



# hello tomorrow

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## HyWatts

### General Information

HyWatts delivers reliable, low-cost zero-emission energy anywhere with our breakthrough hydrogen-based energy storage technology.



Website

[www.hywatts.com](http://www.hywatts.com) (/www.hywatts.com)



Track

Energy ⚡



Location

Berkeley, United States



Incorporation

Incorporated since Aug 19, 2023 in United States

### Public Description

HyWatts' power-plant-in-a-box™ addresses the needs of power-intensive, high-growth industries such as EV charging stations, data centers, warehouses & manufacturing by delivering reliable and low-cost zero-emission energy via on-site solar energy production combined with our breakthrough hydrogen-based energy storage technology. This solution targets a \$500B market opportunity.

We have 7 LOIs worth \$57M, with two converted into feasibility studies (~\$175k). We also have strong traction with grants, including a Phase I SBIR grant for the Marine Corps and a \$200k DOE award. We have closed our \$1M pre-seed round, which was supported by reputable investors: Aloniq, Climate Capital, BuildTechVC, and TechStars.

## HyWatts Pitch - June 2024



If the video does not appear, please follow this link : [🔗 \(https://www.youtube.com/watch?v=tb4R-yhc2M8\)](https://www.youtube.com/watch?v=tb4R-yhc2M8)

### Slide Deck

Slide Deck 1 : \$1Bn HyWatts Deck - Fall 2024.pdf (<https://media.hello-tomorrow.org/media/6a56c6186eb94d68a54c3e7186992101>)

Slide Deck 2 : Answer to the question received on November 14, 2024 from Peupedje Mendy.pdf (<https://media.hello-tomorrow.org/media/6a55c9104bd14d7c98902a78bd139dda>)

### Pictures of the product



## Problem & Solution

### Problem

HyWatts is solving the problem of the lack of infrastructure to meet the skyrocketing energy demand of power-intensive, high-growth industries by providing reliable, low-cost, zero-emission energy through on-site solar energy production combined with breakthrough hydrogen-based energy storage technology.

### Solution

Our solution, the Power-Plant-in-a-Box™, is a zero-emission system that combines solar generation with our breakthrough hydrogen-based energy storage technology. This system provides continuous renewable power on-site, addressing the exponential growth in energy demand without relying on the grid. It offers reliable, low-cost on-site energy, making it ideal for EV

charging stations, data centers, and other energy-intensive industries. The system converts excess solar energy into hydrogen, which is then stored and used to generate power when needed, ensuring a continuous energy supply. This approach allows for faster deployment of critical infrastructure at a lower capital expenditure and cost per kilowatt-hour.

## Impact

HyWatts' impact on relevant industries and society is substantial, driven by our innovative Power-Plant-in-a-Box™ system. This technology integrates solar energy production with hydrogen storage using a high-temperature proton-exchanged membrane (HTPEM) Reversible Fuel Cell. Our system aims to enhance efficiency, cut costs, and provide a reliable, renewable power solution that stabilizes supply and reduces environmental impact. Notably, our technology has the potential to reduce capital expenditures (CapEx) by more than two times compared to existing hydrogen technology and by over five times compared to lithium-ion battery technology.

## Sustainable Development Goals

Affordable and clean energy • Climate action • Industry, innovation and infrastructure • Responsible consumption and production • Sustainable cities and communities

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## Product Type

### Product Type

Physical product

### Product Description

HyWatts' core technology is the Reversible HTPEM Fuel Cell, which combines the functions of an electrolyzer and a fuel cell into a single unit. This innovation is enabled by a proprietary conducting polymer and high-temperature membrane, allowing both electrochemical processes in one cell. This reduces CAPEX by over 2x compared to traditional hydrogen systems and by 5x compared to Li-ion batteries. The system's CAPEX is around \$40/kWh, significantly lower than other long-duration storage technologies. Additionally, the electricity generation cost is \$0.11/kWh for HyWatts, compared to \$0.25/kWh for traditional hydrogen systems and \$0.47/kWh for lithium-ion batteries. This cost efficiency, combined with the ability to produce low-cost green hydrogen (~\$4/kg before incentives), provides a significant competitive advantage.

