

# AI Data Centers

A Venture-Style Investment View on Cooling Infrastructure

Lisbon, Portugal · April 30, 2026

# Table of Contents

- Executive Summary
  - Investment Thesis
  - Demand Comes From the Top
  - Data-Center Value Chain
  - Bottlenecks and VC Opportunities
  - Why Cooling Wins
- Market Evidence and Hard Facts
  - Geographic Lens: U.S. Proof of Scale
  - Geographic Lens: Europe, Iberia, Madrid
  - Precedent Transactions
  - Target universe
  - Risks and Thesis Invalidation

# Executive Summary

## The verdict

**AI compute density has broken air cooling.**

Liquid cooling is the only VC-investable link in the \$655B AI CapEx wave, and Madrid is the entry window.

## \$655B+

**Hyperscaler CapEx**

committed for 2026 alone — a 4× rise vs 2020

## 132 kW

**Per-Rack Power**

next-gen NVL racks vs 5–15 kW air-cooled ceiling

## \$32B

**Cooling Market by 2032**

16.1% CAGR from \$9.9B, fastest-growing DC layer

## 22.5x

**EBITDA Exit Multiple**

Boyd Thermal precedente, software-like premium

## Why Now

**The thermal wall has arrived.**

Next-gen GPUs exceed 1,000W TDP per chip, and NVL racks now operate at 130–132 kW — well past the 5–15 kW air-cooling ceiling. PUE targets below 1.2 are no longer aspirational; they are a financial necessity for AI workloads at scale.

## Where to Play

**Madrid is Southern Europe's data hub.**

416 MW of pipeline (100 MW under construction), 12.69% colocation vacancy, and 32–35°C summer peaks force liquid cooling adoption. EllaLink + Equiano fiber gravity, EU AI Act sovereignty premiums of up to 60%, and Spain's renewable mix make Iberia the optimal Western European entry.

## How to Win

**Submer is the category anchor.**

Barcelona-based, €110M Series C, 1.03 mPUE, 95% energy reduction vs air. Modular SmartPod immersion enables 50–70% footprint reduction — the mandatory layer for AI-density retrofits. Exit path validated by Boyd (22.5× EBITDA) and a wave of HVAC, Power, and Water/Chemistry strategic buyers.

# Investment Thesis

Our thesis in four links:

AI density is forcing a structural rebuild of data centres: the venture-investable layer is **liquid cooling**.

|                                                                                                                                                                                                    |                                                                                                                                                                                                                  |                                                                                                                                                                                                                     |                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>1</div> <div>Physical trigger</div> <div>Air cooling has hit its ceiling</div> <div><div>&gt;1,000 W per-chip TDP</div><div>132 kW per NVL rack</div><div>Air maxes out at ~15 kW</div></div> | <div>2</div> <div>Investable Filter</div> <div>Cooling is the best VC-fit layer</div> <div><div>Energy: too CapEx-heavy</div><div>Software: saturated, low moat</div><div>Cooling: high IP, scalable</div></div> | <div>3</div> <div>Geographic Edge</div> <div>Madrid concentrates demand</div> <div><div>416 MW pipeline; 12.7% vacancy</div><div>32–35°C summers force liquid</div><div>EU AI Act → 60% pricing premium</div></div> | <div>4</div> <div>Exist Validation</div> <div>Strategics are already buying in</div> <div><div>Boyd × Eaton: 22.5× EBITDA</div><div>CoolIT × Ecolab: ~\$4.75B</div><div>Submer: clearest anchor target</div></div> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## What this means for the Portfolio

**Anchor a venture position in Submer** ahead of the Madrid build-out, with optionality on edge-cooling (YPlasma) and waste-heat reuse (Cloud & Heat). Exit timing aligns with the 2027–2029 strategic M&A wave.

