelligence, cybersecurity, digital infrastructure, research and a distinct virtual production activity. Fabrizio Crimi leads the Augusto initiative, with architectural design by Giancarlo Zema Design Group. The programme connects industrial regeneration with advanced computing and creative technologies, giving energy infrastructure a practical role in the site's future operation.

Why the AGS pilot matters

Milazzo is planned as the first Italian and European pilot within the RRSC and RePG AGS programme. Its purpose is to integrate underground heat collection, surface power conversion and campus electricity requirements in one real project. This creates a setting in which the complete installation can be commissioned, monitored and evaluated against defined operating conditions.

Part of the programme	Role within Augusto
Technology campus	Host digital, research, cybersecurity and virtual production activities.
Initial AGS installation	Develop the quoted 400 kWe unit with a 250 kWe average net reference.
Energy integration	Coordinate geothermal electricity with campus loads and planned photovoltaic generation.
Future development	Evaluate staged AGS expansion towards 1 MW as the campus and resource case develop.

Project communications describe €100 million for the initial wider hub phase and a planned programme of €200 million by 2028, with public support and additional private investment. These figures describe the campus programme; the AGS pilot has its own engineering, procurement and delivery scope.

Sources: S30, S31, S32

A pilot designed to establish a repeatable AGS installation

The proposed Augusto installation combines a sealed geothermal collector with a separate surface ORC power unit. Heat crosses the exchanger without mixing the two fluids. The turbine and generator produce electricity, while a condenser completes the organic fluid cycle and the collector circuit returns underground.

A defined technical reference

The RePG project reference specifies 400 kWe installed capacity and 250 kWe average net output. Its annual reference is 2,000 MWh over 8,000 operating hours, with surface inlet and return temperatures of 90°C and 70°C. The indicated machine installation area is 15 × 20 metres. These parameters guide detailed engineering and the eventual site acceptance criteria.

Coordinating the complete installation

RePG's proposed package covers the generating equipment, condenser, delivery, machine installation and commissioning supervision. The project also requires site investigation, drilling, associated underground works, civil preparation and external electrical and piping connections. RRSC coordinates the technical programme, while the project participants define the responsibilities and acceptance conditions for each interface.

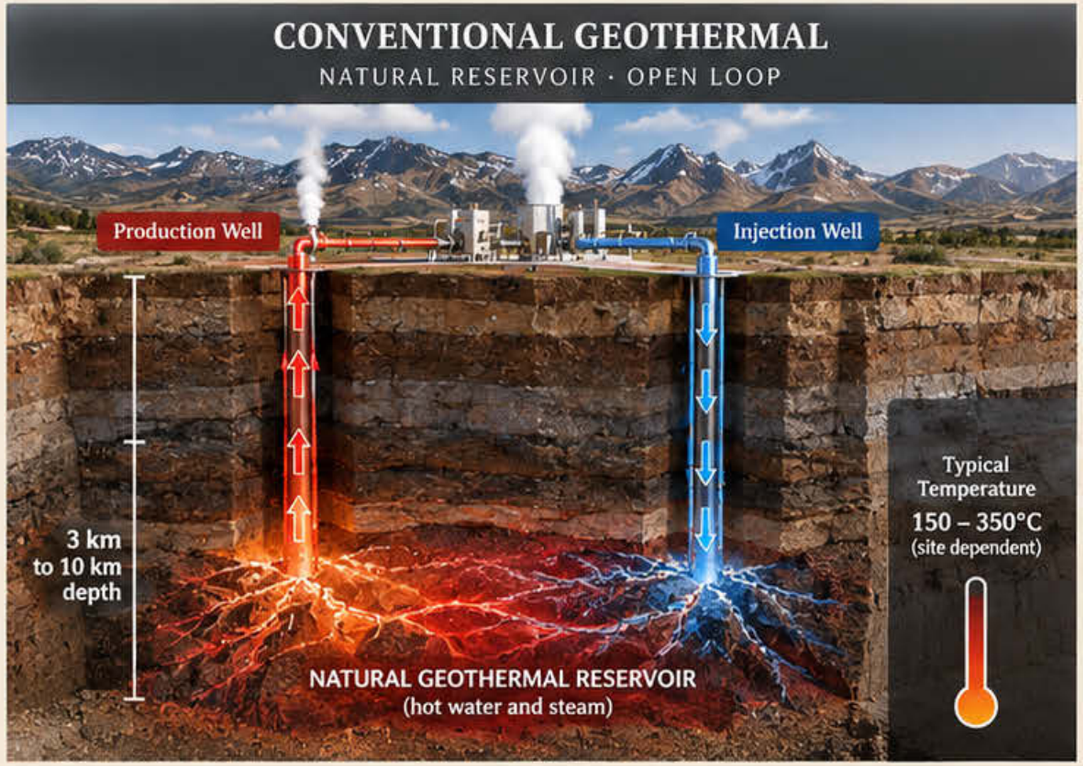
Qualification stage	What the pilot must establish
Resource and collector	Sustainable thermal delivery, circulation requirements and a suitable construction design.
Factory and site integration	Equipment readiness, safe connection and coordinated electrical and thermal controls.
Measured operation	Net electricity, auxiliary consumption, cooling duty, availability and seasonal behaviour.
Replication package	A transferable design basis, operating record, maintenance plan and project cost structure.

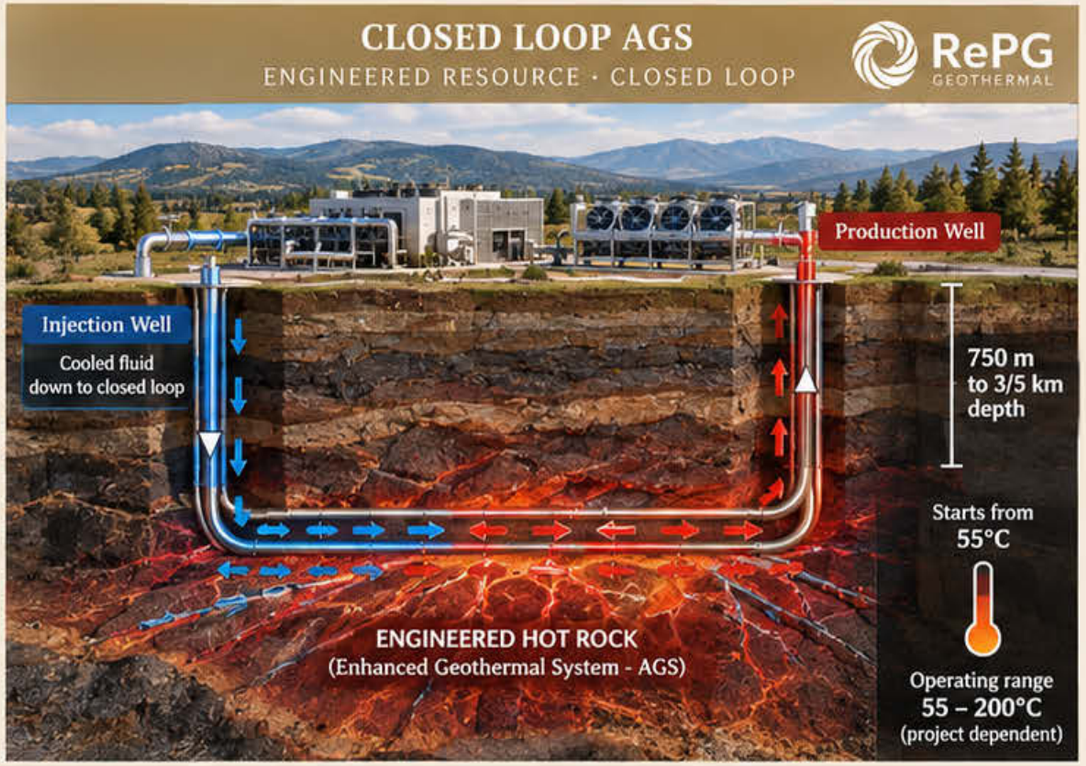
The strategic result is an operating reference that supports future customer decisions and project finance. It connects the engineering capability in Bursa with a European campus application, creating evidence that can inform subsequent AGS installations for data centres and continuous industrial demand.

Sources: S33, S05, S34

Geothermal AGS versus conventional geothermal

Geothermal AGS circulates fluid inside sealed pipework. Conventional geothermal plants produce natural reservoir water and return it through reinjection. Both recover underground heat, through different resource architectures.





Architecture	Conventional Geothermal	Closed Loop AGS
Underground fluid path	Natural resource water is produced and reinjected	Confined within sealed pipework (closed loop)
Depth range	3 km – 10 km	**750 m – 3/5 km**
Starting temperature	~ 150 – 350°C (site dependent)	Starts from **55°C** and operates at 55 – 200°C (project dependent)
Engineering emphasis	Productive fluid resource, chemistry and well performance	Thermal contact, collector area and circulation

Sealed circulation reduces dependence on naturally productive fluid reservoirs and keeps formation fluids underground. In indirect AGS, separate collector and ORC circuits simplify fluid isolation and maintenance. Low temperature conversion broadens candidate applications where the complete site economics work. EGS circulates fluid through engineered rock fractures.