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## Core Technology

### Technology Description

Fuel cells   Fuel cell, hydrogen production   Other energy storage technologies   Engineering  
High performance materials

Our core technology is the High-Temperature Proton-Exchange Membrane (HTPEM) Reversible Fuel Cell (RFC). This innovative system consolidates the functions of both an electrolyzer and a fuel cell into a single unit, allowing for both water electrolysis (hydrogen production) and hydrogen utilization (power generation). This dual functionality significantly reduces CAPEX costs by eliminating the need for separate systems, making it a cost-effective solution for long-duration energy storage (LDES) and green energy transitions.

Our HTPEM RFC technology is protected by two patent applications and leverages a novel conducting polymer that enhances the efficiency and durability of the electrochemical processes involved. This breakthrough allows our system to operate efficiently in various environmental conditions, providing a reliable and zero-emission energy solution.

Maturity in Sept. 19

TRL 9	Commercialization
TRL 8	Industrialization
TRL 6-7	Minimum Viable Product
TRL 5	Prototype
TRL 3-4	Experimental Proof of Concept
TRL 1-2	Scientific Validation
	Idea

#### Intellectual Property Valorization

First mover in your space  
Patent  
Secret

#### Competing Technologies

Li-ion Batteries  
Thermal Batteries  
Flow Batteries  
Compressed Air Storage  
Compressed CO2 Storage  
Iron-Air Batteries  
Gravity Storage

## Academic References

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Reference 1 : HyWatts Technical WhitePaper (<https://docsend.com/view/2uyjdnwb3raynri9>)

Written by a member of the team

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## Other References

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Reference 1 : article (<https://www.e-motec.net/powering-future-ev-charging-and-grid-breakthrough>)

Written by a member of the team

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Reference 2 : news article (<https://www.h2-view.com/feature/h2-view-introduces-hywatts/2113320.article/>)

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Reference 3 : news article (<https://evmagazine.com/charging-and-infrastructure/ev-revolution-wont-start-without-improved-infrastructure>)

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Reference 4 : news article (<https://www.pv-magazine.com/2024/11/19/us-startup-offers-reversible-fuel-cell-for-remote-locations/>)

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Reference 5 (<https://www.startus-insights.com/innovators-guide/new-fuel-cell-companies/>)

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## Patents

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Patent 1 : **REVERSIBLE HIGH TEMPERATURE PROTON EXCHANGE MEMBRANE FUEL CELL FOR PRESSURIZED STEAM HYDROGEN AND POWER PRODUCTION** (Ref: U.S. Provisional Patent Application Serial No. 63/542,958, filed October 5, 2023)

Patent ownership: Owned by your company

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Patent 2 : **MEMBRANE ELECTRODE ASSEMBLY FOR HIGH TEMPERATURE PEM FUEL CELLS AND WATER ELECTROLYSIS** (Ref: U.S. Provisional Patent Application Serial No. 63/542,963, filed October 6, 2023)

Patent ownership: Owned by your company

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## Market

### Industry Tags / Market Tags

Decentralized power generation (micro-grids, personalized energy)   Energy Storage  
Hydrogen/Fuel Cell (Renewables)   Infrastructure (Renewables)   Solar (Renewables)  
Decentralized power generation (micro-grids, personalized energy)   Electricity Transmission & Distribution  
Energy Storage   Energy Efficiency

## Markets

<b>Title</b>	EV Charging Stations
<b>Description</b>	<p>Our initial target customers are power-intensive industries such as EV charging stations and data centers. These markets were chosen based on extensive customer discovery and the alignment of incentives and subsidies, ensuring a strategic and scalable approach to market entry and growth.</p> <p>The market for Heavy-Duty Electric Vehicle Charging Infrastructure is projected to grow significantly, especially in areas with limited or no grid infrastructure.</p>
<b>Potential partners or clients</b>	<p>Customer Profile:</p> <ul style="list-style-type: none"> <li>• <b>Fleet CPO</b> (like TerraWatt, Greenlane, RedWolf, EINRide, etc.) - 60% of the portfolio. New constructions.</li> <li>• <b>Fleet Muni/Corp/Gov</b> (FedEx, UPS, Amazon, US Govt) + Airports - 40% of the portfolio (upgrade of the existing truck stops or existing areas of operation (e.g. warehouses)</li> </ul> <p>We have already secured 7 LOIs worth \$55M, with potential contracts valued at \$3B upon success. Two of them have already been converted into a paid feasibility study valued at approximately \$175,000.</p>
<b>Area</b>	North America, Europe
<b>Customer Focus</b>	B2B
<b>Time to Market</b>	< 6 months
<b>Potential Addressable Market</b>	\$1,200,000,000,000
<b>Total Addressable/Available Market</b>	\$150,000,000,000
<b>Serviceable Available</b>	\$41,000,000,000