### Density-mandated

Physical necessity, not preference

### Geography-locked

Madrid > Barcelona > Lisbon corridor

### Exit-validated

strategic acquirers across HVAC, power, water

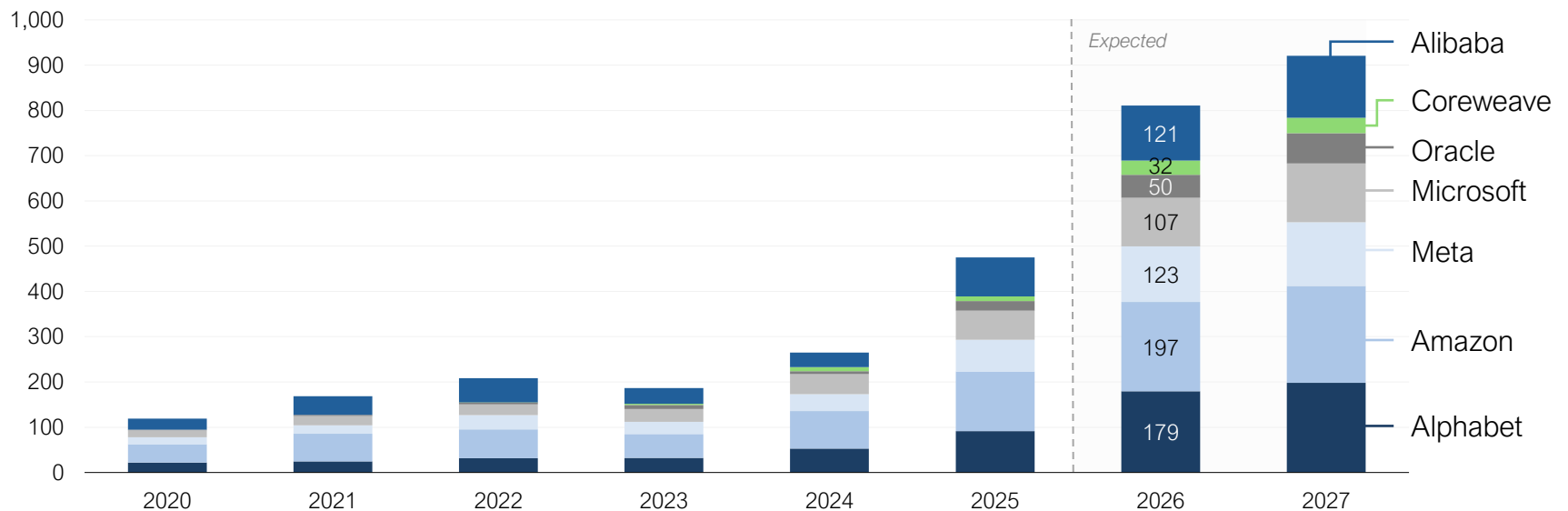
# Demand Comes From the Top

The current, non-stopping wave of AI is being captained by a concentrated group of hyperscalers, such as Microsoft, Alphabet, Meta and Amazon, which are committing hundreds of billions of dollars to scale global AI deployment. As presented in the graph, capital expenditures of this restricted group have roughly quadrupled in half a decade, with increases expected to exponentialise in the upcoming years, reflecting a structural shift towards AI driven infrastructure investment.

This commitment materialises through hyperscaler infrastructure such as data centers, high-performance computing systems and cooling technologies. By doing so, these hyperscalers act as central aggregators of AI demand, translating global market demands into large-scale infrastructurising spending.

These circumstances define a highly concentrated, capital intensive market, as a small oligopoly drives a disproportionate amount of computing growth. As a result, the pressures exerted on computing intensity, energy consumption and thermal output are surfacing underlying flaws in the hyperscaler ecosystem, particularly in cooling, creating clear opportunities for certain entities to shake the whole modus operandi of the sector.

