

OPEN POSSIBILITIES.

Moving Carbon Action And Accounting Upstream

Ali Fenn, President ITRenew

Lars Schedin, Co-Founder and Senior Advisor of EcoDataCenter

Daniel Pope, Co-Founder and CEO of Submer

Jacob Boström, CEO @ Green AI Cloud



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Sustainability Challenge of Data centers: Explosion of Capacity and Infrastructure

104

GW and
growing!

75%

2x; 5M
at the edge

175

Zettabytes

45%

of total H₂O

1:3K

Device data
explosion

1B+

Up from
10M



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Sustainability Implications Demand New Approaches

Renewable progress is
great, and necessary,
but **INSUFFICIENT**



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Understanding Scope 3

Supply chain carbon



vs. operating footprint

Construction



Of WW energy use
(= Your scope 3)

Pre-use Phase represents



of IT hardware carbon



Circularity is an Essential Path to Net Zero



Supply chain manufacturing that can be made net zero carbon should be



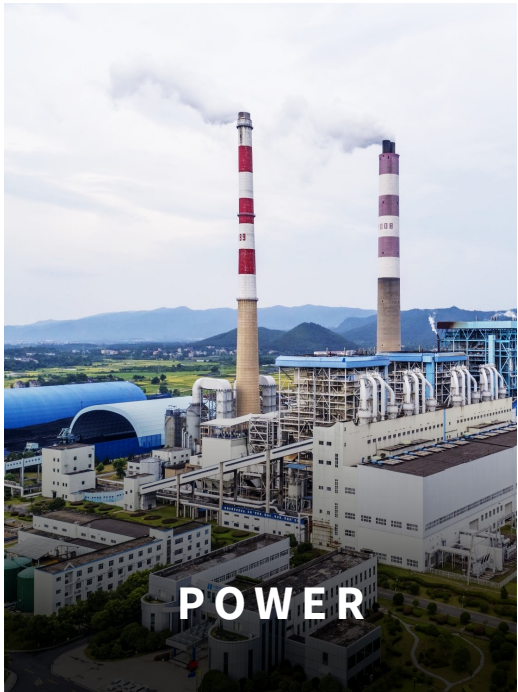
Optimize renewable energy and operations



Next frontier: circularity that regenerates ecosystems



Framework for a Climate Positive Data Center



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Data Center in an Ecosystem

Lars Schedin, Co-Founder and Senior Advisor of EcoDataCenter



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Construction and Installations



Full construction, incl walls and roof, in laminated wood



It takes Swedish forest two minutes to reproduce the wood used for a 6 MW data center



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Renewable power ≠ Climate Neutral



There are no climate neutral power. Even renewable power comes with embedded CO₂



Hydro power comes with 9 grams per kWh



Wind power comes with 12 grams per kWh



Distribution losses should also be considered



Re-using the Heat



When heat is not needed into the district heating system, we are producing pellets



1 MWh generates energy value of 4,3 MWh in pellets



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CO₂ Calculation Summary

Scope	Green House Gas Protocol			GHGP Total	Avoided Emissions	Total
	I	II	III			
Land	-	-	0,0	0,0	-	0,0
Building	-	-	0,1	0,1	-	0,1
Tech installations	-	-	1,1	1,1	-	1,1
Operations	1,3	-	0,9	2,2	-	2,2
Power	-	0,0	10,5	10,5	-	10,5
Heat re-usage	1,7	-	-	1,7	-48,9	47,2
Total	3,0	0,0	12,6	15,6	-48,9	-33,2



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Circular IT Solutions Opportunity

Ali Fenn, President of ITRenew



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Renewable Progress is Strong, But Are We Looking at the Whole Picture?



