



AI-Adaptive, Manufacturable MOF Adsorber Cartridges for Industrial Dehumidification and Water Harvesting

Presented by:
Ibrahim Albaiik
Co-Founder & CTO
NovNat Tech (Trading as Aqueris)





ORGANISATION PROFILE

Aqueris (formerly NovNat Tech) is a UK technology company developing advanced metal-organic framework (MOF) materials and systems for atmospheric water harvesting, industrial dehumidification and drying. We combine materials innovation, engineering and scalable manufacturing to deliver energy-efficient solutions powered by low-grade heat, working with international partners to advance from R&D to industrial deployment.

Founded in **April 2022**

Team: 8 full-time employees and 3 contractors.

Funding: Approximately €2.9 million raised; completed a pre-seed round of over €870,000, backed by Creator Fund, MENA+ and Wamda.

Industrial partnership: €580,000 Joint Development Agreement with one of Europe's largest HVAC OEMs.

Intellectual property: Two patent applications pending, covering MOF materials and system design.

EUROGIA: Successfully completed an adsorption heat pump project for cooling (**2024–June 2026**).

SMART Advanced Manufacturing: Ongoing project with two Turkish partners and one UK partner, scheduled for completion in **early 2027**.

Our Technology (1)



aqueris | The Architects of Nano Water Control

On the way to Türkiye

Our pilot container is heading to Kizildere 2 Geothermal Plant for a 3-month trial.

Turning air into opportunity, together.



aeris-28[®]
High-performance MOF



Capture



Use low-grade heat



Enable



Build

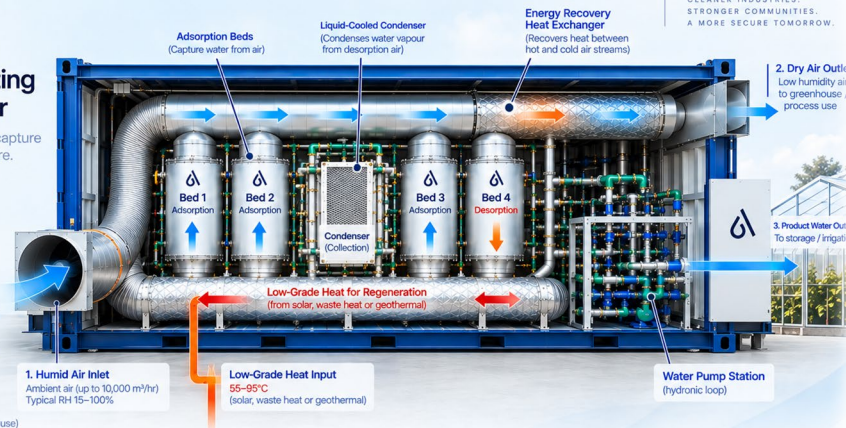
CLEANER INDUSTRIES.
STRONGER COMMUNITIES.
A MORE SECURE TOMORROW.

aqueris | THE ARCHITECTS OF NANO WATER CONTROL

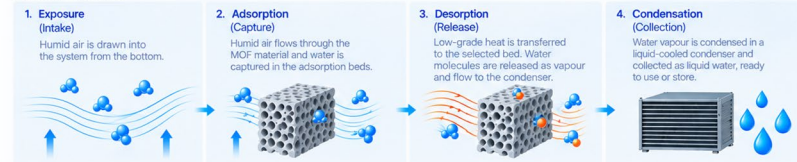
Atmospheric Water Harvesting Pilot Container

Clean, low-energy water capture for a climate-resilient future.