Evolution of Hyperscalers CapEx (\$bn)



Source: Bloomberg

# Data-Center Value Chain

| Silicon & Upstream                                                                                                                                                                                                                                                                                                                                                                                                                                               | Server & Rack "Kit"                                                                                                                                                                                                                                                                                                                                                                                                                   | Thermal & Power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Data Center Owners                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Energy & Real Estate                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The limit of Moore's Law is now thermal. Focus has shifted to High-Bandwidth Memory (HBM) integration and 3D stacking, where heat dissipation is the primary bottleneck for chip scalability.</p> <p><b>TDP (Thermal Design Power)</b><br/>The maximum heat generated by a chip that the cooling system must dissipate. Historically at 200W–300W, next-gen AI chips now exceed 1,000 watts <i>per chip</i>, breaking the physical limits of air cooling.</p> | <p>The transition to integrated systems turns the rack into the new base compute unit, requiring infrastructure natively designed for extreme power densities and heavy structural loads.</p> <p><b>Rack Power Density</b><br/>While traditional cloud racks operate at 5kW–15kW, modern AI setups require immense power, pushing densities up to 120 kW per rack, demanding completely redesigned weight and power distribution.</p> | <p>Liquid cooling has transitioned from a niche option to a mandatory standard. It is the most critical and under-invested link in the value chain, essential for unlocking maximum hardware performance.</p> <p><b>Power Usage Effectiveness</b><br/>The universal metric for data center energy efficiency. Legacy air-cooled facilities sit around 1.5–1.6. Liquid cooling optimizes this ratio, driving it down to &lt; 1.2 PUE, which translates to millions in annual OpEx savings for operators.</p> | <p>The divide between legacy operators and new "AI Factories" lies in the building shell's capacity to support massive thermal demands. Asset value is now strictly tied to thermal engineering capabilities.</p> <p><b>Legacy Incompatibility</b><br/>Inability of older buildings to host high-density compute. Due to insufficient floor load and a lack of liquid cooling plumbing, an estimated ~70–80% of current global stock requires deep, costly retrofits to support AI clusters.</p> | <p>Energy availability dictates expansion. In Iberia, the competitive advantage is not just land cost, but rapid access to renewable energy grids and high-voltage infrastructure resilience.</p> <p><b>ESG &amp; Grid Access</b><br/>Hyperscalers are bound by aggressive Net Zero commitments. Iberia's core advantage lies in its abundant solar and wind resources, allowing the consumption to be 100% renewable energy only, meeting ESG goals.</p> |
| <p><u>High-Bandwidth Memory</u></p>                                                                                                                                                                                                                                                                                                                                             | <p><u>Compute Systems</u></p>                                                                                                                                                                                                                                                                                                                        | <p><u>Liquid Cooling &amp; CDUs</u></p>                                                                                                                                                                                                                                                                                                                                                                                   | <p><u>Liquid Cooling &amp; CDUs</u></p>                                                                                                                                                                                                                                                                                                                                                                       | <p><u>Land &amp; Connectivity</u></p>                                                                                                                                                                                                                                                                                                                                  |
| <p><u>Fabs &amp; Foundries</u></p>                                                                                                                                                                                                                                                                                                                                            | <p><u>Networking (800G/1.6T)</u></p>                                                                                                                                                                                                                                                                                                               | <p><u>Backup &amp; Switchgear</u></p>                                                                                                                                                                                                                                                                                                                                                                                   | <p><u>Backup &amp; Switchgear</u></p>                                                                                                                                                                                                                                                                                                                                                                       | <p><u>Utility &amp; Power Generation</u></p>                                                                                                                                                                                                                                                                                                                         |
| <p><u>AI Chips</u></p>                                                                                                                                                                                                                                                                                                                                                         | <p><u>Power Management ICs</u></p>                                                                                                                                                                                                                                                                                                                 | <p><u>Energy Storage / BESS</u></p>                                                                                                                                                                                                                                                                                                                                                                                     | <p><u>Energy Storage / BESS</u></p>                                                                                                                                                                                                                                                                                                                                                                         | <p><u>Energy Storage / BESS</u></p>                                                                                                                                                                                                                                                                                                                                  |