CO2e and GHG from mining to manufacturing to deployment

Embodied Energy/ Scope 3 emissions



Electricity to run IT equipment

Scope 1 emissions



Recycling and EOL Processes

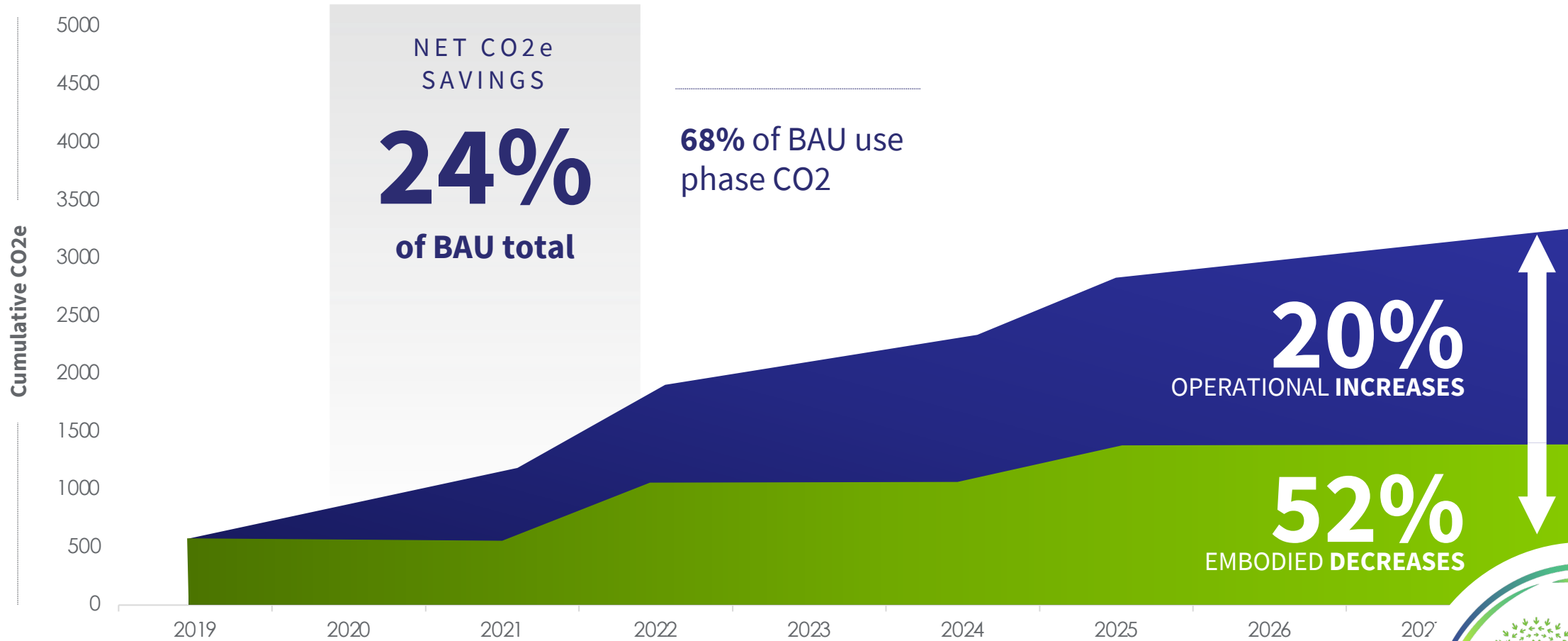
Embodied Energy/Scope 3 emissions



What If We Could Enable a 2nd “Life”?

Pre-use ●
Use ●

CE SCENARIO



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We Have: Sesame by ITRenew

1st line of recertified, warrantied, no compromise open hardware compute and storage solutions

**Rack systems
designed for
your workload**

Cloud Native/Kubernetes
AI/ML, HCI, Edge



Hyperscale-grade performance,
efficiency and scalability

- 50% Lower TCO
- 4x Faster Time-to-Value
- Eliminates 75% Pre-use Phase Carbon Emissions
- Massive Scale
- Circular Economy Driven
- Open Hardware Based



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ITRenew + EcoDataCenter Carbon Impact

CO_{2eq} Calculation

Emissions per kWh	Green House Gas Protocol			Avoided Emissions		Total	
	I	II	III	IV			
Scope							Emission rights created <ul style="list-style-type: none"> • 1,000 kW IT-load • PUE 1,10 • Yearly power consumption 9,636 MWh • Emission right created 1,091 tones CO_{2eq}
Land	-	-	0,0	-	0,0		
Building	-	-	0,1	-	0,1		
Tech installations	-	-	1,1	-	1,1		
Operations	1,3	-	0,9	-	2,2		
Power	-	0,0	10,5	-	10,5		
Heat re-usage	-	-	1,7	-48,9	47,2		
Total	1,3	0,0	12,6	-48,9	-33,2		
Server circulation	-	-	-	-80,0	-80,0		
Total Offering	1,3	0,0	12,6	-128,9	-113,2		



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Cooling Challenges and Opportunities of Immersion

Daniel Pope, Co-Founder and CEO of Submer



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What is the Planet Trying to Say?

