# Open. Together. OCP





# Immersion Cooling for Research and Colocation

A case-study in cooperation and partnership between OCP members







Daniel PopeCEO of Submer Technologies



#### New HQs for Next Generation Datacenters



Barcelona, Spain

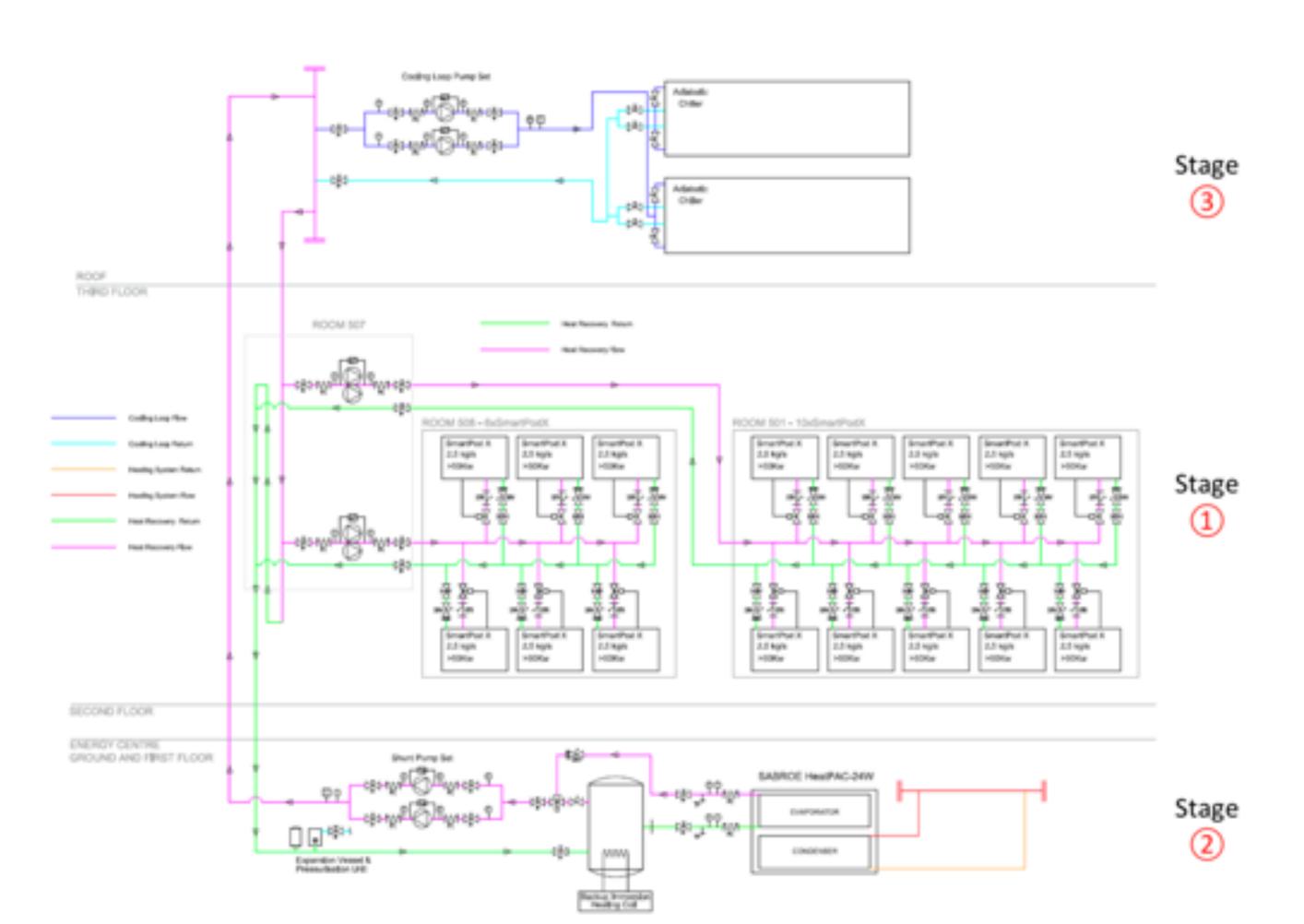


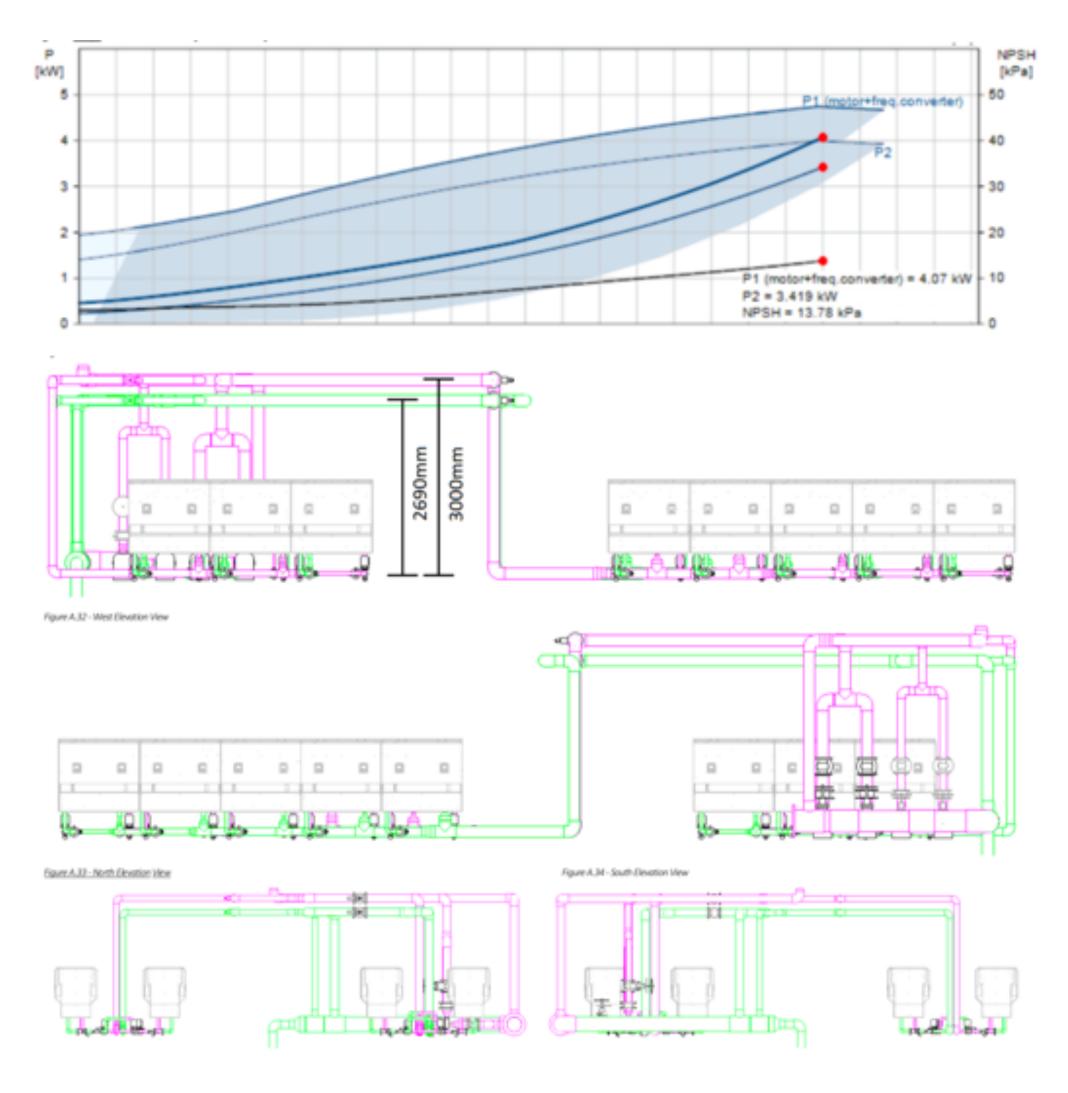
Ashburn, Virginia



#### submer

#### Holistic Engineering









## SmartPodX: First OCP Compatible Immersion Cooling Solution



- Launched March 2019 at OCP Global Summit
- Accommodates 21" and/or 19" HW
- 21 and 420U configurations
- 100kW heat dissipation with warm water
- In-house fluid engineering
- Flexible busbar options:
  - 12V-DC / 48 V-DC
  - 1, 2 or 3 busbars
  - Up to 3 separate Zones