**Market**

**Serviceable  
&  
Obtainable  
Market** \$9,500,000,000

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**Title** Data Centers

**Description** The data centers market, dominated by giants like Amazon, Microsoft, and Google, faces significant challenges due to rapid growth outpacing power infrastructure development. Key competitors include distributed data center companies like Cloudflare and Akamai, offering decentralized solutions. This explosive demand pressures traditional power grids, driving a push for energy-efficient technologies and renewable integration. As data proliferation continues, innovation in sustainable energy and resource optimization becomes crucial, with distributed players carving a niche by enhancing redundancy and reducing latency.

**Potential partners or clients** We have approached several companies and are engaged in ongoing discussions with potential partners and clients in the data center sector. Notably, we are in conversation with Texas Tech regarding the deployment of a prototype system at their green computing center. This initiative aims to accelerate our proof of concepts for the industry, potentially allowing us to enter the data center market more quickly. Additionally, we are discussing the potential collaboration with distributed data center developers like CENTRA.

**Area** North America, Europe

**Customer Focus** B2B

**Time to Market** 1 - 2 years

**Potential Addressable Market** \$1,200,000,000,000

**Total Addressable/Available Market** \$250,000,000,000

**Serviceable Available Market** \$40,000,000,000

**Serviceable & Obtainable Market** \$12,000,000,000

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<b>Title</b>	Energy Storage for Utilities
<b>Description</b>	HyWatts offers a unique and cost-effective solution for long-duration energy storage for utility companies, especially 24+ hours. Compared to competitors, HyWatts stands out due to its lower CAPEX for storage (\$40/kWh vs. \$100-300/kWh for alternatives). Additionally, our system's smaller footprint, greater temperature resilience, and lower water usage make it suitable for diverse environments.
<b>Potential partners or clients</b>	We are currently in active conversations with several utility companies, including Duke Energy, SoCal Gas, Pacific Gas and Electric, and eNel. These partnerships are crucial as they recognize the potential of our technology and are excited about its promise, even though they typically require a higher Technology Readiness Level (TRL) than we currently have.
<b>Area</b>	worldwide
<b>Customer Focus</b>	B2B
<b>Time to Market</b>	3 - 5 years
<b>Potential Addressable Market</b>	\$1,200,000,000,000
<b>Total Addressable/Available Market</b>	\$800,000,000,000
<b>Serviceable Available Market</b>	\$91,000,000,000
<b>Serviceable &amp; Obtainable Market</b>	\$30,000,000,000

## Business Model

### Business Plan

We plan to reach our target markets through a phased approach. Initially, we will target ZEV charging stations in rural areas, focusing on existing truck stops and new stations. By 2026, we will expand to data centers, warehouses, and community microgrids, and by 2038, we aim to enter the utility-scale storage market. We have already secured 7 LOIs worth \$55M, with potential contracts

valued at \$3B upon success. Our revenue model focuses on converting LOIs into paid feasibility studies (two already converted), B2B equipment sales, and long-term PPAs under the Energy-as-a-Service (EaaS) model. We aim to capture \$1B in revenue by 2030.

Market strategy

We plan to monetize our solution through a combination of B2B equipment sales for pilot projects and an Energy-as-a-Service (EaaS) model for full commercialization. Initially, we will sell equipment to capture most of the capital expenditure. As we move towards full commercialization, we will offer long-term Power Purchase Agreements (PPAs) with fixed prices per kilowatt-hour. This approach allows us to capture available incentives and rebates while providing low-cost energy. Our goal is to transition to the EaaS model by 2026, targeting various sectors such as EV charging stations, data centers, warehouses, and community microgrids.

Main distribution channel

- EV Charging Stations: Our main distribution channel will be through collaboration with dealers of EV-commercial vehicles, offering a turnkey solution that includes both the vehicles and the charging infrastructure from HyWatts. Additionally, direct cooperation with charging station operators and developers.
- Data Centers: Direct Sales to Data Centers owners and developers
- Utility Storage: Direct Sales to utility companies and their contractors.

Pricing

We are working on the project estimated at \$27M (12MW output and 150MWh storage) - \$40/KWh CAPEX installed for the energy storage based on our Reversible Fuel Cell System. This gives the electricity cost about \$0.11 per kWh.