Consumption & emissions 2020

500 BILLION

kW Hours

of electricity expended.

354 MILLION

METRIC TONS

Of Carbon Dioxide CO₂.

Equivalent of 76 million cars!



Energy consumption

98%

of the energy consumed by a datacenter is rejected in the form of heat into the atmosphere.

There's a massive opportunity-cost by not re-using it.

Traditional air cooling technology only allows to capture <5% in the form of low-grade heat (max 25 °C supply).



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Why Now?



Heat Reuse is **inevitable**



98% energy rejected as **waste**



70C Immersion can deliver without heat pumps



44M€/year Potential Income (100mW DC)



<5% Captured by a **traditional DC**



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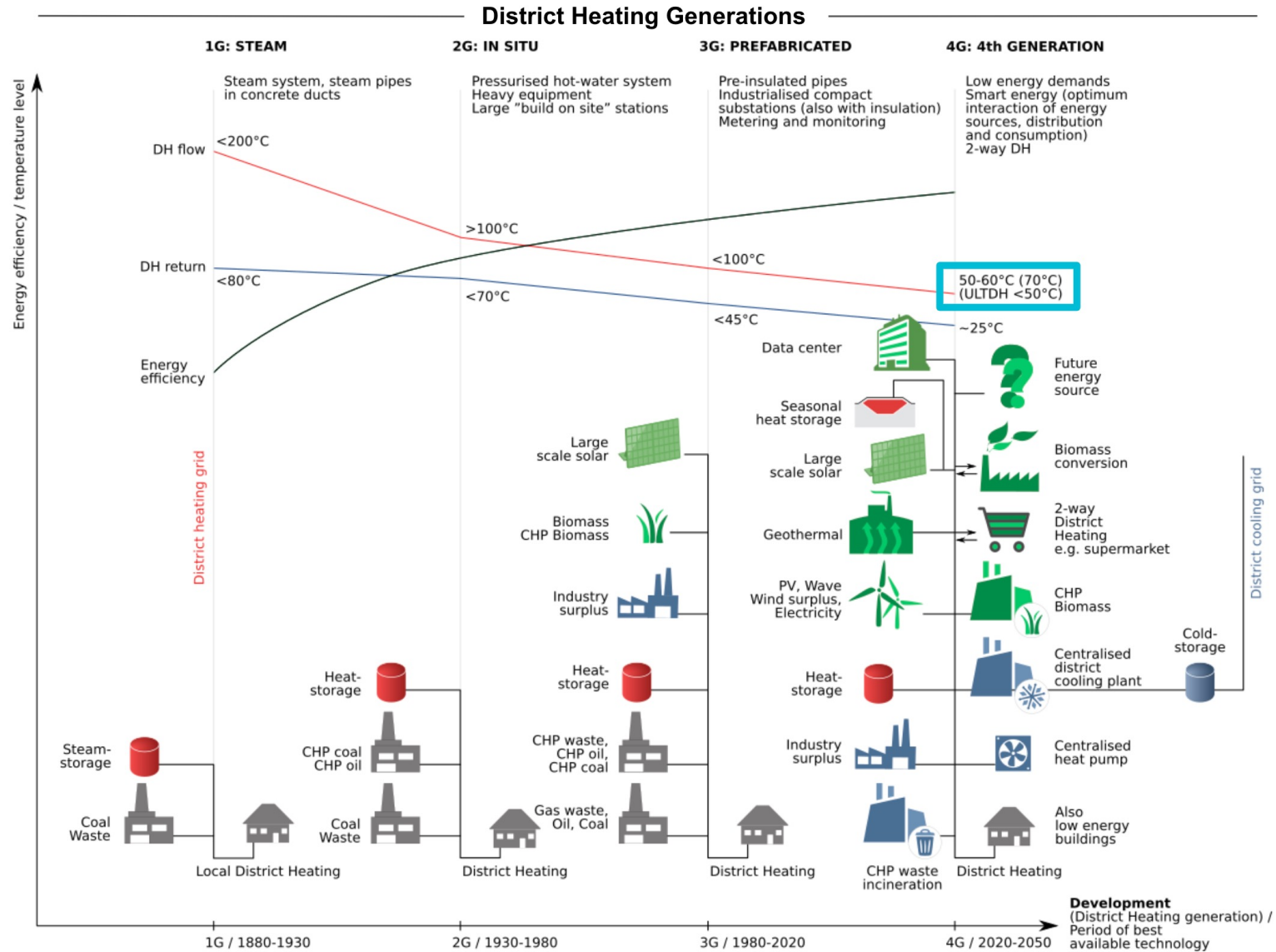
 **ITRENEW**