# Bottlenecks and VC Opportunities

| Bottlenecks    | Why is it important?                                 | Investable for VC? | Why?                                                                                                                                                         |
|----------------|------------------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regulation     | Dictates "Ready-to-Build" status and ESG compliance. | No                 | Purely bureaucratic and has no direct equity upside. It is a binary risk to be monitored, not a scalable product.                                            |
| Energy / Water | Primary inputs. Critical for hyperscale operations.  | No                 | Heavy Infrastructure. High CapEx, low VC-style scalability. Stable returns (Yield), but slow growth for the 10x VC profile.                                  |
| Software       | Management and optimization of workloads (DCIM).     | Low                | Current software market in stress and has high competition/low stickiness. SaaS saturation, low differentiation and risk of internalization by Hyperscalers. |
| Cooling        | Core enabler for AI-density (30kW+ per rack).        | Yes                | High tech-differentiation, manageable CapEx, massive IP value. High Tech Moat. Proprietary IP, moderate CapEx and very high technical barrier to entry.      |

- ❑ **Market Saturation:** The management software market is fragmented and under price pressure ("stress"). Many operators prefer *open-source* solutions or proprietary tools (Google/Amazon), reducing the total addressable market (TAM) for startups.
- ❑ **Not all bottlenecks are equity opportunities:** Building substations or water infrastructure requires hundreds of millions in initial CapEx. While energy is the biggest obstacle, it's a game of infrastructure and debt, not venture capital.
- ❑ **Cooling as a Multiplier:** Innovation in Liquid Cooling enables AI densities that current buildings cannot support, enhancing the value of existing Real Estate.
- ❑ **Optimal Fit:** The cooling industry offers the perfect balance between physical necessity (such as utilities) with scalable intellectual property (such as software), without the financial burden of building the national power grid.

# Why Cooling Wins

Data center viability is now strictly tied to power efficiency. With the industry average Power Usage Effectiveness (PUE) sitting around 1.8, operators face unsustainable power budgets when scaling modern AI workloads. Achieving the highly efficient ~1.2 PUE benchmark is no longer just a sustainability target; it is a financial necessity. Liquid cooling provides the only viable structural shift capable of handling extreme thermal densities while protecting operating margins.

The current cooling market remains highly fragmented, driven by specialized pure-play vendors rather than traditional server manufacturers. Innovators such as ZutaCore, LiquidStack, CoolIT, GRC, Submer, and Vertiv are defining the standards across direct-to-chip and immersion technologies. Looking ahead, the industry will not converge on a single method. Instead, operators will manage hybrid environments, deploying targeted cooling technologies strategically matched to specific rack densities.

Navigating this market requires a pragmatic, use-case-driven approach. Operators must evaluate their existing facility constraints against the distinct requirements of direct-to-chip or immersion systems. The best capital allocation strategy avoids high-risk, full-scale overhauls. Organizations should instead shortlist vendors with proven deployments in comparable environments, pilot localized high-density zones and scale their infrastructure progressively alongside AI demand.

## Cooling Strategies

### Reat-Door Heat Exchange

40–60 kW / rack

Coolant is delivered directly to processors via cold plates, removing heat at the source.

### Direct-to-Chip

60–120 kW / rack

Servers are submerged in dielectric fluid, which absorbs and dissipates heat efficiently.

### Immersion Cooling

100–150+ kW / rack

A liquid-cooled heat exchanger mounted on the rack's rear captures and removes hot exhaust air.

>1000w

Per Chip TDP (Next-gen GPUs)

<1.2 PUE

Efficiency Benchmark

~80%

Legacy Stock Estimate

3000x

Thermal Transfer (Liquid vs air per unit of volume)

Source: McKinsey Private Capital

# Market Evidence and Hard Facts

The structural demand signal is unambiguous. Global hyperscalers have committed **\$655B+** in CapEx for 2026 alone, translating directly into explosive growth in data center construction, power consumption, and, critically, thermal management requirements.

GPU rack power density has crossed the **air-cooling threshold**: next-gen NVL racks operate at **130–132 kW** per rack vs. the traditional 5–15 kW ceiling. This physical constraint makes liquid cooling *mandatory*, not optional.



