OCP Cooling Environment/Heat Reuse - May 2023

QScale

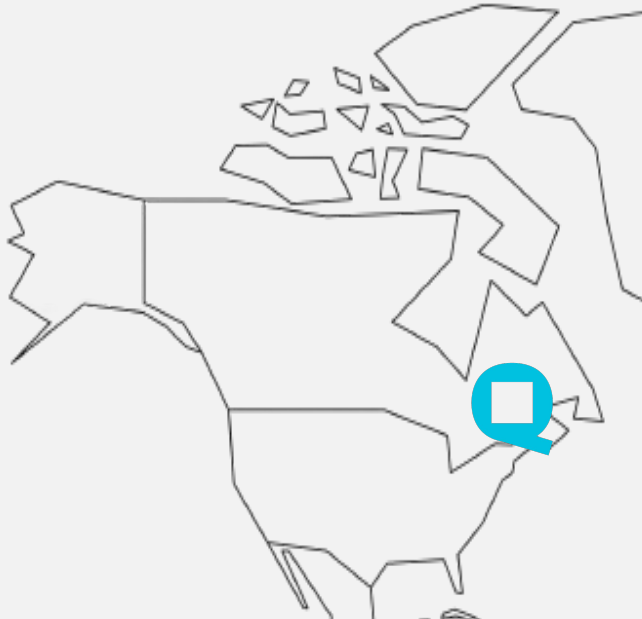
Breaking down the barriers - A discussion on overcoming heat reuse challenges in Canada

QScale

- Founded in 2018
- Headquartered in the Quebec City Area, Canada
- We develop sustainable supercomputing colocation centers

HELLO, I'M VINCENT THIBAULT

Co-Founder and Executive VP,
Strategy & ESG @ QScale



Our mission

Powering the HPC and AI Revolution with Clean Energy

The obvious and mandatory key success factors

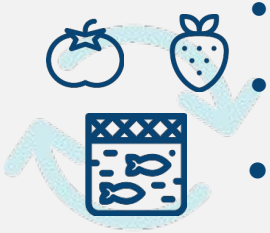
The Key Success Factors for Our Purpose-Built Heat Reuse Facility in Canada

Liquid cooling and heat reuse engineering

- Our facility is built to support all **liquid cooling** technologies
- Heat recovery was considered as of **day 1** of the design

Strong partnerships

- We have struck a partnership with a local **gas supplier committed to make their distribution network greener**
- we **started working with local farming experts before the built** was even started



Prime location

- We are located in Canada, a **nordic country!**
- We have **secured 100 hectares of farmland** right next to the facility
- There is a large existing farm (40+ hectares) across the highway

Generous incentives

- QScale is **giving away its heat**
- At this moment, the Quebec Ministry of Environment & Fight Against Climate Change provides **grants up to 75%** of the cost related to feasibility and construction of heat reuse projects.

Fall 2022 - Aerial View of the Campus, Phase 1 under Construction

Photo Credit : QScale

Fall 2022 - View from QScale Rooftop on the Greenhouses Located Across the Highway