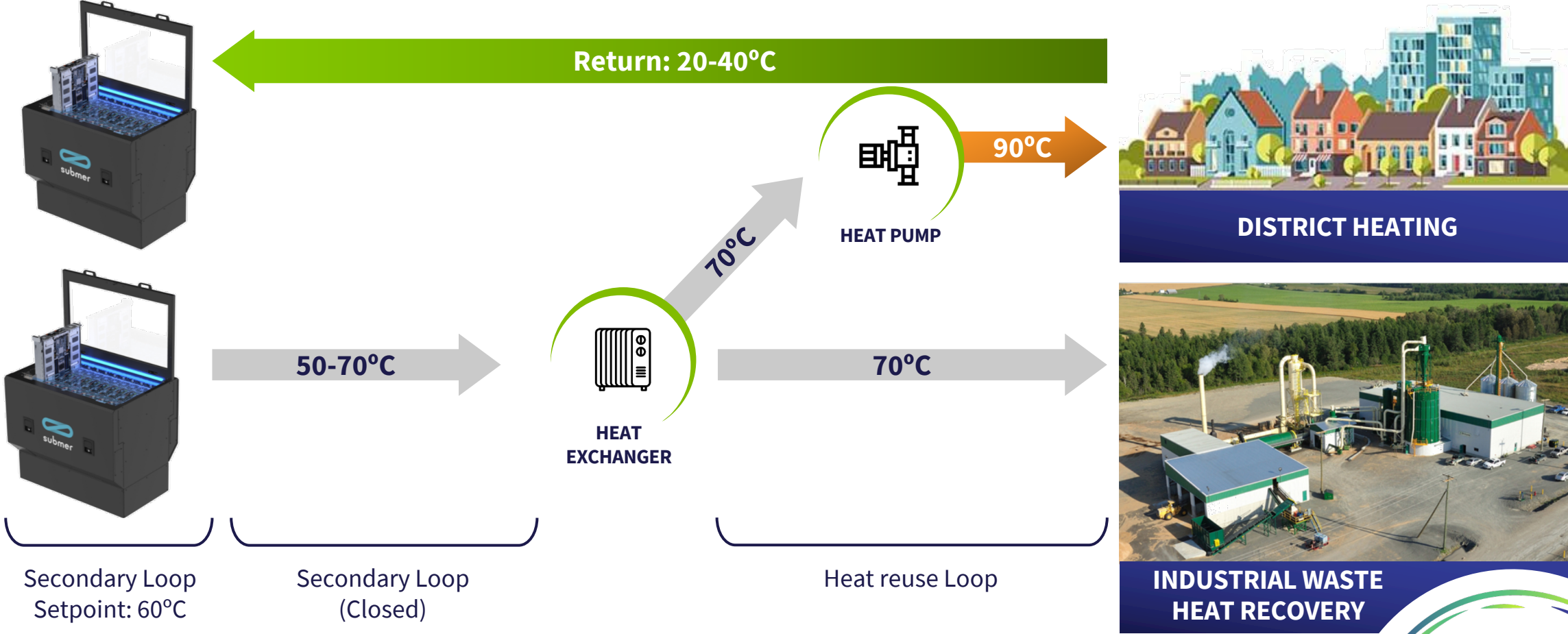
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