D5, pp. 5 to 7 and 9 to 10; D1, pp. 8 to 14; AG1 and AG2.

Why the sealed AGS architecture changes the opportunity

Closed loop AGS changes how underground heat is collected. Its circulating fluid stays inside engineered pipework, so the design can access suitable heat without requiring a naturally productive water reservoir. This creates a different development opportunity from conventional hydrothermal generation and from Enhanced Geothermal Systems, or EGS.

The specific value of fluid containment

Keeping formation fluids underground reduces dependence on reservoir water productivity and avoids bringing that fluid into the plant’s heat collection circuit. In the RRSC and RePG indirect arrangement, a second exchanger boundary also separates collector water from the organic working fluid. These interfaces support a controlled equipment specification, modular surface conversion and defined maintenance responsibilities.

The resource is qualified in a different way

Conventional projects investigate temperature, productive flow and reservoir behaviour together. A sealed AGS project emphasises thermal contact with the rock, collector construction, fluid containment and circulation demand. Engineering demonstrates how much heat can be delivered sustainably and at what cost. Low temperature conversion can broaden the candidate resources when the available heat and local cooling conditions support useful net generation.

Attribute	RRSC / RePG sealed AGS	Conventional hydrothermal
Heat collection	Heat crosses the collector wall	Hot reservoir fluid is produced
Fluid path	Contained within engineered pipework	Production and reinjection wells connect to the reservoir
Resource emphasis	Temperature, conductivity and collector contact	Temperature, productive flow and reservoir continuity
Surface conversion	Separate ORC selected for the thermal duty	Conversion selected for the reservoir conditions

EGS is another major advanced geothermal route: it creates or improves flow through rock fractures. It is commercially relevant to the wider sector, while the sealed collector architecture remains the defining feature of the AGS concept described here.

Sources: S13, S08, S14

R. Rockefeller S.C.

RePG GEOTHERMAL AGS

Geothermal AGS Global Analysis Market

The financial case for advanced geothermal systems



Illustrative visualisation

950 TWh

Data centre demand · 2030

IEA central projection

USD 2.2bn

Fervo gross IPO proceeds · EGS

Approximate · before offering costs

EUR 221.6m

Eavor bank financing + EU grant

Geretsried package · 2024

Where RRSC and RePG create financial value

Global demand, signed power contracts and disclosed financing show an expanding commercial market. RRSC and RePG's opportunity connects specialist AGS capability with qualified customers and repeatable delivery.

GLOBAL MARKET SIGNALS

950 TWh

2030 global data centre demand

IEA central projection

396 MW

Google / Fervo signed PPA

EGS supply · expected online 2028

EUR 221.6m

Eavor / Geretsried · 2024

EUR 130m bank package + EUR 91.6m grant

01 Lower temperature conversion

The 5.1 kW net test at 55 °C inlet and 0 °C ambient identifies a conversion capability that can widen the resource options assessed for a project.

02 Modular deployment

Repeatable conversion units can match the available resource and follow a customer's expansion, connecting engineering choices to phased investment.

03 Integrated Bursa engineering

Bursa connects turbine equipment, exchangers, controls, assembly and operating experience, supporting qualified equipment and a repeatable supply scope.

04 International development

Resource assessment, collector design, customer requirements and delivery partners are brought into one programme with defined commercial responsibilities.

The investment proposition

Qualify the full energy chain, demonstrate net output and secure a durable customer contract. Integration creates a commercial advantage when the source, cooling conditions and installed cost support competitive electricity.

The 55 °C result is a controlled test, not a guarantee for every site. Market figures are external benchmarks; the Geretsried package is financing, not total project cost.

RRSC AGS report · IEA demand projection · Fervo / Google PPA · EIB / Geretsried financing

A wider market with distinct technical strategies

Closed loop AGS specialists compete for customers and capital alongside EGS developers and advanced drilling companies. Architecture, development stage and commercial role must be read together.

Platform	Architecture and focus	Commercial position
RRSC / RePG	Sealed circuit AGS; low temperature conversion	Integrated engineering and modular conversion; Milazzo pilot programme.
Eavor	Closed loop; connected multilateral wells	Geretsried has supplied grid electricity since December 2025.
XGS Energy	Closed loop; conductive heat transfer materials	150 MW development agreement supporting Meta in New Mexico.
GreenFire Energy	GreenLoop closed loop exchange; well retrofit	Reported 7.4 MWth test at The Geysers; Baker Hughes investment.
CeraPhi	Closed loop collection; well repurposing	KM8 demonstrator; thermal services and heat network development.
Green Therma	Heat4Ever; insulated circulation	GFZ heat demonstration, September 2026; useful thermal applications.
Fervo Energy	Enhanced Geothermal Systems (EGS)	Listed developer; utility scale projects and hyperscaler PPAs.
Sage Geosystems	Pressure Geothermal / EGS	Generation and storage; Ormat backed commercial development.
Quaise Energy	Superhot geothermal; advanced drilling	Deeper, hotter resource access with industrial drilling partners.

Two competitive dimensions

Technical routes differ. Commercially, these platforms compete for long term customers, specialised capital and credible delivery capacity.

RRSC’s chosen application space

Low temperature conversion, modular equipment and coordinated international execution define the platform’s proposition within the closed loop AGS segment.

Nine selected platforms, not a worldwide company census. Fervo and Sage are financial comparators; their reservoir based approaches differ from sealed circuit AGS.

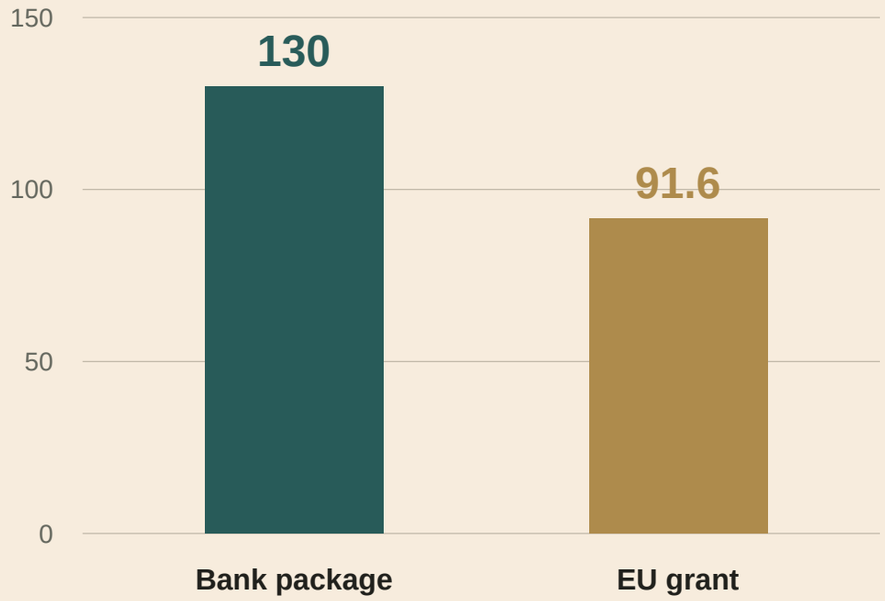
Eavor · XGS · GreenFire · CeraPhi · Green Therma · Fervo · Sage · Quaise

From technology capital to financed infrastructure

Equity, project debt and grants fund different stages of development. The transactions below show growing access to capital while preserving the original instrument, currency and project perimeter.

EAVOR / GERETSRIED · 2024 · EUR MILLION

A combined funding structure



The roughly EUR 45m EIB loan is included within the EUR 130m lender package.

USD 2.2bn

Fervo IPO · May 2026

Approximate gross proceeds, including the full underwriters' option and before offering costs.

USD 421m

Fervo Cape Station · Q1 2026

Non recourse project debt for the first phase, separate from corporate equity.

Sage

USD 97m+

Series B
January 2026

Quaise

USD 180m

Final Series B
August 2026

Eavor / CGF

About CAD 138m

Up to, committed
June 2025

Sage exceeds USD 97m. Quaise includes USD 35m from Nabors. CGF: approximately CAD 89m at close and CAD 48m subject to milestones.