\$185B



\$200B



\$75B



\$65B



\$14–50B

>1,000W

Per-Chip TDP (next-gen GPUs)

132 kW

NVIDIA GB200 NVL Rack Power

<1.2 PUE

Efficiency benchmark — only liquid achieves this

~40%

Of DC energy consumed by cooling (largest single cost)

945 TWh

Global DC electricity use projected by 2030 (IEA)

\$32B

DC Cooling market size by 2032 (16.1% CAGR from \$9.9B)

Sources: Company earnings calls Q4 2025 / Q1 2026; NVIDIA GB200 NVL72 spec sheet; IEA Data Centres 2025 Report

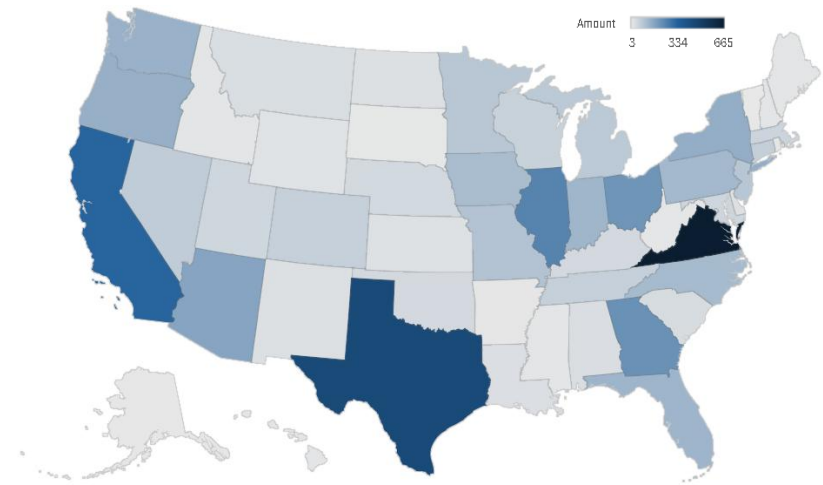
# Geographic Lens: U.S. as a Reference Market

The American global economic supremacy can be visualized through the digital lens. The country possesses **~4,200** data centers, mainly concentrated in 3 states:

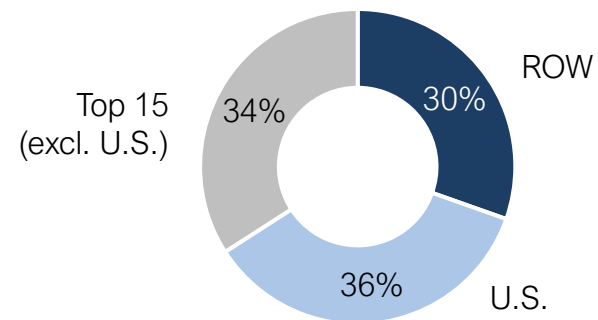
- **Virginia** – 665 data centers, and home to ~35% of worldwide hyperscaler data centers. Prospering as a result of key tax exemptions, geographic advantages and cheap energy (commercial price 30% lower than US average)
- **Texas** – 439 data centers. Predicted to possess biggest amount of world data centers in the world by 2030. Great potential due to abundant energy sources (natural gas) and decentralized ERCOT grid.
- **California** – 321 data centers. Benefits from Silicon Valley proximity and urban low-latency demand.

An analysis conducted by St. Louis Federal Reserve Bank concluded AI categories contributed **0.97 p.p.** to real GDP growth in the first three quarters of 2025. Still, the data center market is not planned to stagnate here. It is predicted to grow at a **CAGR of 34.2%** up until 2032, leading the American economy into a positive trajectory.

The VC market heavily contributed to these outputs, being **600 billion \$** deployed in the US since 2020. In 2025, AI captured roughly **71%** of all US VC equity investments, remaining the country the dominant destination for capital deployment. Unmatched innovation, frequent exit pathways and early adoption of technology are some of the reasons behind investors choices.