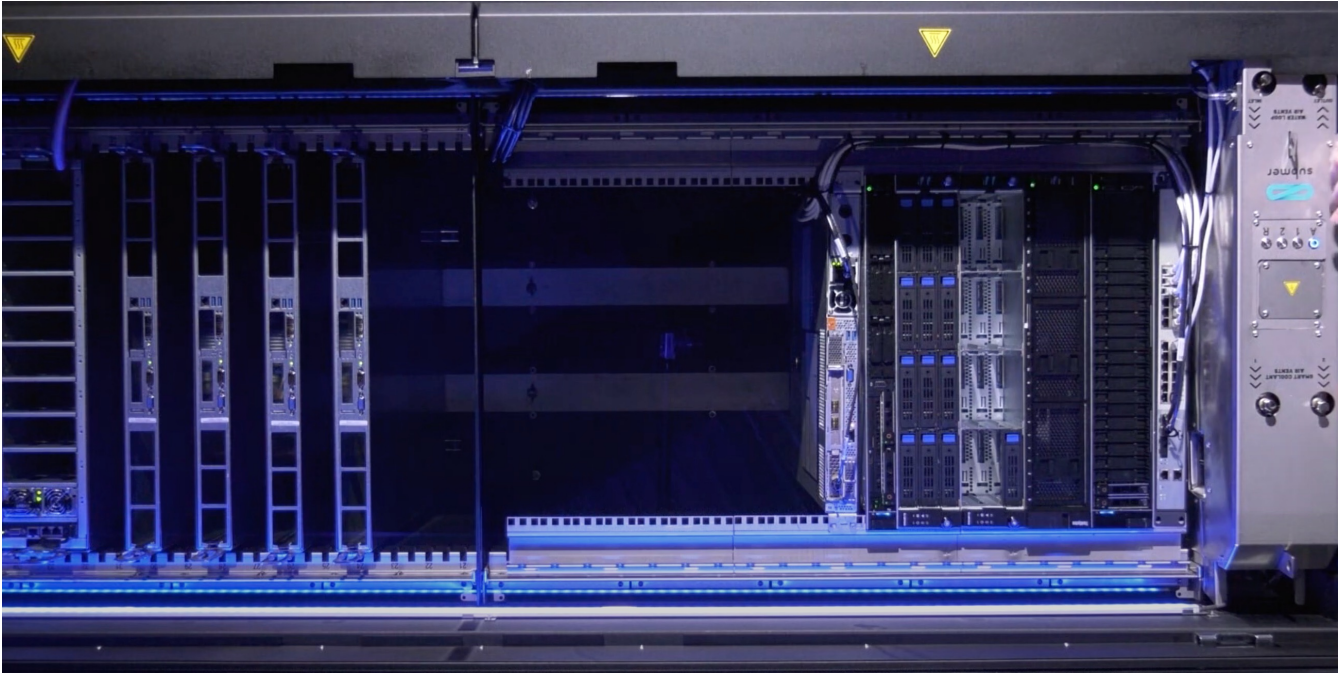
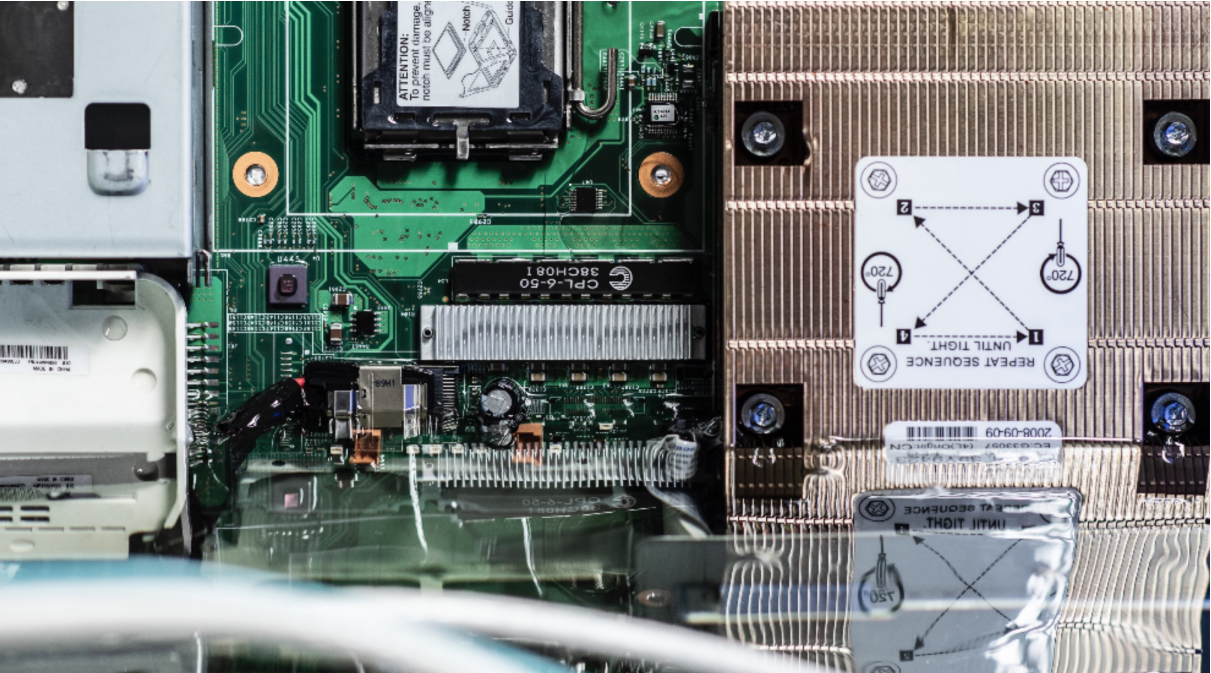
Why Now?