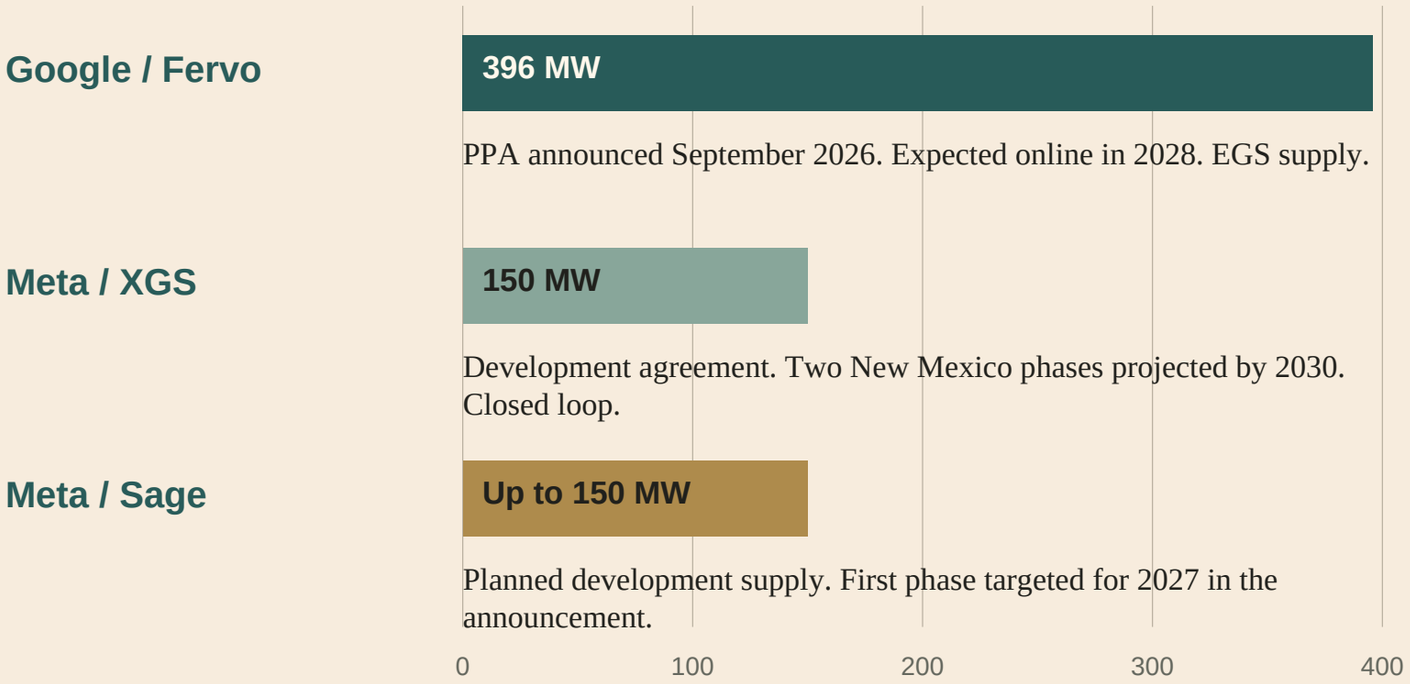
Original currencies and instruments, not a combined valuation. Sage was co led by Ormat and Carbon Direct Capital. Quaise's final USD 180m includes its earlier first close.

Fervo results · EIB / Eavor · Canada Growth Fund · Sage financing · Quaise final close

Global technology buyers are contracting geothermal power

Large customers are translating continuous electricity needs into power purchase agreements and development partnerships. Contract status is as important as announced capacity.

ANNOUNCED PROGRAMME CAPACITY · MW



Commercial priority: connect each RRSC AGS offer to a qualified customer, a credible delivery date and a durable energy agreement.

STRATEGIC CAPITAL AND EXPERTISE

bp · Chevron Microsoft

Investors in Eavor at different stages. Their participation demonstrates institutional interest in advanced geothermal.

Ormat · Baker Hughes Nabors

Ormat backs Sage. Baker Hughes collaborates with XGS and invests in GreenFire. Nabors invests in Quaise, linking capital with industrial execution.

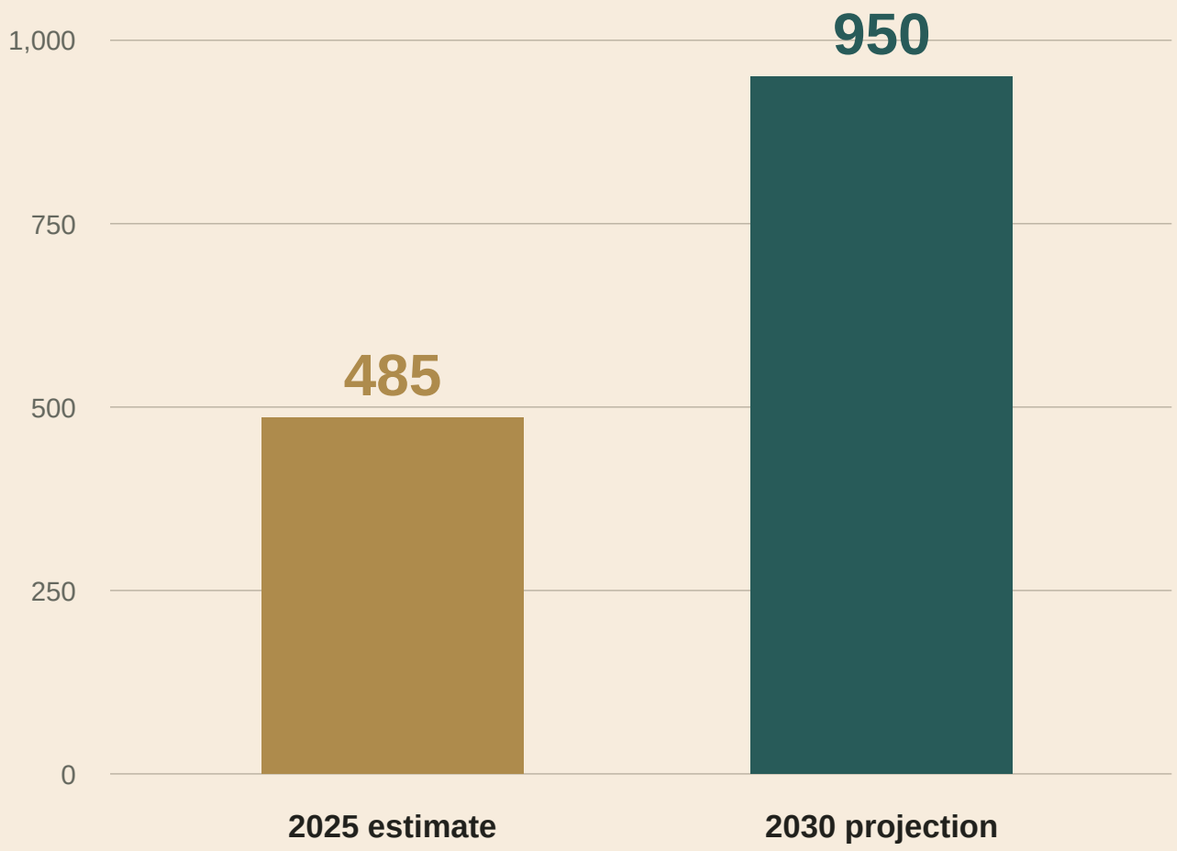
Bars compare announced capacity, not operating assets or equivalent contract types. The Fervo agreement also includes an approximately 600 MW option, excluded here. External examples imply no relationship with RRSC.

Fervo / Google · XGS / Meta · Sage / Meta · Eavor investors · Baker Hughes / XGS

A demand pool approaching 1,000 TWh a year

The IEA central projection points to a major expansion in global data centre electricity use. AGS addresses a potential portion of this need through firm power where resource quality and project economics align.

GLOBAL DATA CENTRE ELECTRICITY DEMAND · TWH / YEAR



+96%

Approximate demand growth from 2025 to 2030

+465 TWh

Additional annual electricity demand in the central projection

Why this matters for AGS

Computing infrastructure needs dependable power over long operating periods. A suitable AGS installation can connect continuous generation, local infrastructure and long term customer contracts.

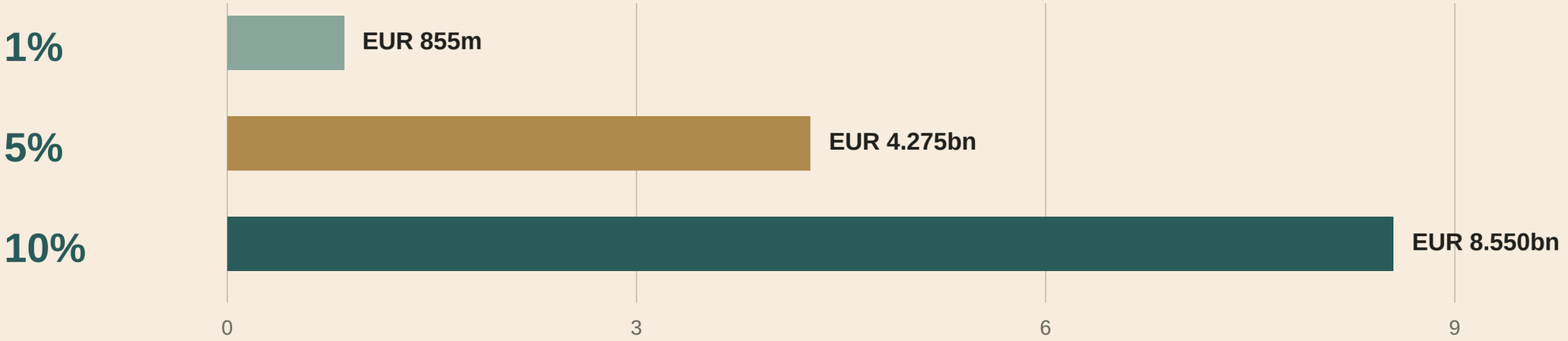
IEA 2026 central projection across all energy sources. This chart describes data centre demand; it is not an IEA forecast of AGS deployment or RRSC revenue.