Global AI Data Center Share (%)



~4200

Data Centers

\$600bn

VC investments since 2020

34.2%

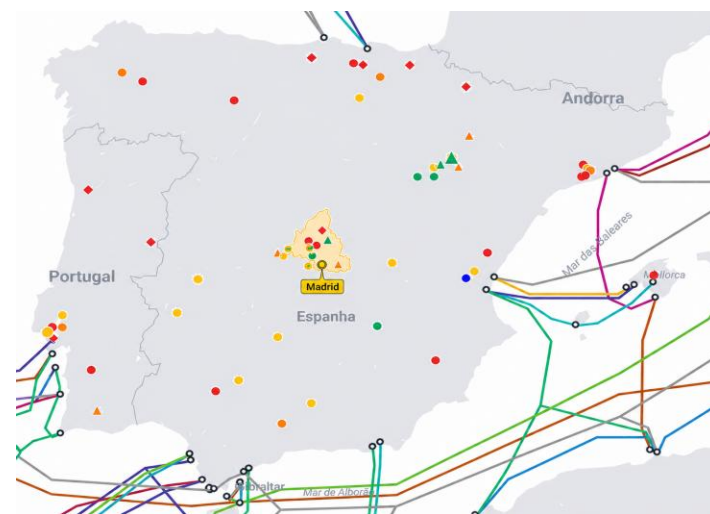
CAGR until 2032

# Geographic Lens: Europe > Iberia > Madrid

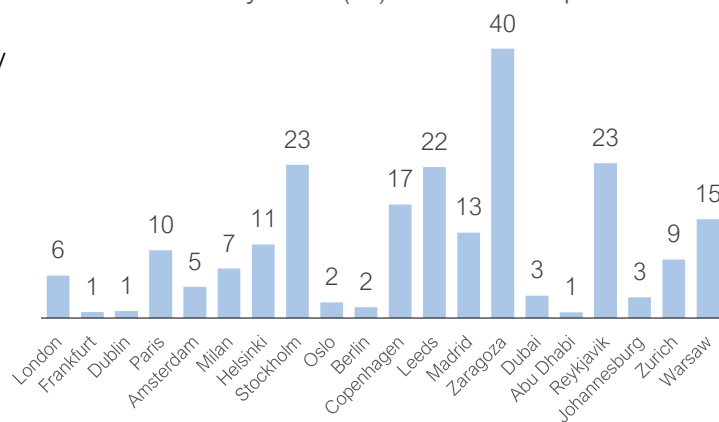
- ❑ **Madrid Data Center Snapshot (Key Metrics)**
- ❑ **Colocation Vacancy:** 12.69%.
- ❑ **Live Capacity:** 228 MW.
- ❑ **Pipeline & Construction:** 416 MW (100 MW Under Construction + 316 MW Planned).
- ❑ **Number of Facilities:** 39 Data Centers.
- ❑ **Climate (Average Highs):** Summer peaks of 32°C – 35°C
- ❑ **Regulatory/Infra Highlights:** Implementation of the **EU AI Act** (mandating data sovereignty) and the consolidation of the **EllaLink/Equiano** fiber axis, establishing Madrid as the central data distribution hub for Southern Europe.

## Connectivity Hub, Thermal Challenge & Regulatory Viability

Madrid has emerged as the central connectivity hub for Southern Europe, functioning as a strategic bridge for the Americas and Africa through low-latency fiber routes like EllaLink and Equiano. This concentration of "data gravity" is met by a critical climatic challenge, where average summer peaks of 32°C–35°C mandate the use of advanced liquid and immersion cooling for high-density AI clusters to maintain operational efficiency. The viability of these capital-intensive investments is secured by the EU AI Act and "Sovereign AI" mandates, which create high-margin demand for localized infrastructure and drive pricing premiums of up to 60%. Furthermore, investment risk is mitigated by Spain's robust renewable energy mix and streamlined "General Interest" regulations, permitting frameworks, which consolidate approval processes and accelerate delivery timelines for large-scale, energy-integrated campuses.



Vacancy Rate (%) Across Europe



Madrid's unique combination of high vacancy, connectivity gravity, and thermal necessity makes it the primary target for cooling-tech VCs.