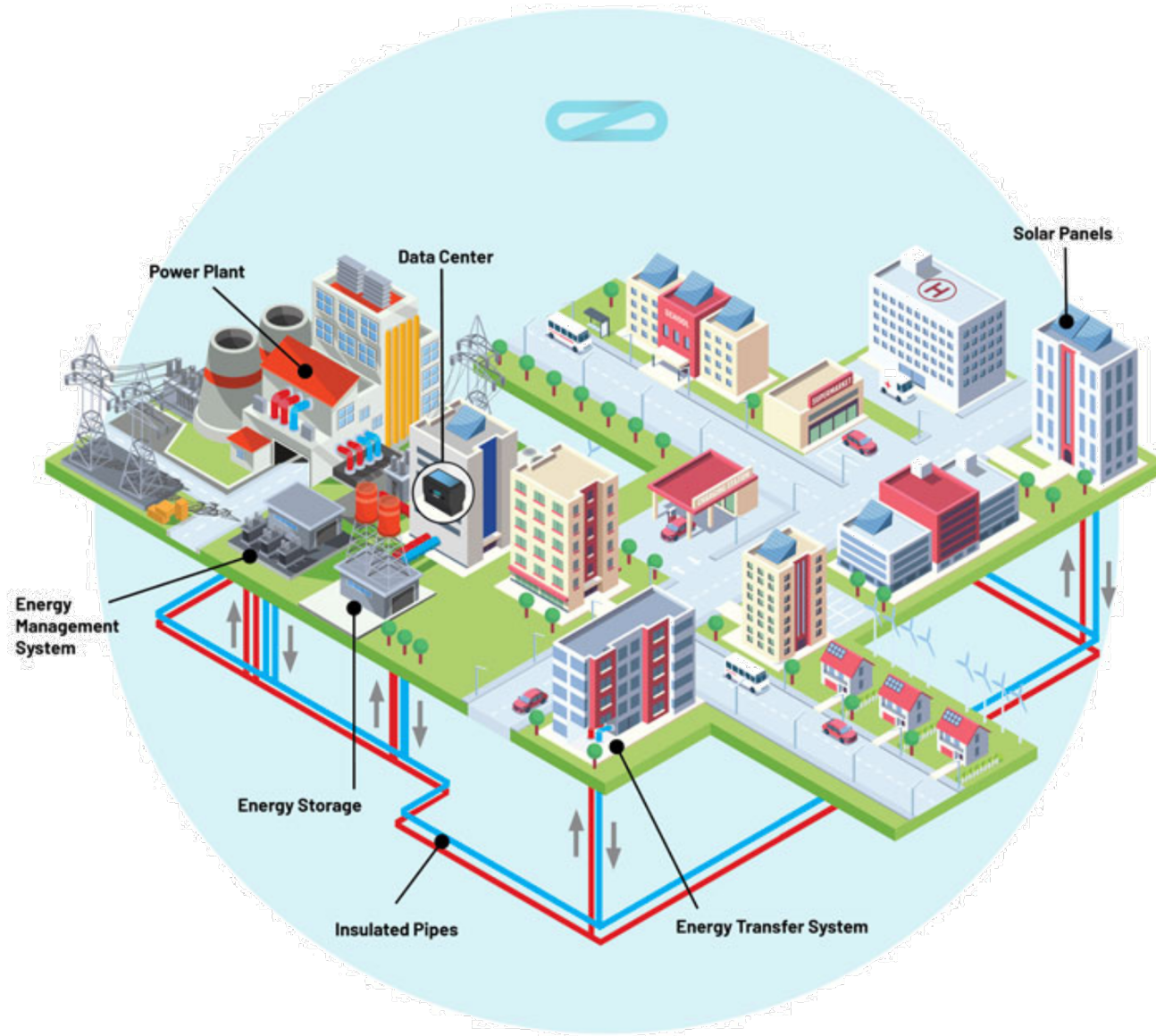
Climate-positive Data Centers Through Reuse of Heat