Photo Credit : PECKHAM, OLIVER - HPC WIRE

Spring 2023 - QScale Facility Purposely Designed for Liquid Cooling

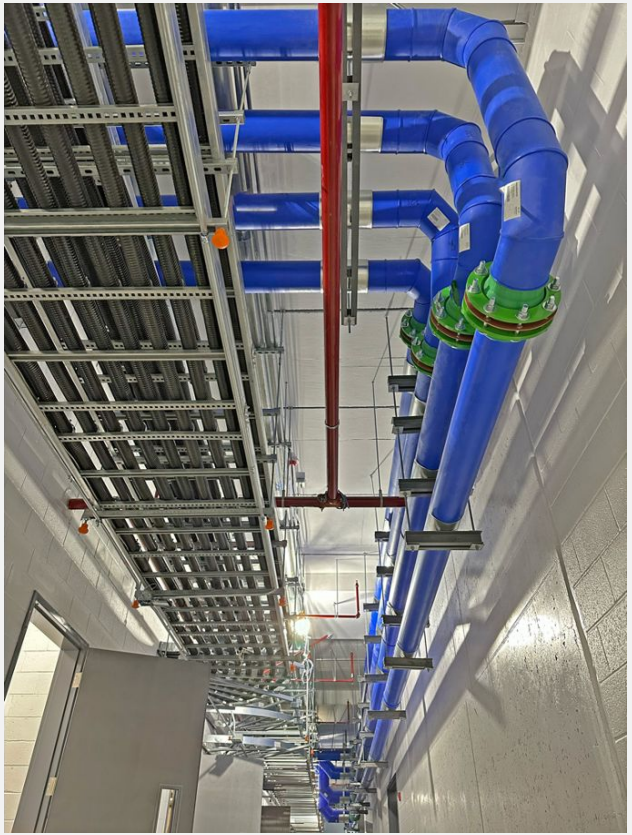


Photo Credit : QScale

Spring 2023 - QScale Facility Purposely Designed for Liquid Cooling

QScale, Énergir partner to recover heat at Quebec data centres

Waste QScale Quebec City Mar. 23 2023

Nicholas Sokic
Business reporter

SustainableBiz

QScale, a designer and developer of environmentally friendly high-performance computing facilities, has partnered with Énergir Development to maximize waste heat recovery at the Q01 Campus being built in Lévis, Que.

Phases 1 and 2 of QScale's Q01 Campus under construction. (Courtesy QScale)

When its eight phases are complete over the next five or six years, QScale's Q01 Campus will represent 96 megawatts of IT capacity across almost a million square feet of building space, powered by Quebec's largely clean grid.

Énergir is the largest natural gas distribution company in Quebec and is also the largest electricity distributor and the sole natural gas distributor in Vermont. Elsewhere in the U.S. it generates energy from hydroelectric, wind and solar sources.

QScale | énergir Development

QScale and Energir Development Join Forces to Drive Decarbonization in Quebec Through Waste Heat Recovery

March 16, 2023 12:00 ET | Source: Énergir Follow

LEVIS, Quebec, March 16, 2023 (GLOBE NEWSWIRE) -- QScale, a Québec company that develops environmentally responsible computing centers, and Énergir Development, hereinafter "Énergir," a diversified energy company, announce a collaboration to maximize waste heat recovery in Québec.

QScale and Énergir are taking real steps towards decarbonizing Québec by combining their expertise in recovering and optimizing the use of heat generated by computing centers. As part of this collaboration, QScale will provide free waste heat from its centers. Having carried out pre-feasibility studies and confirmed technical and economic viability, Énergir will ensure project implementation from design through to operation.

GlobeNewswire

The challenges that remains

The roadblocks in North America's clean energy efficiency puzzle !

Incompatibility with Existing Infrastructure

- **Retrofitting existing buildings**, industrial or residential districts is expensive and time-consuming.
- Keeping in mind that **they need to add heat reuse on top** of electrical and gas entrance.

Knowledge Gaps

- Many building owners, operators, and policymakers are **unaware of the benefits** and global potential of heat recovery.
- **Low heat is a challenge for users** that don't have the knowledge of proper staff to operate such systems

Low Energy Price

- The very **low price of renewable energy** in Quebec (4 ¢ USD/kWh) makes it difficult for heat recovery projects to compete (despite the fact that we are giving away the heat and the 75% Governement grant.

And lots of others

- Low population density and large distances in Canada is a challenge for heat reuse district;
- etc.

Discussion

What specific roles and strategies can the **digital infrastructure industry** play to promote clean energy efficiency?

*According to Gartner, without sustainable practice, **AI** will consume **more energy than the human workforce** by 2025*

What are countries in Europe working on?