IEA · Key Questions on Energy and AI, 2026

What a small share of global demand could represent

These scenarios translate a hypothetical AGS contribution to the IEA 2030 demand projection into electricity, net capacity and annual sales. They make the scale explicit without assigning a market share to RRSC.

ANNUAL ELECTRICITY SALES · EUR BILLION



Share of 2030 demand	Annual AGS electricity	Net capacity at 90%	Annual electricity sales
1%	9.5 TWh	1.20 GW	EUR 855m
5%	47.5 TWh	6.02 GW	EUR 4.275bn
10%	95.0 TWh	12.05 GW	EUR 8.550bn

Basis: 950 TWh annual demand, 90% net capacity factor, 8,760 hours and EUR 90/MWh. Sales are before costs. Hypothetical AGS scenarios, not an IEA AGS projection or RRSC forecast, profit or valuation.

IEA demand basis · RRSC AGS Global Market Report · scenario methodology

The annual sales potential of one net megawatt

Net generation and the realised electricity price determine sales. The matrix below makes those two drivers explicit before operating costs, taxes, financing and returns are assessed.

ANNUAL GROSS ELECTRICITY REVENUE · EUR / 1 MW NET

Net capacity factor	Net MWh per year	EUR 70 per MWh	EUR 90 per MWh	EUR 110 per MWh
80%	7,008	490,560	630,720	770,880
90%	7,884	551,880	709,560	867,240
95%	8,322	582,540	748,980	915,420

Net capacity factor includes resource availability and operating effects. Energy is measured after plant auxiliaries, so their consumption is not deducted a second time.

EUR 709,560

Annual sales in the central illustration

1 MW net × 8,760 h × 90% × EUR 90/MWh

EUR 78,840

Annual sales change for each EUR 10/MWh price movement at 90% net capacity factor

Revenue is the starting point

Cash flow depends on the complete installed cost, operating obligations and financing terms.

Sensitivity illustration, not an RRSC forecast or guaranteed profile. No project return or payback is asserted without a complete investment and operating budget.

RRSC AGS Global Market Report · transparent sensitivity calculation

A financeable AGS project needs a complete investment case

Technical performance becomes investable when the project defines its installed scope, customer revenue, operating obligations and contractual responsibilities. A conversion unit quotation is only one part of that case.

01

ENGINEER

Resource and full installed scope

Resource studies; drilling and underground collectors; conversion; cooling; electrical connection; civil works; commissioning; contingency and construction finance.

02

CONTRACT

Reliable and measurable revenue

Power price, tenor, indexation, delivery profile, curtailment and payment security. Self consumption uses the avoidable bill under the real tariff. Useful heat and cooling value is measured separately.

03

OPERATE

Cash flow available to investors

Deduct maintenance, insurance, staffing, consumables, reserves and taxes from revenue. Assess debt service, lender ratios and equity returns against the full operating profile.

INDEPENDENT ACCEPTANCE → DOCUMENTED RESPONSIBILITIES → PROJECT FINANCING

Resource performance, seasonal net output and contract rights support financing assessment. Investment decisions require the complete project model; no undisclosed return or guaranteed outcome is assumed.

RRSC AGS Global Market Report · financing structure and project assessment

Five channels connect engineering to portfolio value

RRSC and RePG combine technology and manufacturing with international origination, customer access and project coordination. Commercial value is created through activities that can be defined, delivered and measured.

Value channel	Commercial activity	Evidence supporting scale
Technology and equipment	Conversion package and agreed technical scope	Accepted output, documented interfaces and manufacturing quality.
Development and integration	Site qualification, load matching and delivery coordination	Resource assessment, permits, full budget and accountable contractors.
Operations and service	Performance support, maintenance, monitoring and spares	Service obligations, availability records and operating procedures.
Project participation	Agreed project profit and technology proceeds	Defined economic rights, auditable costs and payment mechanisms.
Replication	Repeat the qualified design across further suitable sites	Standard documentation, acceptance criteria and local execution capability.

Capital at the right level

Plant investment is organised with customers or project companies under the agreed structure. RRSC coordinates technology and international development, with commercial rights and responsibilities established for each installation.

Strategic development model based on the supplied RRSC report. Economic flows depend on the relevant contracts and delivered projects; no undisclosed valuation or guaranteed return is assigned.

RRSC AGS Global Market Report · chapters 4 and 5

The reference project is the bridge to repeatable growth

A successful pilot creates more than an individual installation. It can establish the evidence, delivery scope and contracting package needed to develop the next qualified AGS projects.

INVESTMENT AND OPERATING CASH FLOW

01 Validate the pilot
Measured net output and installed scope

02 Contract the revenue
Price, tenor, delivery and payment terms

03 Fund the project
Customer or project company capital

04 Deploy the capital
Equipment, construction and commissioning

05 Earn and operate
Revenue funds operating costs and service

06 Allocate available cash
Debt service and equity after obligations

01 Qualify the reference

Use Augusto in Milazzo to establish measured net electricity, seasonal performance, operating procedures and independent acceptance.

02 Contract the customer service

Define the delivered energy, interfaces, commercial rights, responsibilities and payment milestones around a complete installed scope.

03 Finance each installation

Match the qualified site and customer with project capital, delivery contracts and an operating plan suited to the actual resource.

04 Replicate and support

Repeat proven configurations, localise execution and develop continuing service and contracted commercial flows.

Technology + evidence + contracts + execution

Augusto is a development programme. Its financial contribution is the creation of a credible reference package, not an assumed revenue, operating result or financing approval.

RRSC AGS Global Market Report · strategic development pathway

Recovering useful power from industrial heat

Dryers, ovens, steam networks and compressor circuits can retain useful heat after their primary duty. A separate recovery system converts part of that heat into electricity while preserving the host process. Source temperature, flow, operating hours and cooling conditions determine the contribution. The scene illustrates an industrial application; the next page presents operating references.

Heat / hot exhaust Cool returns Exhaust / air Electricity



Conceptual industrial heat recovery; source, conversion and cooling remain separate.

01 / Identify the source

Measure available heat and preserve the production process requirements.

02 / Transfer the heat

An exchanger keeps the industrial stream separate from the conversion circuit.

03 / Generate electricity

Working fluid expansion drives a turbine and connected generator.

04 / Reject heat and return

The condenser removes residual heat; the pump recirculates the fluid.

D1, pp. 24 to 32; D3, pp. 11 to 12; D4, pp. 27 to 30.

Integrating recovery with a working industrial process

Industrial recovery starts with energy that a production process already rejects. An ORC can convert a useful portion into electricity when the source has a suitable temperature, flow and operating pattern. The integration is designed around the host plant so that production quality and throughput remain the first operating requirements.

Qualify the heat before selecting the equipment

A source survey establishes the temperature profile, available flow, seasonal variation and annual operating hours. The same survey identifies contaminants, pressure constraints and maintenance access. Flue gas, flash steam, hot water and compressor cooling oil require different interfaces. The heat exchanger is selected for the actual stream and for the amount of heat that can be removed without affecting production.

Integrate the whole recovery cycle

The recovered heat vaporises the separate working fluid, which expands through the turbine and drives the generator. Condensation and recirculation complete the cycle. The design includes a suitable cooling sink, circulation equipment, protective controls and a bypass or isolation arrangement for host plant maintenance. Electrical output is metered after the relevant recovery auxiliaries.