How? With Immersion Cooling



Towards a Circular Economy



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The Enabler of Sustainable Hyperscale AI

Jacob Boström, CEO @ Green AI Cloud



GREEN AI CLOUD

A SWEDISH CLOUD COMPUTE SERVICE FOR AI



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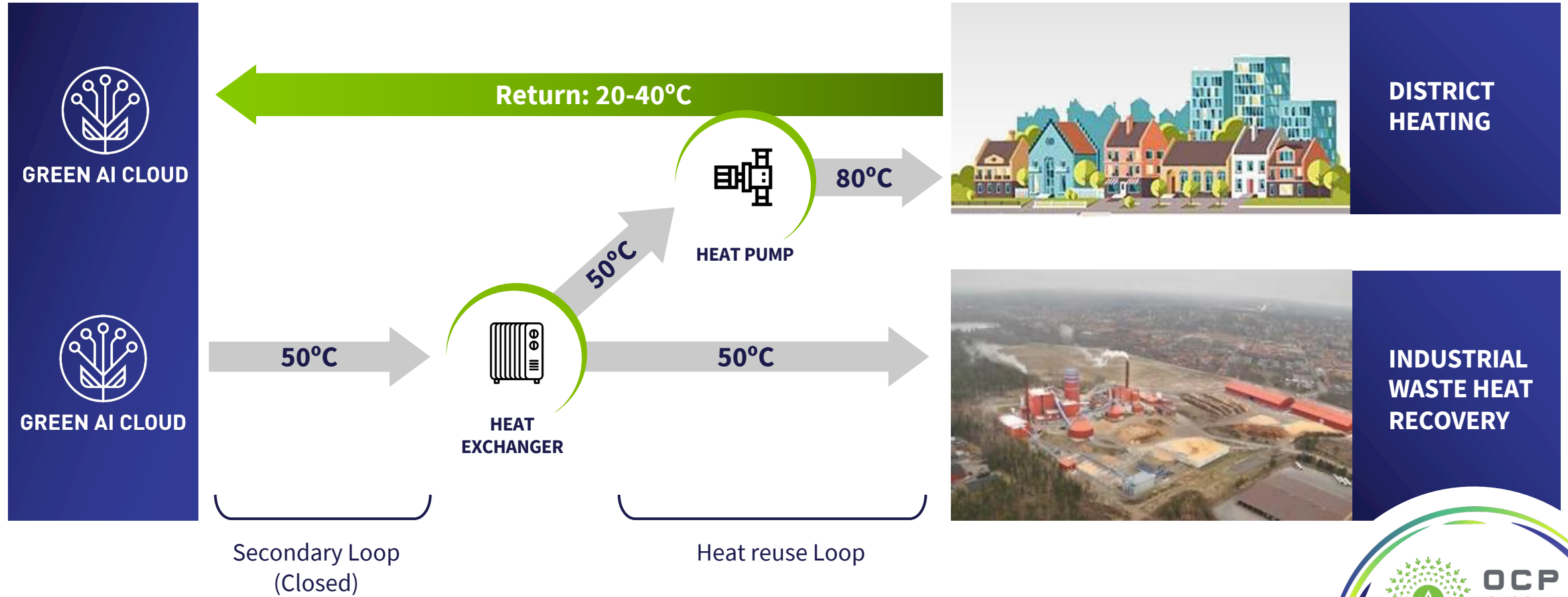
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Main Site

Climate Positive Cloud Compute



DATA CENTER FACILITIES



ESG

Certificate System



GREEN AI CLOUD

Green AI Cloud is monitoring the actual CO2 footprint per customer – in line with the official Greenhouse Gas Protocol guidelines.

Every year Green AI will distribute each customer’s actual “CO2” footprint as an environmental dividend in the form of an official certificate that each customer can use in their own annual report or equivalent as proof.