# Precedent Transactions

Strategics are assembling "chip-to-grid" thermal capability at unprecedented scale. The wave of M&A below confirms that liquid cooling has crossed from niche to strategic necessity with acquirers spanning from HVAC giants, industrial conglomerates, to non-traditional entrants from water/chemistry.

| Target                                                                             | Date     | Type                    | Amount                   | Acquirer                                                                                                                                                                | Niche                                | Signal                                                             |
|------------------------------------------------------------------------------------|----------|-------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------|
|    | Nov 2025 | Acquisition             | \$9.5B 22.5x adj. EBITDA |   | Scaled liquid cooling "chip-to-grid" | <i>Largest disclosed multiple; sets platform premium benchmark</i> |
|    | Mar 2026 | Acquisition             | ~\$4.75B                 |   | CDUs / cold plates / direct liquid   | <i>Non-traditional buyer (water/chemistry) entering AI cooling</i> |
|    | Oct 2024 | Majority stake (staged) | \$850M+25% by 2028       |                                                                                      | Direct-to-chip CDUs for HPC          | <i>Option-like structure; staged acquisition precedent</i>         |
|    | Feb 2026 | Acquisition             | Undisclosed              |                                                                                      | Immersion + direct-to-chip liquid    | <i>2nd buy, "central plant to chip" confirmed</i>                  |
|    | Dec 2025 | Acquisition             | Undisclosed              |                                                                                      | Modular prefab cooling + CDUs        | <i>Modular = speed-to-deploy; capacity crunch playTrane's</i>      |
|   | Nov 2025 | Acquisition             | Undisclosed              |                                                                                     | Neg. pressure CDUs + modular         | <i>Daikin's 2nd buy in 3 months, platform-build confirmed</i>      |
|  | Feb 2024 | Acquisition             | ~\$190M EV               |                                                                                    | Air handling / facility thermal      | <i>Mid-market comp, "boring but essential" scaling</i>             |

Sources: Company press releases; SEC filings; Bloomberg MA; Write-up Information (LIS Internal Research)

# Precedent Transactions

Iberia-Adjacent



submer

Barcelona, Spain - Immersion Cooling

€50.2M

Growth round · Oct 2024 · Lead: M&G

SmartPod immersion systems deployed across AI factories. Proves European VC appetite for Iberian cooling platforms and direct strategic path into Madrid buildout.

Single-Phase Immersion, Strategic Growth



Austin, TX — Single-Phase Dielectric Immersion

Strategic Rd.

2025 · Lead: Samsung Ventures

Leader in single-phase dielectric immersion (ICEraQ micro-modular systems), proven to reduce TCO by up to 50% versus conventional air cooling. Samsung Ventures and two Asian energy firms co-investing validates immersion as a board-level industrial priority.

European Immersion, Scale-Up Round



Amsterdam, Netherlands — Natural Convection Immersion

Scale-up Rd.

Sep 2025 · Lead: Stecon Group / Invest-NL

European leader in passive natural convection immersion (AIC24 platform). Capital targets manufacturing scale-up and modular data centre integration. Confirms pan-European VC appetite for immersion cooling ahead of the EU PUE <1.3 mandate by 2030.

What This Transaction Set Signals:

## Acquirer Diversity Expanding

- HVAC OEMs (Trane, Daikin), Power (Eaton, Schneider), Water/Chemistry (Ecolab) - signals that cooling is becoming a cross-sector strategic priority, not just an IT infrastructure niche.

## Speed-to-Deploy as Differentiator

- Trane's modular/prefab positioning (Stellar) confirms that deployment speed - not just technology - is a strategic moat during the current capacity crunch.

## Platform Premiums at 20x+ EBITDA

- Boyd Thermal's 22.5× adj. EBITDA multiple is direct evidence that liquid cooling assets command software-like multiples when scaled and differentiated for high-density AI workloads.

## Iberian Entry Window Open

- Submer (Barcelona) shows VC-backed European immersion scaling is possible. Madrid's pipeline of 416 MW (100 MW under construction) creates the demand basin for early-stage cooling plays.

Sources: Bloomberg MA; company announcements

# Target Universe

**Submer** is the strategic anchor to capture Madrid's AI growth through future-proof, high-density infrastructure.



**\$110M**

series C funding as of 2024

**95%**

Reduction in cooling energy  
vs. traditional air-cooling.