Source condition	Integration decision	Commercial significance
Variable heat flow	Choose the operating range and control strategy	Annual energy follows the actual production profile
Dirty or corrosive stream	Select exchanger materials and cleaning access	Maintain thermal transfer and equipment availability
Sensitive production duty	Define allowable heat extraction and bypass operation	Protect the host plant’s primary output
Restricted cooling capacity	Match condenser design to local conditions	Preserve useful net generation in warm periods

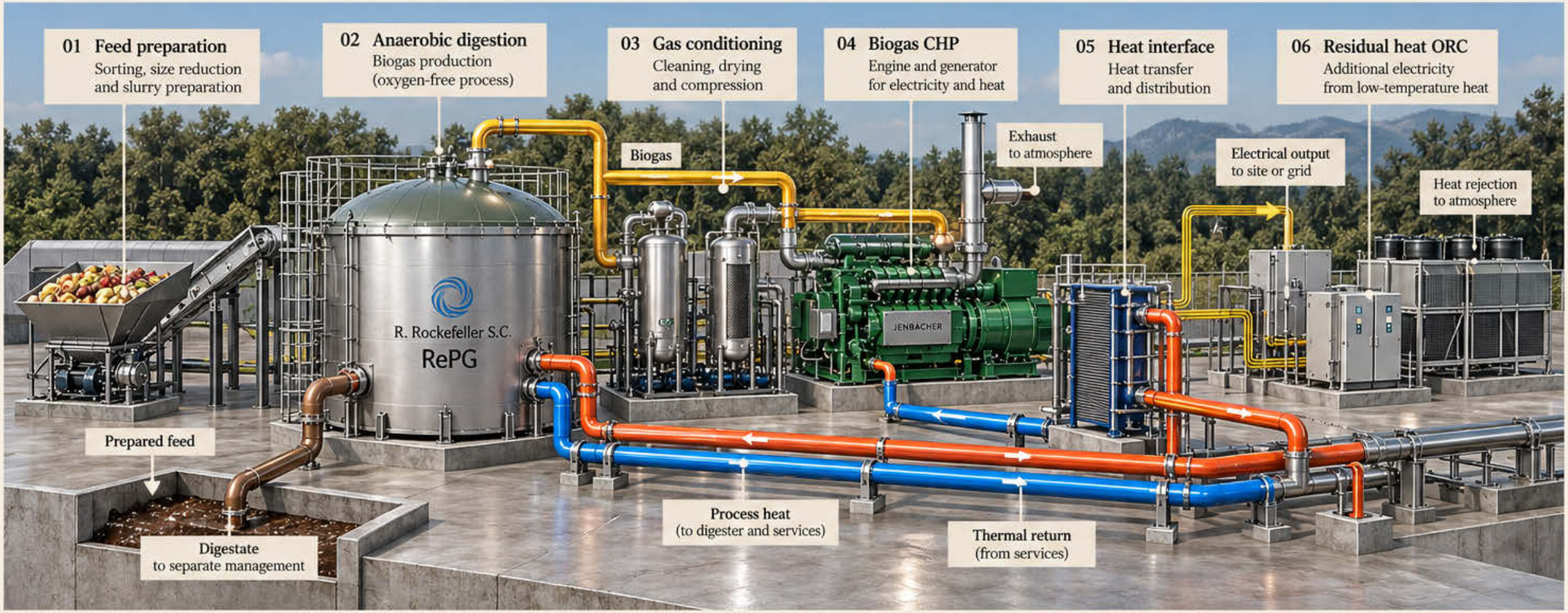
The value is assessed through annual net generation and the electricity it can replace, alongside maintenance and installation costs. Bursa’s experience with multiple industrial sources helps turn this assessment into a repeatable equipment and integration programme.

Sources: S15, S05

Fruit and food residues become an energy resource

TURNING ORGANIC RESIDUES INTO USEFUL ENERGY

Suitable peel, pulp and food processing residues can supply a controlled biogas process. The useful result combines electricity with heat allocated to digestion and factory services. Additional ORC recovery uses only suitable remaining heat. This is an application pathway for project development, rather than a claimed operating RRSC fruit processing installation.



01 / Prepare the feed

Separate contaminants and establish a consistent organic feed.

02 / Digest without oxygen

Microorganisms produce biogas; digestate follows a separate management route.

03 / Condition and generate

Clean the gas for an engine driving an electrical generator.

04 / Use and recover heat

Supply process heating, then evaluate residual heat for additional ORC electricity.

From food residues to useful energy

Fruit residues and suitable food processing byproducts can become a local energy resource when collection, biological treatment and energy use are designed together. Anaerobic digestion provides a route for wet organic materials that would otherwise require disposal or further treatment.

Prepare a dependable feedstock

The process begins with a measured supply of suitable residues. Packaging and contaminants are separated before preparation and controlled feeding. Composition, moisture and seasonal availability determine the design. Different compatible organic streams can be blended, with the operating recipe matched to stable digestion rather than simply accepting the maximum incoming volume.

Convert and use the biogas

Microorganisms break down the prepared material in an enclosed reactor without oxygen, producing biogas and digestate. Biogas treatment prepares the fuel for the selected equipment. In the illustrated route, a combined heat and power unit produces electricity while recovered engine heat supports the digester and suitable factory services. An additional ORC recovery stage is considered only where a sufficient thermal resource remains after these demands.

Complete the material and energy balance

Digestate leaves through a dedicated handling route, with treatment and an identified destination appropriate to its composition. Pumps, mixing, gas treatment and cooling are included in the electrical balance. The useful result is net delivered electricity, heat actually consumed and managed residual material. This makes the application relevant to food factories, agricultural processing sites and coordinated clusters with reliable residue supply.

What defines a successful installation

Stage	Useful output	Performance measure
Residue preparation	Consistent digester feed	Tonnes accepted and rejected
Biological conversion	Biogas and digestate	Gas volume and methane content
Energy conversion	Electricity and useful heat	Net kWh and heat delivered
Residual management	Qualified material destination	Quantity, quality and traceability

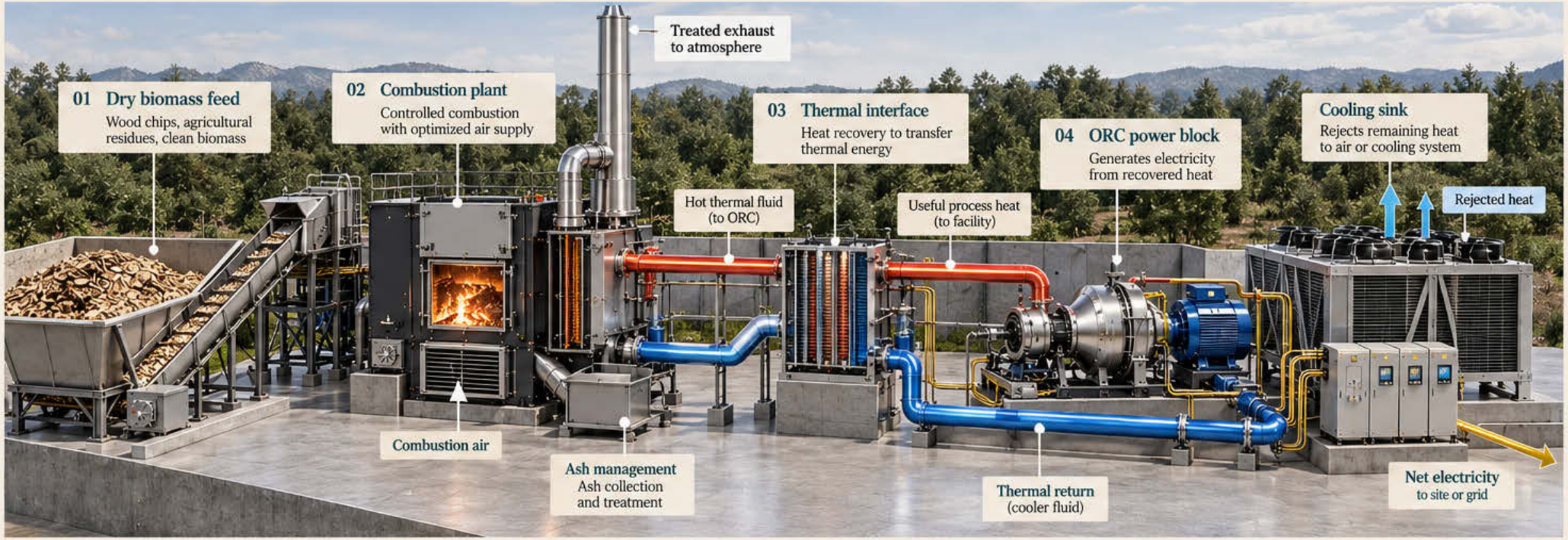
The engineering opportunity is to connect an existing industrial material stream with a dependable local demand for electricity and heat.

Sources: S17, S18, S19

Dry biomass supplies heat and power

TURNING BIOMASS INTO USEFUL ENERGY

Clean wood and suitable agricultural residues can serve a thermal plant matched to their moisture, size, composition and dependable supply. The illustrated route uses combustion. Gasification and pyrolysis are separate process choices with different equipment and products. Useful electricity and delivered heat share one complete energy balance, including treatment and auxiliary consumption.



01 / Prepare the fuel



Check moisture, contaminants and size before controlled feeding.

02 / Release thermal energy

Combustion supplies heat; exhaust and ash follow dedicated treatment routes.

03 / Allocate useful heat

Serve process demand and the selected conversion heat exchanger.

04 / Convert and cool

ORC generation supplies electricity while a condenser completes the fluid return.

A complete thermal route for dry biomass

Suitable wood and agricultural residues can supply a thermal plant. The illustrated configuration uses controlled combustion, a useful heat circuit and electricity conversion, designed around the available fuel and actual site demand.

Match the plant to the material

Fuel preparation establishes a consistent size, moisture range and composition. Storage and feeding must accommodate seasonal supply and allow controlled delivery to the combustion chamber. The selected fuel specification also determines ash handling and exhaust treatment. Clean biomass and mixed industrial waste require different assessments and should not be treated as interchangeable inputs.