Source : Ramboll

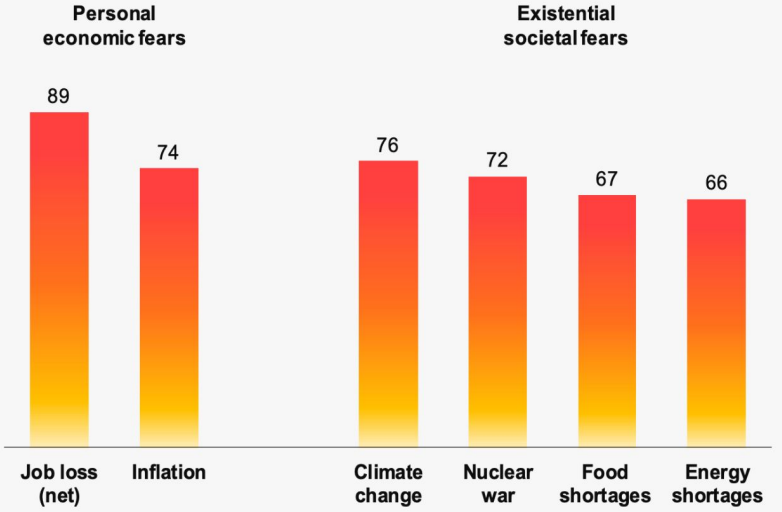
	Denmark	Norway	Netherlands	Germany
Regulatory initiatives and proposals	Removal of tax on excess heat New price regulation on excess heat	Requirement for planned data centres above 2 MW to assess the potential to utilize excess heat	Data centres must explore the use of excess heat for heating nearby homes	Draft of the Energy Efficiency Act: Mandatory reuse of 30% and (later) 40%
Political focus on excess heat				
Proposed DC heat recovery regulation				
Example of excess heat recovery	Meta's data centre in Odense is suppling excess heat to 7,000 households	Excess heat recovery in Hitra Seafood's trout farm (world's largest trout farm)	NorthC data centre south of Amsterdam	Pilot project on excess heat recovery in Frankfurt to supply 1,300 apartments

Discussion

How can we **collaborate and influence** stakeholders **outside of our industry** to drive meaningful change?

Excess heat *is the* ***world's biggest*** *untapped* ***energy source****, according to experts from World Economic Forum*

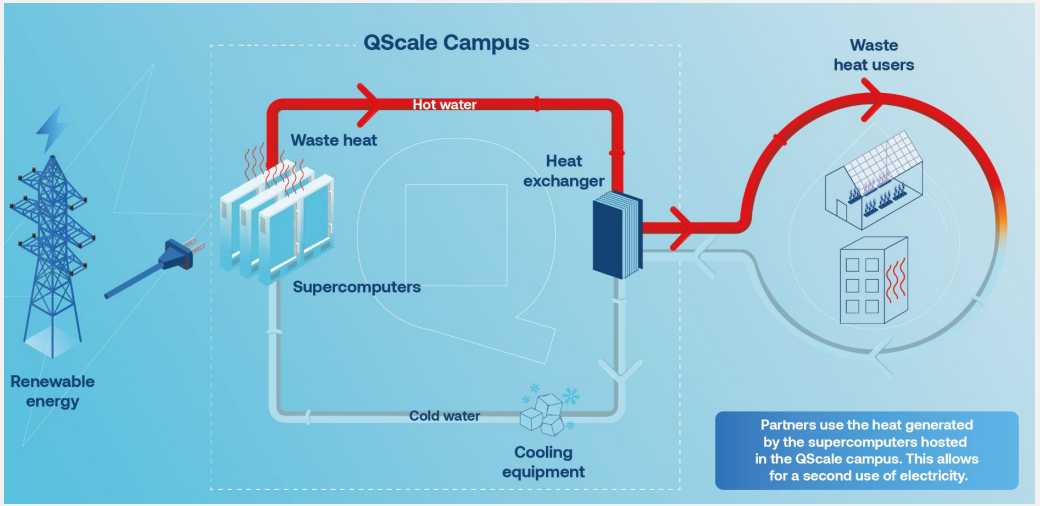
According to the 2023 Edelman Trust Barometer, ***2 of the top 4 existential worldwide social fears*** *are linked to Climate change and Energy Shortages*



Ideas to make it work

Broadening Our Horizons : Heat Reuse as a Global Solution to Clean Energy Challenges

- Digital infrastructure should **lead by example** and influence other industries in **unlocking** the potential of **using clean energy twice.**
- To achieve full potential, it's necessary to **prioritize development in suitable locations** where excess heat can be valued
- It's also crucial to **mobilize a larger ecosystem** of stakeholders (beyond heat producers) and consider long-term economics.



Source : QScale, Recovery of Waste Heat

Conclusion

- I believe in a future where **digital infrastructure** industry is recognized as a **leading positive force for our planet**.
- I envision our industry being at the forefront of innovation in reducing energy waste and **increasing access to clean energy**.
- To achieve this objective we need to foster a **culture of collaboration** within our industry, from builders to suppliers to end-users and outside of it, to **push the boundaries** of what is possible and **inspired others** to do things better.