**Barcelona**

Headquartered

**1.03<sub>m</sub>PUE**

Industry-leading mechanical  
Power Usage Effectiveness.

**2015**

Foundation year

**150 FTEs**

Global reach with an Iberian core;  
partnerships with Telefónica

## Main Product & Scalability

- ❑ **Main Product:** SmartPod EXO/EVO. A modular liquid immersion cooling system that uses a proprietary biodegradable dielectric fluid.
- ❑ **Scalability:** Allows for 50%–70% footprint reduction, enabling "water-free" high-density deployments in land-constrained or water-scarce urban hubs like Madrid.

## VC Perspective & Exit Options.

- ❑ **VC Perspective:** Submer is the "Category King" in immersion cooling. It solves the physical limit of silicon heat, making it a mandatory component for AI infrastructure. It transforms standard data centers into AI-Ready assets.
- ❑ **Exit Strategy:** Likely acquisition by Industrial MEP giants or a secondary buyout by Infrastructure Mega-Funds.



- ❑ **Region:** Madrid, Spain.
- ❑ **Product:** Plasma Actuators (Ionic Airflow). Uses high-voltage plasma to generate "ionic wind." It moves air with zero moving parts, making it silent and virtually maintenance-free.
- ❑ **Size:** Seed Phase (~\$2.5M).
- ❑ **Investment Angle:** Ideal for Edge Data Centers where maintenance logistics are costly.



- ❑ **Region:** Dresden, Germany.
- ❑ **Product:** Direct-to-Chip Liquid Cooling. Captures server heat into water (up to 70°C) for reuse in heating grids or industrial processes.
- ❑ **Size:** Series B (~\$17M raised).
- ❑ **Investment Angle:** 2It is the ultimate solution for the EU Energy Efficiency Act. It turns a "waste" (heat) into a sellable utility, securing the asset's "Green" status and facilitating difficult building permits.

# Risks and Thesis Invalidation

| Risk             | What it means                                                                  | Why it matters                                                                                            |
|------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Slow Adoption    | Industry stays with traditional air cooling longer than expected.              | Delays the ROI on liquid cooling specialized startups.                                                    |
| Legacy Viability | Retrofitting old tech becomes cheaper than buying new infra.                   | Favours established players over VC-backed tech and shrinks the Addressable Market (TAM) for new players. |
| Internalization  | Hyperscalers (Google/Amazon) develop their own cooling IP.                     | Reduces the exit opportunities and "buy-out" potential for startups.                                      |
| Infra Slowdown   | Iberian grid delays exceed 5 years and stop data center construction entirely. | No new buildings = no demand for new cooling systems. Stops the construction of new DCs.                  |
| Water Scarcity   | Regulation bans water-intensive cooling in arid Iberia.                        | Forced pivot to more expensive or less efficient dry systems.                                             |

Our thesis is based on the premise that AI compute density will make traditional cooling physically impossible.

In which scenarios are our thesis wrong?

- ❑ **Efficiency over Power:** If the development of semiconductors (chips) focuses drastically on heat reduction rather than raw performance, keeping densities below 15kW/rack and if their efficiency increases so much that the heat generated decreases drastically (unlikely with the evolution of AI).
- ❑ **Grid Paralysis:** If the energy bureaucracy in Spain and Portugal stagnates the market for >5 years, causing capital to flow to other regions (such as North Africa).
- ❑ **Capital Dryness:** If the cost of capital (interest rates) remains high; making it impossible to build new campuses and forcing industries into a regime of maintenance rather than innovation.

# Publication Details

## LIS Alternative Investments

This report has been prepared by the Lisbon Investment Society (LIS) Global Edge: Alternative Investments – Venture Capital team, an independent, student-led, non-profit organization based at ISEG – Lisbon School of Economics & Management.

Please see important disclaimers at the end of this document.

This report reflects the independent analysis of the Alternative Investments team and the oversight of the Global Edge Department.

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