Transfer heat into useful services

Combustion releases heat into a thermal interface, which can serve production processes and an ORC module according to the required temperatures. Inside the separate ORC circuit, the working fluid is heated, expanded through the conversion equipment, condensed and pumped back. The source circuit and conversion fluid remain physically separate. The allocation of heat follows the plant design, so electricity and useful heat are counted within one energy balance.

Design for sustained operation

A dependable installation needs predictable fuel deliveries, a sufficient heat sink and accessible maintenance. Fans, feeders, pumps and cooling equipment consume electricity and are included when reporting net output. Exhaust and ash follow dedicated treatment routes. Gasification and pyrolysis are alternative conversion routes with different equipment and products; they are not additional stages automatically included in the illustrated combustion plant.

Engineering inputs and measurable outputs

Design input	System response	Operating measure
Fuel quality and delivery	Storage and controlled feeding	Moisture and fuel consumption
Factory heat demand	Thermal distribution circuit	Useful heat delivered
ORC source and cooling	Electricity conversion	Net power and annual energy
Exhaust and ash	Treatment and collection	Emissions and residue records

The strongest application combines a reliable residue supply with year round demand for the heat and electricity produced.

Sources: S20, S21, S22

Completed pilot projects and operating references

Documented RePG installations span geothermal return water and industrial heat recovery. These practical references complement the planned integrated AGS pilot at Augusto.



Aydın / geothermal return water

150 kW installed; 100 kW net. The documented source is reinjection water at 120°C to 90°C.



Battery plant / industrial exhaust

25 kW installed; 12 kW net. The reference uses flue gas from an industrial process.



Plaster plant / process heat

25 kW installed; 15 kW net. The documented flue gas range is 100°C to 80°C.

Different resources, a shared conversion capability

Geothermal water and industrial waste heat supply the conversion equipment directly. Organic residues and biomass follow the biological or thermal routes described earlier. Each project is identified by its actual source and documented status.

Company reference data from the supplied RePG dossier. The following pages retain the original installation photographs and operating records.

Operating references for surface conversion

Documented installations show the surface ORC platform working with different thermal resources. They provide practical experience for equipment development and integration.



Hayat Kimya: original RePG installation photograph.



AFJET: original RePG installation photograph.



Pirelli Prometeon: flash steam recovery.



Borusan Mannesmann: compressor heat recovery.

Hayat Kimya

Industrial flue gas recovery. Company records report a 75 kWe module, 48.4 kW average net output and 205.5 MWh over the initial 4,248 hour monitored period.

AFJET

Recovery from an existing geothermal reinjection circuit. The reported operating point is 12.7 kW net, with source water cooling from 72 to 66 °C at 25 m³/h.

Pirelli Prometeon

The documented application recovers heat from flash steam within the production steam network.

Borusan Mannesmann

The recovery module uses thermal energy from compressor cooling oil through a separate exchanger.

Surface conversion experience supports the integrated AGS development programme.

D5, p. 10; AG3; D1, pp. 68 to 71; D3. Company reported applications and operating data.

What the operating references demonstrate

The documented installations demonstrate how the RePG surface conversion platform works with different available heat streams. Their value extends beyond a single output figure: they show the operating context, source interface, monitored energy and integration experience that inform later equipment development and project selection.

Two measured thermal environments

Hayat Kimya represents industrial flue gas recovery. The supplied records describe a 75 kWe module delivering 48.4 kW average net output and 205.5 MWh during an initial monitored period of 4,248 hours. AFJET represents recovery from an existing geothermal reinjection circuit, with a reported operating point of 12.7 kW net as source water cools from 72 to 66 °C at 25 m³/h.

A broader integration experience

The Pirelli Prometeon reference addresses heat in flash steam from an industrial steam network. Borusan Mannesmann uses compressor cooling oil through a separate heat exchanger. These different host streams develop practical knowledge in exchanger selection, process interfaces and operating coordination. Each reference contributes to the surface engineering platform without implying that every application has the same capacity or energy yield.

Reference	Documented source	Engineering contribution
Hayat Kimya	Industrial flue gas	Operating energy record and host process integration
AFJET	Existing geothermal return water	Measured conversion at a defined temperature and flow
Pirelli Prometeon	Flash steam	Recovery within a production steam network
Borusan Mannesmann	Compressor cooling oil	Thermal transfer from a separate oil circuit

These references support surface ORC development. Integrated sealed AGS adds a further task: qualifying the underground collector as the sustained heat source. Reporting the two evidence layers separately gives the pilot programme a clear technical foundation and makes its next achievements measurable.

Sources: S16, S05

R. Rockefeller S.C.

RePG

Atmospheric Energy & Water Research

Experimental research platforms for electricity generation from atmospheric humidity and water production from air.



01 RESEARCH PLATFORM

Electricity from Atmospheric Humidity

Controlled airflow, humidity capture and experimental electrical-output validation.

02 RESEARCH PLATFORM

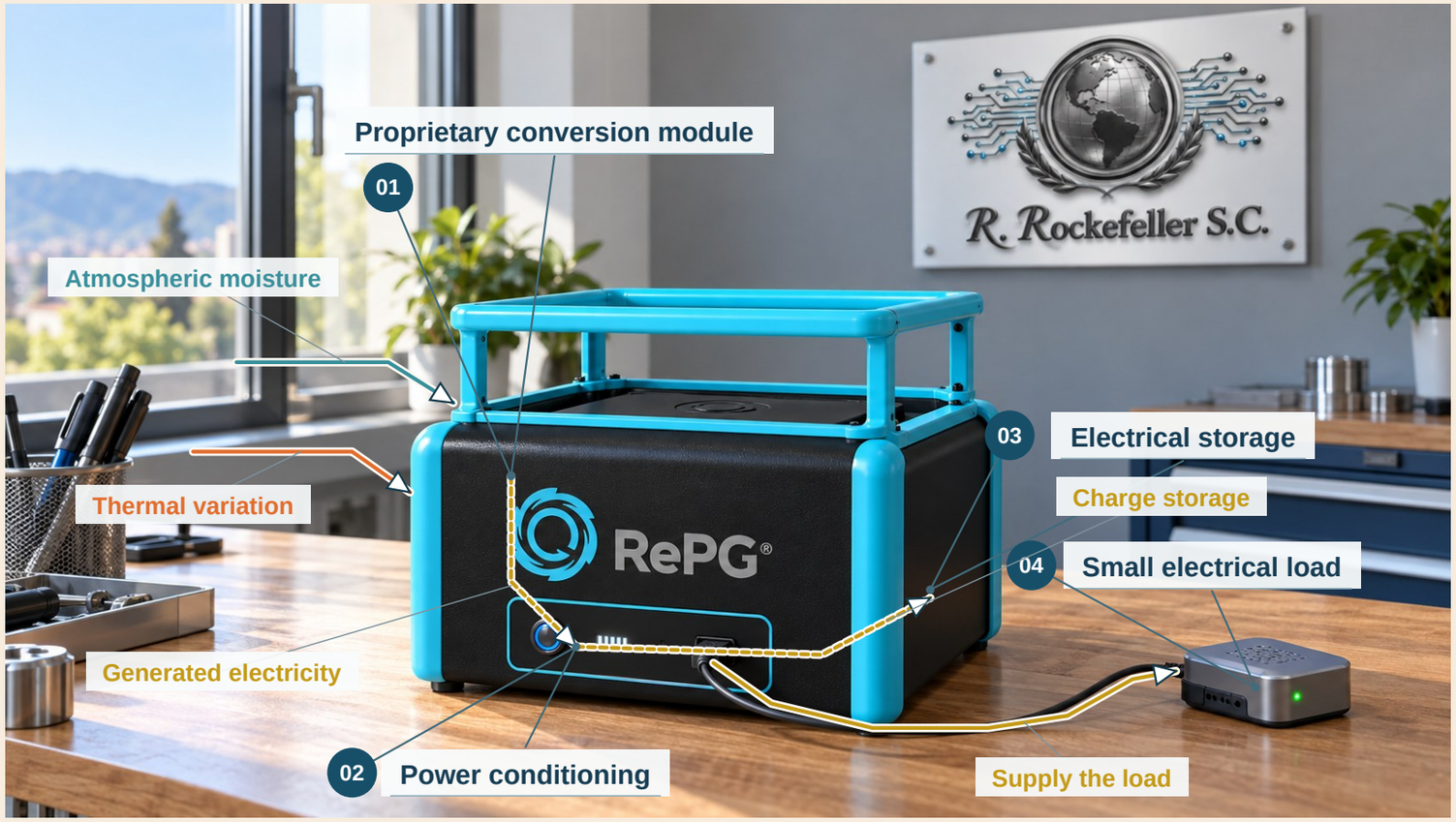
AQUA Atmospheric Water Generation

Air intake, refrigeration, condensation, water treatment and hygienic storage.

Electricity from atmospheric humidity

RePG’s humidity based development uses atmospheric moisture, available heat and differences in environmental conditions within a proprietary conversion process. Generation and storage support selected small electrical loads. This research family is distinct from industrial ORC equipment. Evaluation records generated energy, humidity, temperature and battery state over the intended operating period.