- Air flow rate**
Up to 10,000 m³/hr
- Water output**
To storage / irrigation
- Low-grade heat input**
55–95°C (solar, waste heat or geothermal)
- 4-bed cyclic system**
3 adsorption + 1 desorption
Continuous operation
- Application**
Water production and dry-air delivery (e.g. greenhouse)



How it works



Two valuable outputs

- Product water**
To storage / irrigation
- Dry air**
Low humidity air to greenhouse / process use

TURNING AIR INTO OPPORTUNITY

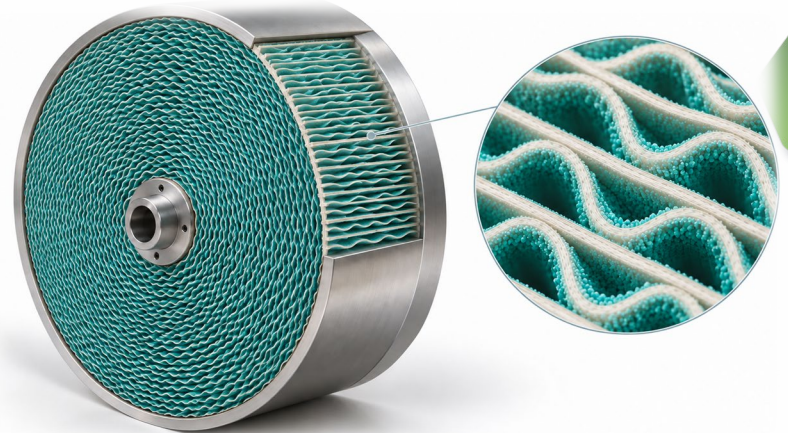
OUR MOF – Based Atmospheric Water Harvesting system – 500L/day of water, 10,000 m³/day of dry air (TRL 6)

Our Technology (2)

MOF INK SOLUTION (Aeris-18 and 28)



Coated HEATEXCHANGER with MOF



Coated GLASS FIBRE SHEET with MOF

targeting up to 50% lower energy consumption for dehumidification.

Key applications:

- ✓ Battery manufacturing and dry rooms
- ✓ Pharmaceutical manufacturing
- ✓ Food processing and drying
- ✓ Cold storage and warehousing
- ✓ Commercial and industrial HVAC

PROPOSAL INTRODUCTION (I)

Vision: To lead the world in pioneering MOF-enabled solutions for water harvesting and climate resilience

Motivation:

1. Industrial humidity control carries a substantial energy cost, with dry-room operation accounting for around 43% of battery-production energy in a cited industry example. AI-MAC targets a 50% reduction in dehumidification energy, helping manufacturers lower operating costs through advanced MOF materials and waste-heat utilisation.
2. Data centres require reliable cooling and can consume substantial water while releasing heat. AI-MAC aims to use suitable waste heat to produce water from air, providing a supplementary supply for cooling and reducing reliance on local freshwater resources.

Content: AI-MAC will develop manufacturable MOF adsorber cartridges with advanced heat exchangers and AI-adaptive controls, using low-grade waste heat for industrial dehumidification and water harvesting.

PROPOSAL INTRODUCTION (II)

Expected outcome:

Demonstrate water production of 1,500 litres/day using waste heat as the sole thermal energy source, alongside dry-air delivery of up to 20,000 m³/hour. Achieve TRL 7, developing the adsorber cartridge manufacturing process and AI-driven system control.

Impacts:

Reducing dehumidification energy consumption by 50% by replacing conventional sorbent-based systems with advanced MOF technology.

Schedule: We're ready to start now, project lasts 18 months



PARTNERS

Partner search:

1. Coating and manufacturing partners to develop scalable spray and electrostatic coating processes for applying our MOF slurry to newly designed heat exchangers within our adsorber cartridges.

2. HVAC OEMs and system integrators to co-develop and integrate the cartridges with AI-driven controls into industrial systems.

3. End users and pilot partners, working alongside OEMs, to demonstrate the technology in data centres, battery manufacturing dry rooms, pharmaceutical facilities and food processing.



CONTACT INFO

Contact info: Ibrahim Albaik, Email Address: i.albaik@aquaris.co.uk

Ibrahim Albaik

Co-founder and Chief Technology
Officer at Aquaris | PhD in Mechanica...





www.smarteureka.com