Other Partnerships

Name	BASF
Description	HyWatts partnered with BASF in December 2023 to enhance renewable energy products using BASF's high-temperature proton exchange membrane, Celtec-Z. This collaboration focuses on developing improved membranes, catalysts, and electrolyte management solutions, as well as implementing high-volume manufacturing methods and new testing protocols.
Type	Business

Name	Sunbo Unitech
Description	In October 2023, HyWatts partnered with Sunbo Unitech to explore synergies between its reversible fuel cell system and Sunbo's advanced PEM water electrolysis systems for green hydrogen production. This

collaboration aims to integrate Sunbo Unitech's experience in Balance Of Plant into HyWatts' HTPeM Reversible Fuel Cell product designs.  
Business

Name	Black & Veatch
Description	We are in conversation with the company about Memorandum of Collaboration where B&V will be our EPC contractor for the projects we are working on.
Type	Business

Name	University of California Irvine
Description	To enhance hydrogen-based energy systems through collaborative research in electrolysis, fuel cells, and hydrogen storage systems. This partnership also includes efforts to secure grant funding, establish product specifications, and improve high-volume manufacturing methods and testing protocols.
Type	Research

Name	LDES Consortium
Description	"This involvement is aimed at driving innovation in long-duration energy storage solutions, leveraging hydrogen as a storage medium. The collaboration with the LDES Consortium is part of HyWatts' broader efforts to engage with government initiatives and industry groups to advance its technology and market reach."
Type	Industrial

Name	Arches H2 (CA Hydrogen Hub)
Description	"HyWatts has an active partnership with the ARCHES H2 Hub, which is part of their strategic efforts to drive innovation in the hydrogen sector. This collaboration is part of HyWatts' broader strategy to engage in government efforts and leverage key partnerships along the supply chain to advance their technology and market presence."
Type	Industrial

Economic Impact

HyWatts' innovation has a significant economic impact on key stakeholders by reducing capital expenditure (CAPEX) by 2x compared to current hydrogen technology and by 5x compared to Li-ion battery technology. This cost efficiency makes our solutions highly attractive for power-intensive industries, such as EV charging stations, data centers, and utilities. Additionally, our technology supports the development of community microgrids, providing reliable, low-cost on-site energy, which enhances community resiliency and accelerates economic development, particularly in regions with underdeveloped infrastructure.

Landscape

## Main competitors

Form Energy  
Energy Dome  
Plug Power  
ESS  
Antora  
Bloom Energy  
SunHydrogen  
Endua

## Competitive Advantages

HyWatts' competitive advantages are rooted in our unique technology and cost-effectiveness. Our HTPEM Reversible Fuel Cell system consolidates both water electrolysis and hydrogen utilization into a single unit, significantly reducing CAPEX costs compared to traditional systems that require separate electrolyzers and fuel cells. This innovation allows us to offer lower CAPEX and electricity costs, costing our system \$40/kWh compared to \$180-\$300/kWh for traditional batteries. Additionally, our system's physical footprint are smaller than competitors.

## Known Regulatory Issues

HyWatts faces several regulatory challenges, primarily related to the installation of hydrogen systems as part of larger construction projects. These installations require individual approval from local jurisdictions.

## How these issues will be managed?

To manage these issues, HyWatts supports the permitting process by providing necessary documentation to show adherence to pertinent standards such as ASME B31.3 Process Piping, ASME B31.12 2014 H2 Piping, ASME BPVC, and NFPA 853 Installation of Stationary Fuel Cell Power Systems. Additionally, for standardized sub-modules like the High Temperature Reversible Fuel Cell Stack, HyWatts will seek UL 1212-01 approval if they show high market potential.

## Risks

The main risks for HyWatts include engineering, market, human resources, and manufacturing challenges. Engineering risks involve potential delays due to resource and funding availability. Market risks are mitigated by adopting a multi-segment go-to-market strategy. Human resources risks focus on attracting and retaining top talent, especially during growth stages. Manufacturing challenges are managed by outsourcing non-core steps to handle complexity. Additionally, regulatory, political, and customer adoption risks are addressed through strategic partnerships, securing non-dilutive funding, and focusing on cost-competitive technology.