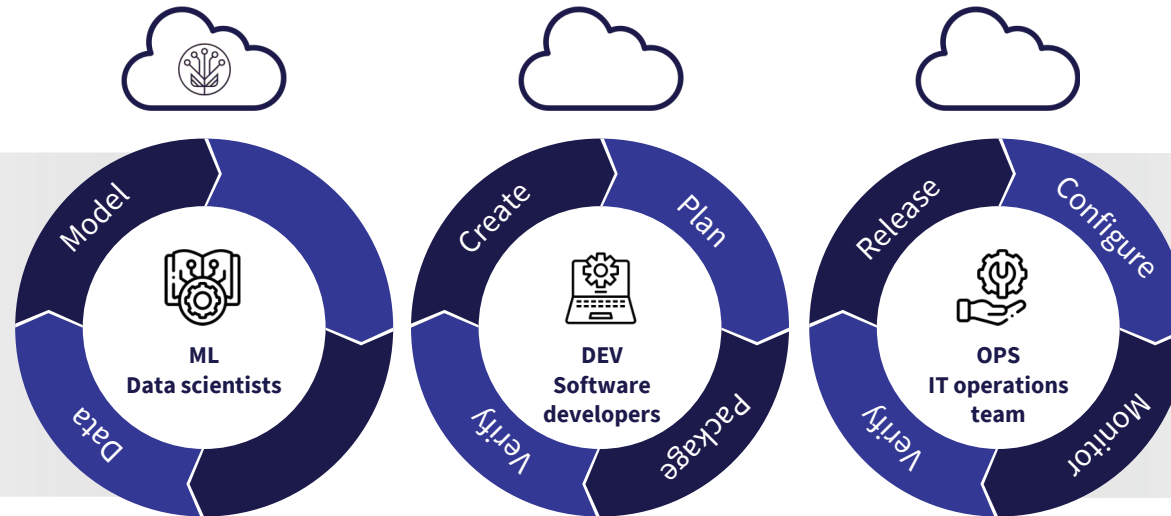


Sustainable High-performance Compute – A Nordic Solution

Helping corporates with AI computation through the cloud

Machine Learning Layered On Devops

Green AI's solution solved in five steps by **combining machine learning, applications development and IT operations**



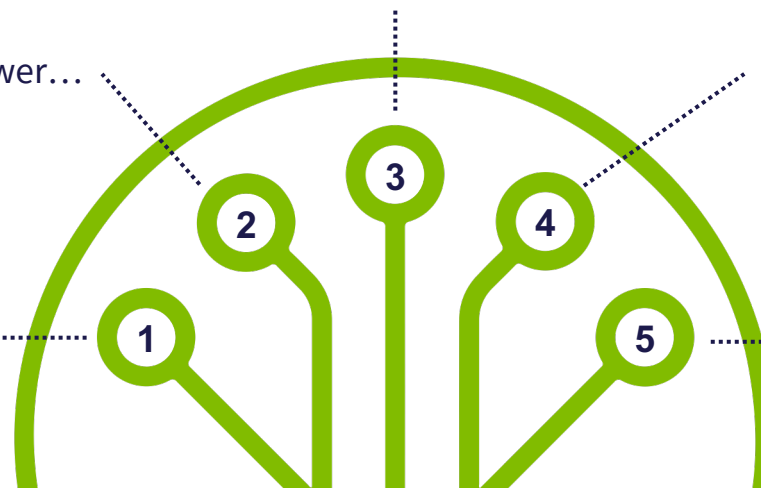
...Log onto Green AI's cloud service

...But lack processing power...

...Process model in the cloud...

Corporates own their AI models...

...Get quick results



Green AI Cloud Summary



Integrated Circular Hardware Software Ecosystem
Climate positive Cloud Compute



Only renewable energy sources
Emission-free



Excess heat used in nearby industries
CO2 negative emissions



24/7 Hyperscale performance
With 90% a reduction in Cooling OPEX



ESG Certificate System
individual measurement of customers' negative CO2 emissions



Where Do We Go from Here?

We have the
solutions!

Sustainable data
centers and IT
infrastructure is
our **global, shared
collective
imperative!**

Next frontier:
carbon
accounting,
credit,
transparency

Massive
opportunity
for the **OCP
community**
to lead!



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Contact info to come

Thank You

Let's continue the conversation

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