Case Study: Immersion Cooled OCP for AI/Research

A case-study in cooperation and partnership between:

- Submer
- Publicly listed multinational
- EU public bodies
- Multiple OCP members



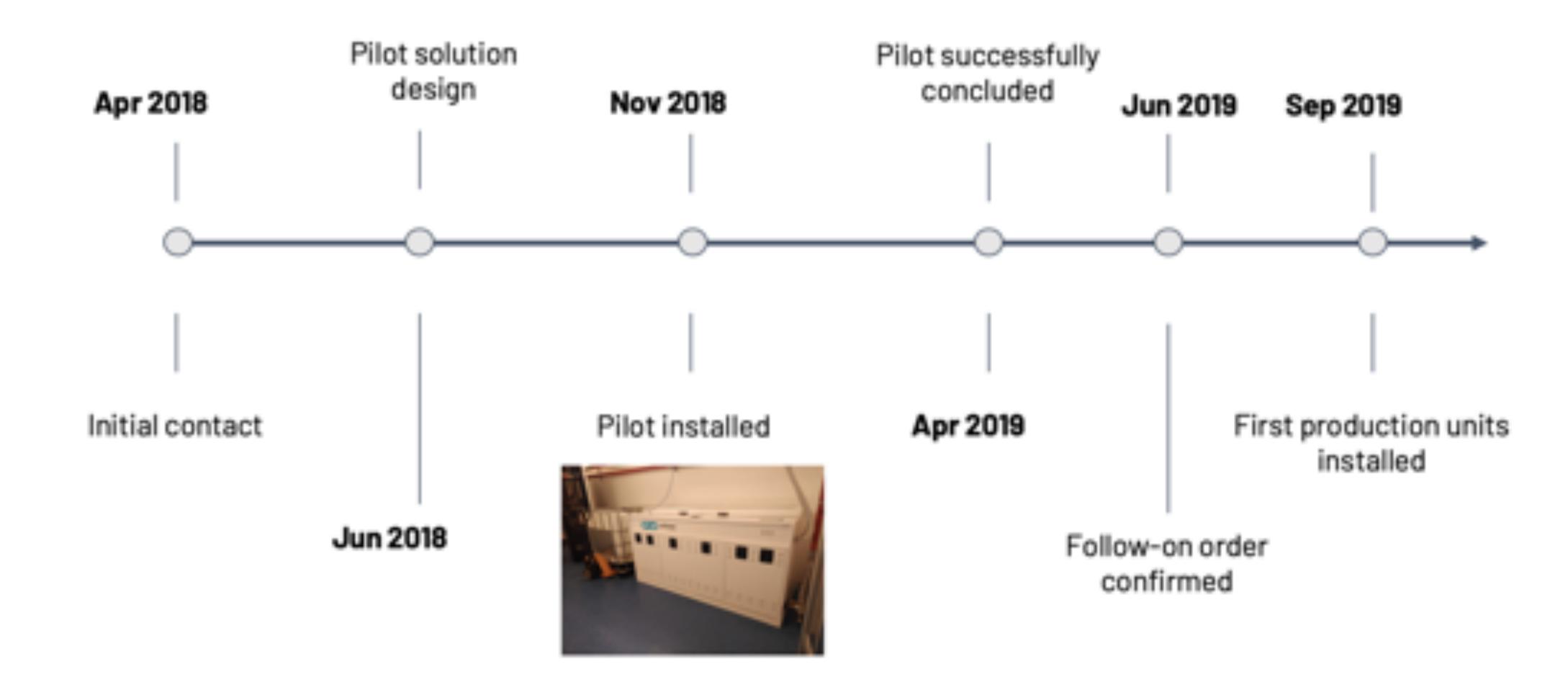








#### Timeline













### GIGABYTE







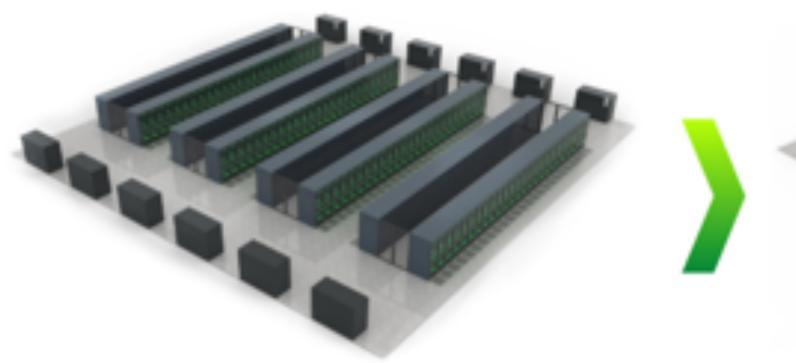


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#### Project Details