Traction

KPIs Showing Traction

<b>Name</b>	Applied research coupon reversible fuel cell cell validations - September 2023
<b>Value</b>	Validation of the core technology to unlock the reversible fuel cell concept
<b>Name</b>	DOD SBIR grant Award - February 2024
<b>Value</b>	\$15000
<b>Name</b>	DOE SBIR grant Award (Reversible Fuel Cell Development) - June 2024
<b>Value</b>	\$200000
<b>Name</b>	7 signed LOIs with customers (EV charging station developers for heavy duty trucks) - June 2024
<b>Value</b>	worth \$55M
<b>Name</b>	Commercial Feasibility with California City Industrial Park (power-plant-in-a-box™ for charging station) - July 2024
<b>Value</b>	\$80000
<b>Name</b>	Commercial Feasibility with L-Charge (power-plant-in-a-box™ for mobile charging station) - August 2024
<b>Value</b>	\$95000
<b>Name</b>	Pre-seed round Part 1 closed from investors - August 2024
<b>Value</b>	\$1M raised
<b>Name</b>	Submitted 2 patents applications - September 2024
<b>Value</b>	core IP defended
<b>Name</b>	MVP (grid-independent power source for Level 2 charger) ready to deploy - November 2024
<b>Value</b>	Validation of the technology and Business Model for EV Charging Station Market

Media Coverage

- [PV Magazine](https://www.pv-magazine.com/2024/11/19/us-startup-offers-reversible-fuel-cell-for-remote-locations/) (https://www.pv-magazine.com/2024/11/19/us-startup-offers-reversible-fuel-cell-for-remote-locations/)
- [H2 View](https://www.h2-view.com/feature/h2-view-introduces-hywatts/2113320.article/) (https://www.h2-view.com/feature/h2-view-introduces-hywatts/2113320.article/)
- [E-Motec](https://www.e-motec.net/powering-future-ev-charging-and-grid-breakthrough) (https://www.e-motec.net/powering-future-ev-charging-and-grid-breakthrough)
- [EV Magazine](https://evmagazine.com/charging-and-infrastructure/ev-revolution-wont-start-without-improved-infrastructure) (https://evmagazine.com/charging-and-infrastructure/ev-revolution-wont-start-without-improved-infrastructure)

Other signs of traction

<b>Name</b>	Techstars LA
<b>Type</b>	Acceleration/incubation program
<b>Name</b>	Plug and Play - energy innovation program
<b>Type</b>	Acceleration/incubation program
<b>Name</b>	Startup the Future Award - for the Pioneering Mobility Solutions (Galp & BMW Group)
<b>Type</b>	

Funding

Non Equity Funding

<b>Name</b>	DOE SBIR I
<b>Amount</b>	\$200,000
<b>Date</b>	2024-07-01
<b>Name</b>	DOD SBIR I
<b>Amount</b>	\$15,000
<b>Date</b>	2024-02-01
<b>Total</b>	\$215,000

Equity Funding

<b>Name</b>	Aloniq
<b>Type</b>	VC
<b>Name</b>	Climate Capital
<b>Type</b>	VC
<b>Name</b>	Techstars
<b>Type</b>	VC
<b>Name</b>	BuildTech VC
<b>Type</b>	VC
<b>Name</b>	Sunbo Angel Partners
<b>Type</b>	VC
<b>Total</b>	\$1,400,000

## Last round of funding

Pre-seed

## Next round of funding

**Next round of funding** In the next 6 months/year

**Next round amount** \$3,000,000

**Next round closing date** Jun 30, 2024

## Generating revenues


Yes


## Last year revenues

\$40,000

## Team

## Team qualifications

 Team Size 9

 Women among founders Yes

 C-level women No

Our team at HyWatts is highly qualified due to extensive experience, complementary skills, and a shared passion for hydrogen technology.

Alex Ivanenko, PhD in Electrochemistry, is a serial entrepreneur and former CEO of HyPoint (a manufacturer of H2 fuel cells for aviation, which ZeroAvia acquired for \$100M).

Sam Ruben, MBA/MPA, is an innovator and co-founder of Mighty Buildings, with experience in the World Economic Forum's G20 Sustainability Taskforce.

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## Key Team Members

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**Alex Ivanenko, CEO**

**in** LinkedIn profile (<https://www.linkedin.com/in/alexivanenko/>)

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**Sam Ruben, CBDO**

**in** LinkedIn profile (<https://www.linkedin.com/in/samruben/>)

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## Additional Information

### Social Media

**in** Company LinkedIn page (<https://www.linkedin.com/company/hywatts/>)

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