Atmospheric moisture Thermal variation Electricity



Functional interfaces inside the closed unit; internal geometry is not shown.

01 / Environmental exchange

Moisture and thermal conditions support the described process.

02 / Conversion control

The device coordinates moisture transfer and electrical generation.

03 / Energy storage

An internal battery accumulates electricity over time.

04 / Compatible load

Match daily demand and peak output to the device specification.



Original humidity technology hardware, Bursa.

D1, pp. 44 to 51. Manufacturer technology description and patent context.

Humidity based electricity for local services

RePG describes a proprietary technology that uses differences in atmospheric humidity and temperature to generate electricity. At Bursa, this technology family forms part of the development programme for distributed energy services, including portable equipment and selected electrical loads.

Understand the complete service chain

The functional sequence begins with environmental conditions at the device. The proprietary module performs conversion, the electrical interface conditions its output, and storage accumulates energy for later use. A compatible load draws from the available electrical supply. These interfaces explain the role of each component without reconstructing the confidential internal geometry or presenting a generic turbine diagram as the actual device.

Separate generation from storage

Electrical power, energy generated over time and battery capacity describe different functions. A battery can deliver a short period of higher demand even when generation is modest, provided sufficient energy has previously accumulated. Sustainable operation therefore depends on the daily energy balance and the required duty cycle. The appropriate application is selected from measured output under representative temperature and humidity conditions.

Evaluate the intended application

Potential uses include communications, monitoring, lighting and portable services where the device specification matches the load. A professional evaluation records environmental conditions, energy entering storage, energy delivered to the load and the change in battery state. This separates actual generation from an initially charged battery and establishes realistic service duration. Seasonal observations are especially valuable where the equipment will operate outdoors or away from the grid.

The performance record that matters

Quantity	Unit	What it establishes
Electrical output	W	Power available at a given time
Energy generated	Wh per day	Daily contribution to the load
Usable stored energy	Wh	Available operating reserve
Temperature and humidity	°C and % RH	Conditions behind the result

RePG's published description establishes the technology concept. Model specific measurements establish the service that each installation can deliver.

Sources: S23, S24

AquaWATT combines electricity and water

AquaWATT combines RePG's relative humidity technology with electrical output, water collection and internal storage. Its value is the coordination of local services in one product architecture. Electricity generated, battery capacity and daily water output remain separate quantities. Model specific evaluation establishes each output under the intended temperature, humidity and operating duration.

Ambient moisture · Temperature changes · Electricity · Collected water



Conceptual 3D process illustration. Native arrows identify the functional directions.

01 / Receive environmental inputs

Humidity and temperature differences provide the operating conditions.

02 / Manage conversion

The proprietary process coordinates the useful output paths.

03 / Collect water

Water follows its own collection and delivery route.

04 / Store and deliver electricity

The battery and electrical interface serve compatible loads.

D1, pp. 52 to 55. Declared AquaWATT product architecture.

AquaWATT: coordinated electricity and water

AquaWATT brings together the humidity based technology described by RePG, electrical delivery, water collection and internal storage. Its purpose is to coordinate useful local services in one product architecture, with separate electrical and water pathways.

Follow both output paths

Environmental humidity and thermal conditions provide the operating context for the proprietary conversion module. The electrical path connects conversion, power management, storage and the selected load. The water path connects collection, specified treatment and delivery. The illustration describes these functional relationships rather than the manufacturer’s confidential internal construction.

Match the product to daily demand

A practical application begins with two independent requirements: the electrical energy needed each day and the water volume required. Battery capacity supports the electrical duty cycle, while the reservoir supports the timing of water use. Neither storage figure represents the rate of new production. Simultaneous operation is assessed because service demand, environmental conditions and available stored resources vary throughout the day.

Plan a measurable local service

The product architecture can be assessed for small facilities, remote services and agricultural settings where its declared outputs match demand. Evaluation should record the electricity generated and delivered, water collected, relevant auxiliary consumption and the changes in both stores. Intended water use determines the required treatment, hygiene and quality verification. The result is a clear operating profile that shows what the selected model can provide in the intended location.

Two services, four separate quantities

Service	Production measure	Storage measure
Electrical supply	Net Wh generated per day	Usable battery capacity in Wh
Water supply	Usable litres collected per day	Available reservoir volume in litres
Environmental context	Temperature and humidity profile	Duration of representative testing
Delivered service	Actual electrical and water demand	Reserve at the end of the cycle

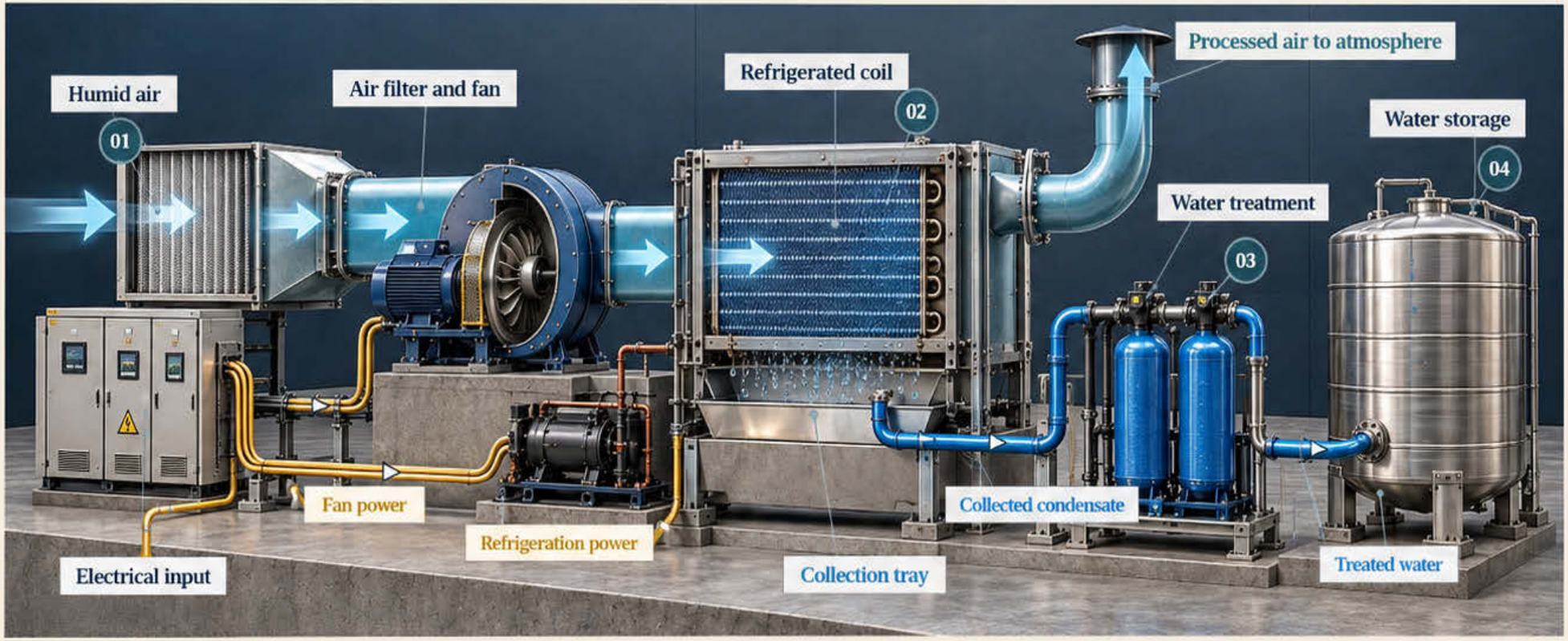
AquaWATT is evaluated as a combined service platform. AQUA, described next, is an atmospheric water generator that consumes electricity.

Sources: S25, S24

AQUA produces water from atmospheric moisture

AQUA uses electricity for refrigeration, airflow and supporting equipment. Production follows the local climate and selected model. At Ege Vitrifiye in Kemalpaşa, company documentation reports 1,000 litres per day rated capacity and a 400 litre daily annual average, associated with 17 °C and 60% relative humidity. Electricity is reported to come from compressor waste heat conversion.

Air Water Electricity



01 / Draw and filter air

A fan brings humid air through particle filtration.

02 / Condense moisture

Refrigeration cools the collection surface to form droplets.

03 / Collect and treat

A tray receives water before dedicated liquid filtration.

04 / Store for use

Treated water enters the tank; maintenance supports hygienic operation.

D1, pp. 56 to 57, 60 and 75. Manufacturer process and application data.

AQUA: turning atmospheric moisture into water

AQUA is an electrically powered atmospheric water generator. It draws humid air through the equipment, cools a collection surface to condense moisture, and directs the collected water through treatment and storage. Electricity is an input to this process.

Connect energy, air and water

Fans move air across the process surfaces while the refrigeration system removes heat to enable condensation. Collected droplets pass to the water circuit, which has its own treatment and storage arrangements. The electricity supply may come from the grid, an appropriate local generator or a designed renewable system. Where industrial waste heat conversion supplies electricity, the recovery unit and AQUA remain distinct parts of the overall installation.