- Immersion Cooled GPUs for accelerated AI HPC
- Limited OPEX/CAPEX budget
- Greenfield facility imposing space restrictions
- Highly secure environment
- Challenge to cool efficiently in air (>2kW per node)
- Not considering OCP
- Energy Reuse





200 regular air-cooled racks (10kW/rack)

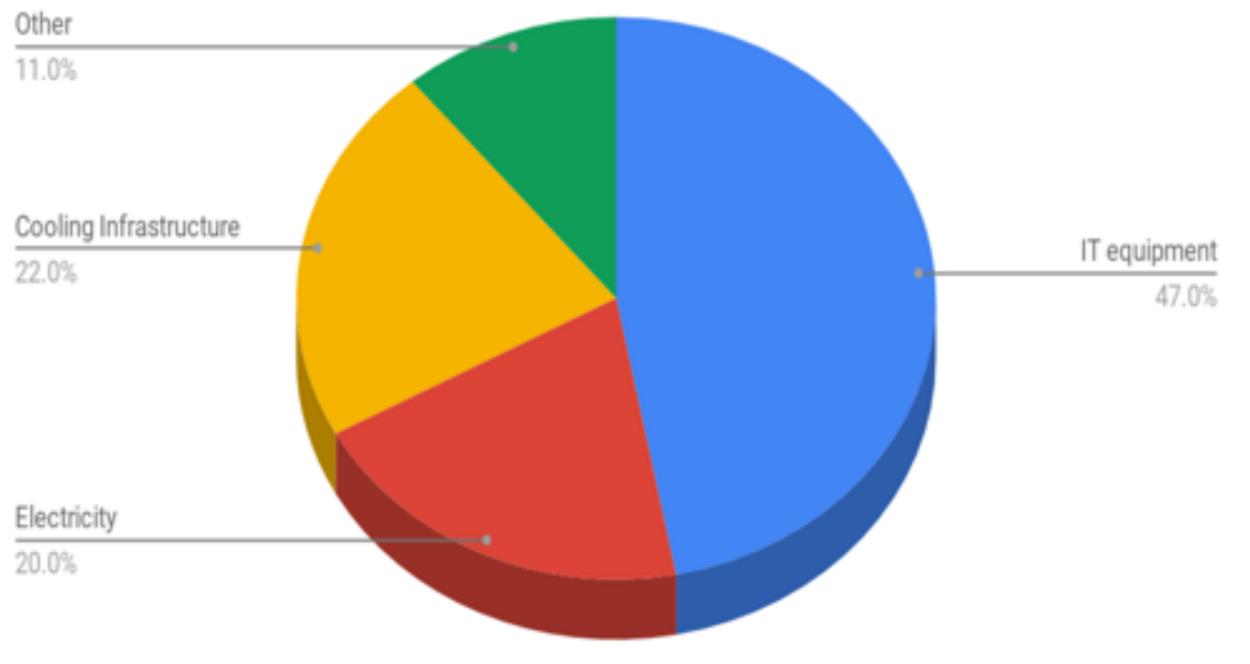
20 Submer SmartPods (100kW/Pod)



