Application: 6028

MV1: The World’s First and Only Operational, Off-Grid, Hydrogen-Powered AI Data Center

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Page: General Information

Provide information about the company to be considered for the award. If you will be nominating an individual, specify the nominee’s employer.

Name of Organization/Company

ECL

[redacted]

Additional Contacts

I do not wish to list additional contacts

Page: Entry Information

Entry Title

MV1: The World’s First and Only Operational, Off-Grid, Hydrogen-Powered AI Data Center

Category

K03. Technical Innovation of the Year - Energy Technology

Technical Innovation of the Year Submission Format

Written Answers

a. Briefly describe the organization that achieved the nominated technical innovation: its history and past performance (up to 200 words). Required

ECL unveiled MV1, the world’s first off-grid, zero-emissions AI data center powered by hydrogen, in Mountain View, CA, in June 2024, setting a new benchmark for sustainable, high-performance computing.

Founded in 2020 and launched in January 2023, ECL is led by Yuval Bachar, who previously held top engineering, infrastructure, and architecture roles at Microsoft Azure, LinkedIn, Facebook, and Cisco. The company raised $7 million in seed funding from Molex Ventures and Hyperwise Ventures, which supported MV1’s construction.

MV1 was created to address the urgent need for sustainable, high-performance infrastructure to support AI and advanced technologies. With global data center power capacity under strain, ECL recognized the necessity for a fundamental redesign. ECL aimed to pioneer efficient and eco-friendly data center solutions that enhanced energy efficiency, reduced water consumption, and integrated seamlessly into the local community. This vision led to the creation of MV1, completed in just 9 months—far faster than the industry’s typical 2–5 years.

In September 2024, ECL announced TerraSite, the world’s first 1GW hydrogen-powered data center campus, located near Houston, TX. The first phase, sourcing hydrogen from three converging pipelines, will launch in early 2026. Lambda has been confirmed as the first tenant.

b. Outline the nominated technical innovation. Be sure to describe it in terms that someone with limited knowledge of the technology can understand and appreciate (up to 250 words). Required

ECL’s MV1 is a first-of-its-kind technological breakthrough: the world’s first hydrogen-powered, off-grid data center in active production. Unveiled in Mountain View, California in June 2024, MV1 operates with zero carbon emissions, no connection to the electric grid, and eliminates external water use entirely. The system also generates surplus clean water as a byproduct of hydrogen fuel cells, which can be supplied to nearby communities, transforming a traditionally resource-intensive facility into one that gives back.

MV1 sets a new benchmark for high-performance, sustainable computing. It consistently achieves a Power Usage Effectiveness (PUE) ratio of 1.1 or better and supports up to 75 kilowatts per rack — ideal for AI workloads. Notably, Lambda has deployed dual Supermicro NVL72 racks at MV1, powering over 3.6 million GPU cores entirely on hydrogen, with zero emissions and zero water consumption. This level of compute density, powered entirely by clean energy, represents a paradigm shift in how data centers can scale AI innovation without compounding environmental impact.

The facility was delivered in just nine months, an extraordinary pace in an industry where new data centers often take years to come online. This rapid deployment capability enables organizations to accelerate climate action and AI development on compressed timelines, meeting urgent global and market demands. The modular architecture used at MV1 allows for efficient replication and scalability, ensuring that future facilities like the planned TX1 site can deliver even greater impact. MV1 represents not only a breakthrough technology, but also a scalable blueprint for sustainable digital infrastructure.

c. Explain why the technical innovation you have highlighted is unique or significant (up to 250 words). Required

ECL's groundbreaking achievements in the AI and data center sectors position the company as a leader in both sustainability and innovation. With the unveiling of MV1, the world’s first off-grid, zero-emissions AI data center powered by hydrogen, ECL has set a new benchmark in the industry. While other data center providers have deployed hydrogen fuel cells for backup power or conducted trials of hydrogen-powered systems set for future delivery, ECL is the first to fully operationalize a sustainable hydrogen-powered data center. This achievement is significant not only for its environmental impact but also for its capacity to deliver reliable, scalable, and high-performance computing.

Unlike traditional data centers that rely on fossil fuels or large-scale electrical grids, ECL’s solution generates power using hydrogen fuel cells, producing excess water as a byproduct. This water is repurposed for cooling, eliminating the need for external water sources and reducing environmental strain. This unique approach to sustainability, combined with industry-leading performance, places ECL ahead of its competitors and offers a cost-effective, environmentally responsible solution for businesses seeking to meet their sustainability targets.

ECL’s rapid nine-month deployment of MV1 further demonstrates the company’s exceptional speed to market, which is particularly critical in addressing the current demands of AI. The AI industry is experiencing exponential growth, requiring data centers that can provide the necessary high-performance infrastructure without delay. ECL’s fast deployment timeline offers businesses the agility they need to scale rapidly and meet the ever-increasing demands of AI workloads.

d. Reference any attachments of supporting materials throughout this nomination and how they provide evidence of the claims you have made in this nomination (up to 250 words). Optional

Hydrogen White Paper:
https://www.ecldc.com/wp-content/uploads/2024/02/Hydrogen-Carbon-White-Paper-Jan-2024.pdf

This white paper provides an in-depth analysis demonstrating how ECL's hydrogen-based microgrid solution significantly reduces or completely eliminates Scope 1 and Scope 2 carbon emissions compared to traditional grid-connected data centers. It specifically details how even grey hydrogen offers carbon footprint advantages relative to average U.S. grid power, while blue and green hydrogen substantially outperform traditional power sources.

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