Design around the actual climate

Water production changes with temperature, humidity and operating hours. Selecting a unit therefore requires a seasonal climate profile alongside daily water demand. The rated capacity identifies a defined operating point; the annual average describes a different measure of service. Storage helps coordinate production and consumption, while accessible filtration, cleaning and water quality checks support the intended use.

Read the documented application correctly

For Ege Vitrifiye in Kemalpaşa, the supplied company documentation reports a rated capacity of 1,000 litres per day and an annual average of 400 litres per day, associated with 17 °C and 60% relative humidity. Electricity is reported to come from compressor waste heat conversion. These application figures illustrate the importance of distinguishing nominal capacity from the water actually available over a year.

Ege Vitrifiye application, company reported

Parameter	Reported value	Meaning
Rated production	1,000 L/day	Declared equipment capacity
Annual daily average	400 L/day	Reported average water service
Associated conditions	17 °C; 60% RH	Environmental context
Electricity source	Compressor heat conversion	Power supplied to AQUA

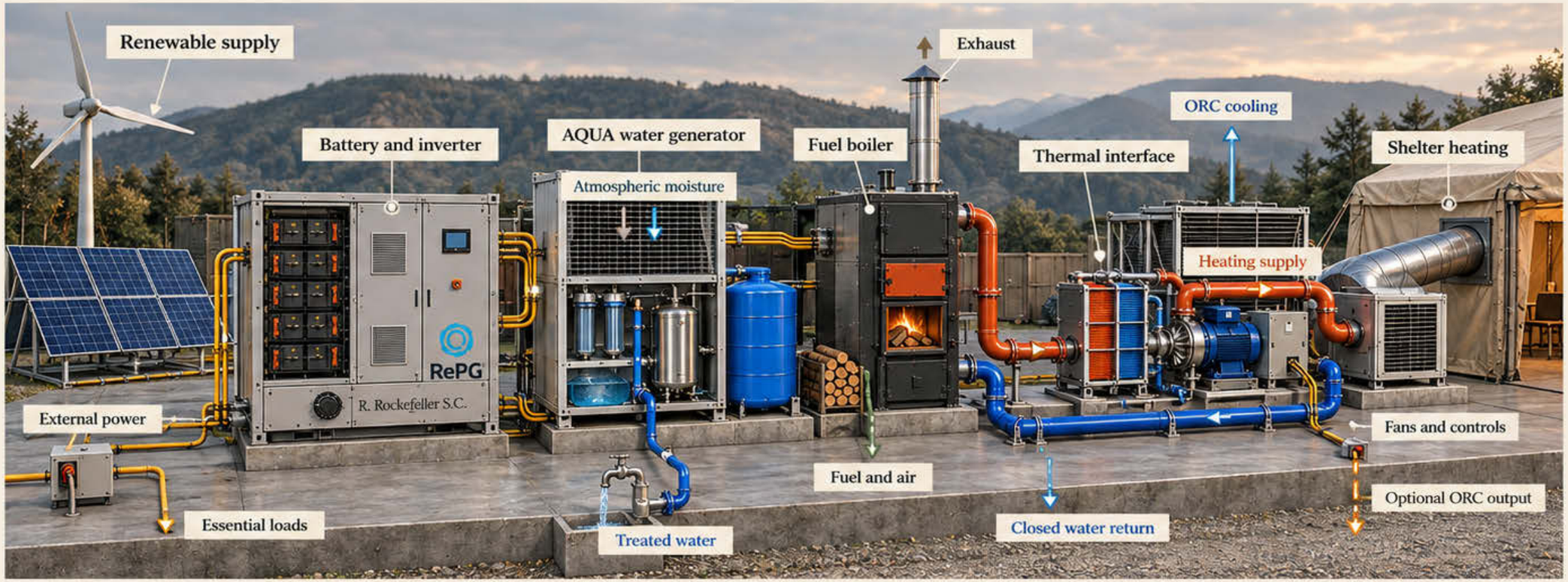
A robust performance statement records usable litres, electrical kWh and water quality together, so the complete service is visible.

Sources: S26, S27

Coordinated services in a deployable container

The emergency configuration coordinates electrical supply, storage, atmospheric water production and shelter heating. A separate fuelled thermal circuit supplies heat; suitable available heat can support ORC conversion. Deployment is sized around local resources and simultaneous demand. RePG reports field use at Hatay AKOM following the 2023 earthquake, while configuration development continues.

Electricity · Air · Water · Fuel and air · Heating supply · Cooled return · Exhaust



01 / Bring in energy

Solar, wind and external power provide the electrical inputs.

02 / Store and distribute

Batteries and an inverter support essential loads and equipment.

03 / Produce water

Electrically powered AQUA units collect, filter and store atmospheric moisture.

04 / Supply shelter heat

A fuelled water loop delivers heat and returns to its source.

D1, pp. 61 to 64. Declared configuration and company reported Hatay deployment.

A deployable platform for essential services

The deployable container coordinates electricity, storage, water production and heating around the resources available at the site and the needs of the people using them.

Build the electrical service first

Solar generation, wind generation and an external supply can contribute according to the selected configuration. The battery and inverter support distribution and the required operating reserve. Loads are prioritised so that communications, lighting, controls and essential equipment receive the intended service. The electrical plan includes the energy consumed by atmospheric water production, pumps, fans and supporting equipment.

Coordinate water and heating

An AQUA unit uses electricity to collect atmospheric moisture and deliver treated water to storage. Water output is matched to local temperature and humidity. A separate fuelled circuit supplies heating through a circulating water loop, with cooled water returning to the heat source. Where the available thermal conditions support it, an ORC module can contribute electricity. Fuel, exhaust and cooling requirements remain part of the complete operating arrangement.

Size the platform around the mission

Deployment planning considers simultaneous demand, available fuel, climate, service access and the duration of independent operation. Storage reduces interruptions but does not replace ongoing energy supply. Practical commissioning verifies the electrical distribution, water treatment, heating circuit and controls together. The supplied documentation reports RePG field use at Hatay AKOM after the 2023 earthquake, providing an application reference for continuing configuration development.

Define each service and its operating requirement

Service	Required resource	Delivery measure
Essential electricity	Generation and battery reserve	kWh per day and peak kW
Atmospheric water	Electricity and suitable air conditions	Usable litres per day
Shelter heating	Fuel and circulating thermal fluid	Useful heat and served demand
Continued operation	Replenishment and maintenance	Hours of supported service

The container is specified as an integrated set of services, with clear inputs and measured outputs for the intended deployment.

Sources: S28, S29

Automotive research and drone concepts

The research programme explores energy integration in mobile platforms, with application specific testing and a clear distinction between documented experiments and future concepts.



Oyak Renault: original research photograph

The supplied reference documents an experimental heat recovery application using motor cooling water. It lists 2 kW installed power, 1 kW net power and a temperature range from 85°C to 60°C.

Automotive thermal recovery

The study uses a vehicle heat source to evaluate a compact conversion system and its integration with the cooling circuit. The photograph shows the actual experimental arrangement.

Drone energy research

Drone applications are presented as an exploratory research direction. The work concerns power management, storage, mass and operating duration, with the intended electrical load defined before testing.

From concept to measured performance

Trials must record the energy source, useful output and storage balance. Vehicle propulsion and drone flight performance are not established by the laboratory illustration.

Automotive data: supplied RePG reference dossier. Drone: research concept, without an asserted flight demonstration.

Developing energy programmes with African partners

In parallel with the European pilot, RRSC is advancing project development and dialogue with government counterparts across Nigeria, Tunisia, Libya, Egypt, South Africa and the Republic of Congo. The objective is to build practical energy programmes around local priorities, suitable resources and the requirements of public and industrial users.

Technology matched to each country's priorities

The development work considers geothermal AGS, industrial heat recovery, energy efficiency and related infrastructure. Potential applications include industrial facilities, ports, digital infrastructure and other sites with continuous energy demand. Each opportunity begins with an identified user, a technical resource assessment and a clear understanding of the service the project needs to deliver.

The cooperation with 751 Africa

RRSC works with 751 Earth Ltd through 751 Africa and the 751.Earth Family Group, represented by Dr. Karen Sumser-Lupson. The cooperation combines RRSC's engineering and technology capabilities with programme origination, institutional relations, climate finance preparation, governance and impact evaluation.

Partner or institution	Work being developed
751 Africa	Shape country programmes and connect engineering concepts with institutional and climate finance requirements.
Green Climate Fund	Seek collaboration on climate aligned proposals, appropriate implementation pathways and measurable development outcomes.
World Bank Group	Explore suitable project preparation, development finance and institutional cooperation pathways.
Government and local partners	Define priorities, project users, responsibilities, permissions and the local delivery framework.

These initiatives are in preparation and institutional development. The next step is to turn suitable opportunities into documented projects with an agreed technical scope, measurable benefits and a financing structure assessed by the relevant institutions.

Sources: S35, S36, S37



therockefeller-sct.com