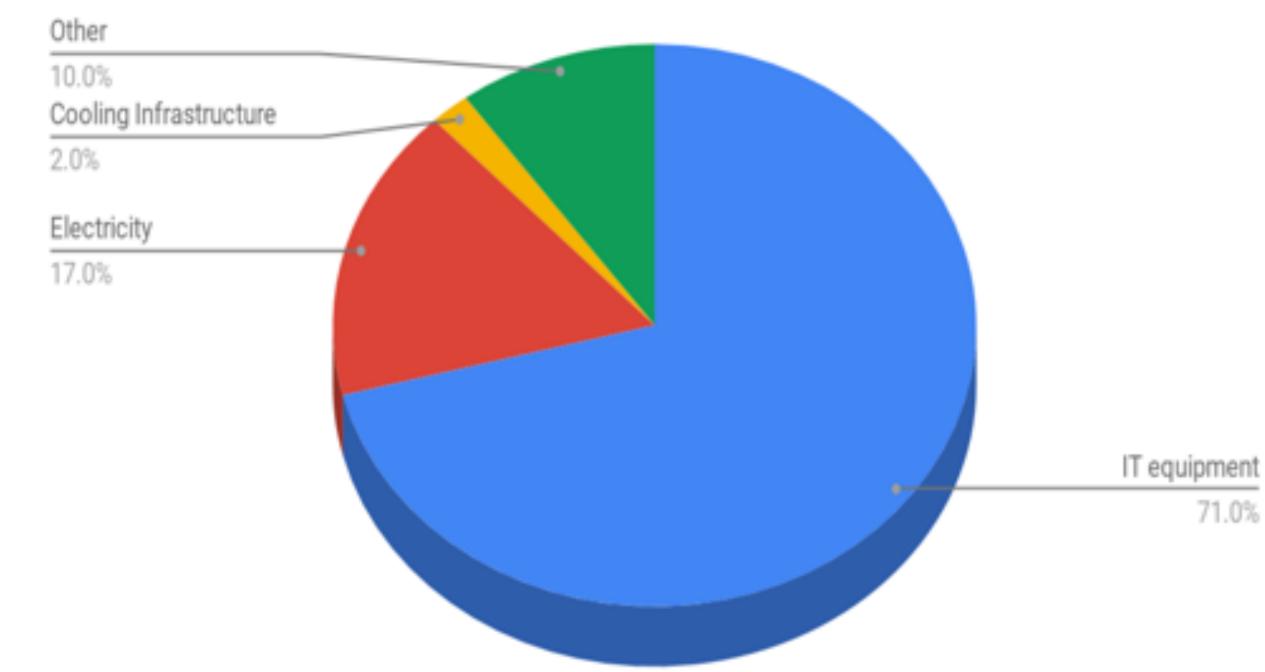


#### Why Submer Immersion Cooling?

#### Air Cooling



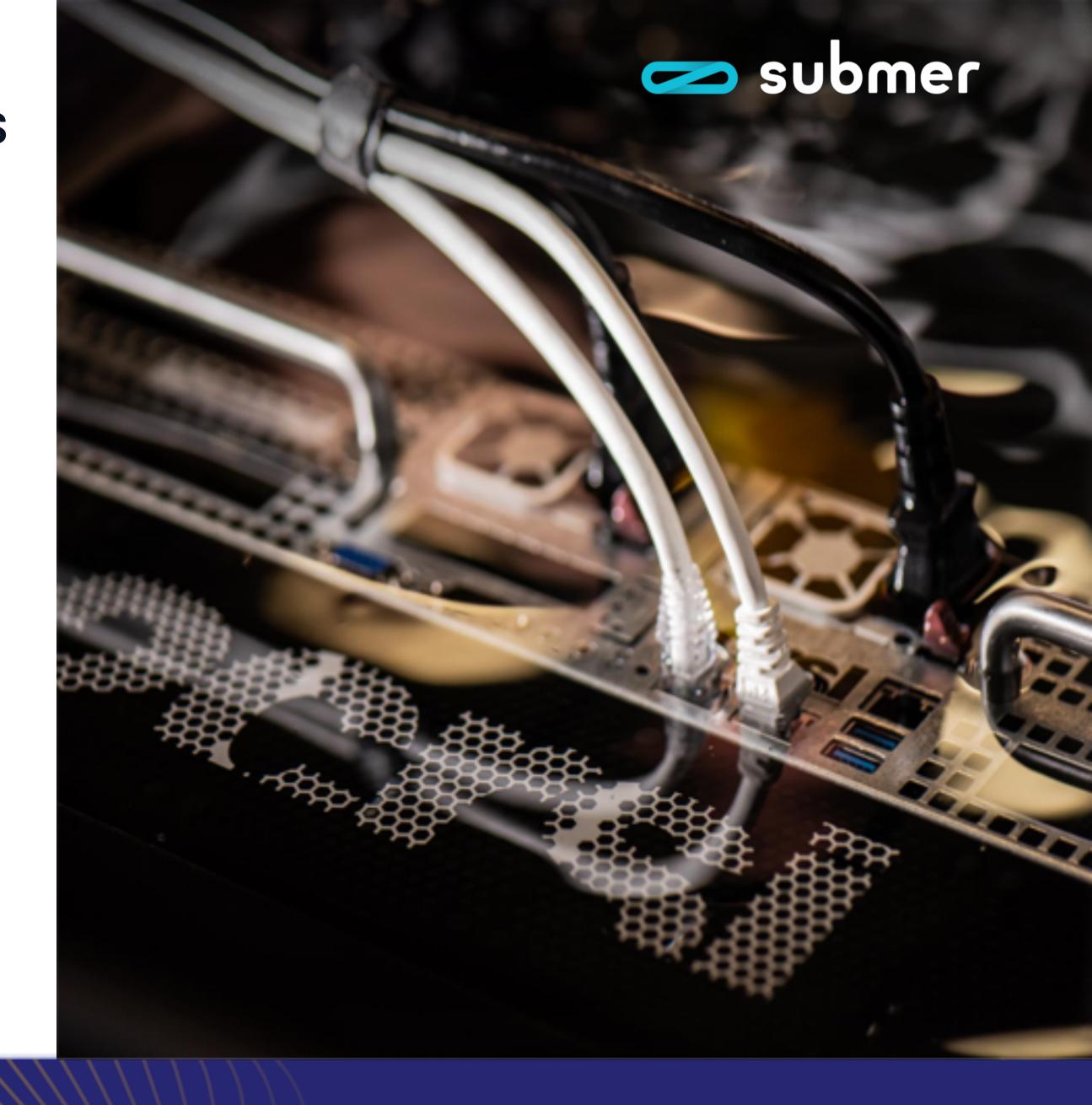
#### Liquid Immersion Cooling





#### The Configuration Components

- SmartPodXL 420U
- 2CRSI Octopus 1.8b 20U
- Lite-On OCP power shelf
- FS Fanless switches







#### The Configuration Components

# 50kW dissipation with one CDU 100kW possible with additional CDU

\*35C/40C water loop temperatures



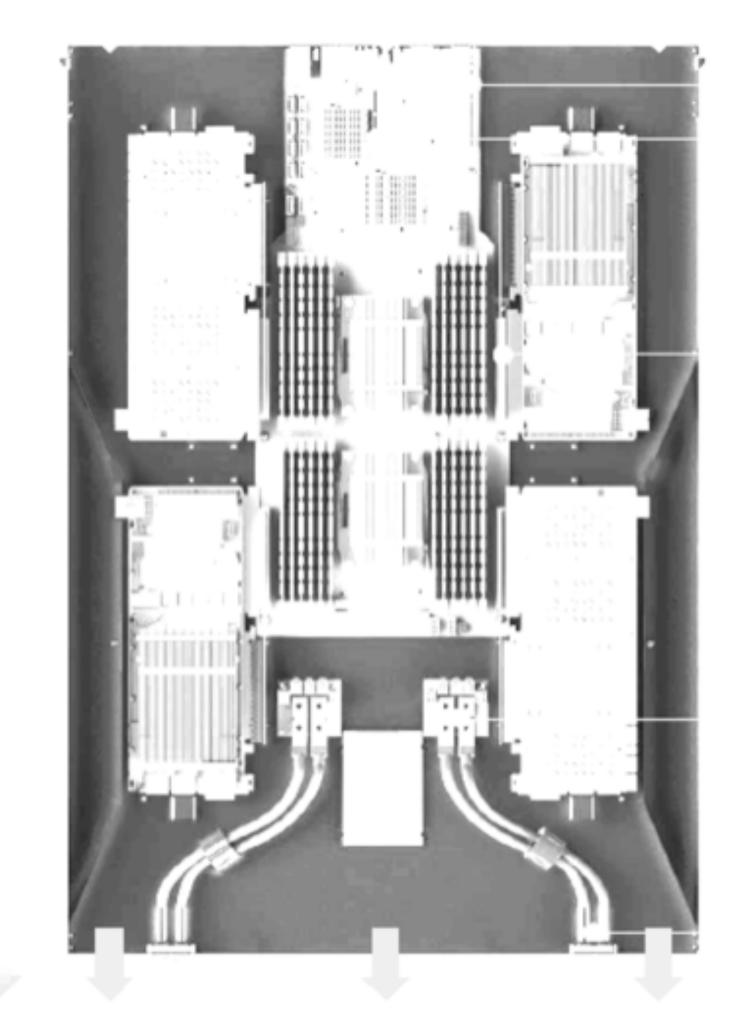




#### The Configuration Components

- 2CRSI Octopus 1.8b OCP immersion-ready server
- 2CPU, 8GPU
- 21", 12V-DC, 2 busbar connectors
- Low-profile heat-sinks
- No moving parts
- No additional parts for directing air

Result: 8% capex savings on IT vs air based companion, even including power shelf



OCP M PCIe VI 3 Std

Right-a Riser

Power Erstnist

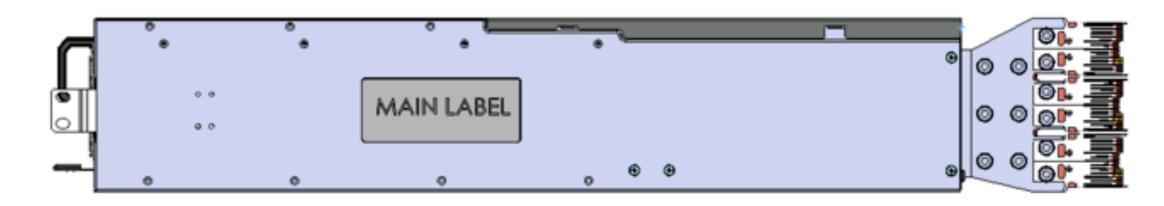
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#### Lite-On: OCP Immersion-Ready PowerShelf

- 2.5 OU 27kW (9x3kW PSU)
- 3-Phase 400V, 12V-DC
- Connects to busbars without tools
- Power feed via top/front
- Updated PSU firmware
- Hot-swappable Submerged
- Safety developments on busbars (to be disclosed to the Community)











Why did the Customer choose an Immersion Cooled OCP solution?

#### TCO

- LIC & OCP: >50% CAPEX savings vs traditional
  - LIC: economical build, more density and future proof investment
  - OCP: economical HW (further 8% hardware savings)
- LIC & OCP: >45% OPEX savings
- OCP simplifying overall operations and maintenance
- European Commission embracing "Open Standards"





By 2023, 50% of HPC deployments will be liquid cooled.





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