



## INVEST IN HEVO

# Wireless charging for electric vehicles

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### LEAD INVESTOR



**Jon Gensler** Angel Investor and Clean Tech Entrepreneur

I have known and worked with CEO Jeremy McCool since HEVO was barely a worm of an idea, and have been impressed almost every step of the way of this company's journey. My military veteran experience tells me HEVO's mission is critical. My MIT Sloan MBA and business experience tell me HEVO's solution is practical and yet magical. My daily driving and charging of various EVs over the past decade ensure me that HEVO's opportunity to be a meaningful leader in the ongoing EV revolution is undeniable. I have invested in this team nearly every round since the beginning, and plan on continuing to add to my position until HEVO stops asking.

Invested \$100,000 this round & \$100,000 previously

[Learn about Lead Investors](#)

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## Highlights

1

Wireless EV charging system meeting UL and SAE standards

- 2 Tier 1 agreement paves way for software installation on thousands of EVs
- 3 Robust IP portfolio featuring 21 patent families
- 4 Successful pilots with major global auto and energy companies
- 5 Efficient cost structure, significantly below all competitors
- 6 Revenue projected (not guaranteed) to exceed \$500M by 2027

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## Our Team



**Jeremy McCool** Founder & CEO

Connect on LinkedIn!



**Umer Anwer** CTO

Connect on LinkedIn!



**Victor Peltola** CCO

Connect on LinkedIn!



**Sameer Rashid** COO

Connect on LinkedIn!



**Sameer Rashid** COO

Connect on LinkedIn!

# **Certified Hardware & Software Wireless Charging Technology, Commercial Available Today**

HEVO's wireless charging technology meets the universal safety and performance standards for wireless EV charging developed by UL and the Society of Automotive Engineering (SAE). As a first-mover introducing a commercial-ready wireless EV charging platform featuring seamlessly integrated hardware and software, HEVO is well-positioned to dominate the rapidly expanding EV charging marketplace. This is evidenced by (1) a significant, recent investment from Obsidian Investment Partners; (2) a robust business development pipeline including multiple RFQs from major auto OEMs and Tier 1 auto suppliers; and (3) HEVO's selection as the exclusive commercialization partner for DOE-funded wireless charging technologies developed by Oak Ridge National Labs. HEVO's charging platform is designed to support the mass scaling and adoption of electric and autonomous vehicles by creating an exceptional user experience for drivers and fleets.

## **Problem: Plugin EV charging has critical limitations**

### **Competing connectors**

Plugin charging lacks a universal protocol, with many charging locations requiring more than three different connector types.

### **Fueling cost**

Pay-as-you-go chargers are often expensive, with opaque pricing structures; free charging is typically slow and over-utilized.

### **Fragmented networks**

There is limited interoperability between networks, requiring multiple accounts, apps, keycards, & RFID fobs to access and pay.

### **Limited scalability**

Plug-in charging does not easily scale with forecast global EV adoption, and is not suited for autonomous EVs.

## The bottom line:

Plug-in charging is a bottleneck for EV adoption and for the growth of the EV industry

## Solution: A wireless EV charging network

HEVO is building the global wireless charging standard for electric vehicles—providing users with a simple charging experience and a complete, integrated EV transportation app.

## Exceptional convenience

- ✓ Wireless chargers are universally adaptable
- ✓ HEVO chargers work seamlessly with any wireless charging equipped EV
- ✓ Charging hardware is compact, easy to install, and easy to maintain
- ✓ Customers never need to leave the car, increasing overall safety and comfort
- ✓ Mobile app integrates seamlessly with both wired and wireless charging networks

## Designed for scale

- ✓ Universal adaptability across all types of EVs
- ✓ Eliminates bulky wires, making it an ideal solution for dense urban zones
- ✓ Mission critical technology for the pending roll-out of autonomous EVs

## Highly cost-efficient

- ✓ Highly efficient cost structure, significantly below all wireless competitors
- ✓ Low maintenance costs, no external plugs that are susceptible to wear and tear
- ✓ Less reliance on expensive raw material inputs given wireless capabilities

In short, our wireless charging standard will enable us to create a durable, scalable network that supports widespread EV and autonomous vehicle adoption.

## Product: A complete hardware and software solution

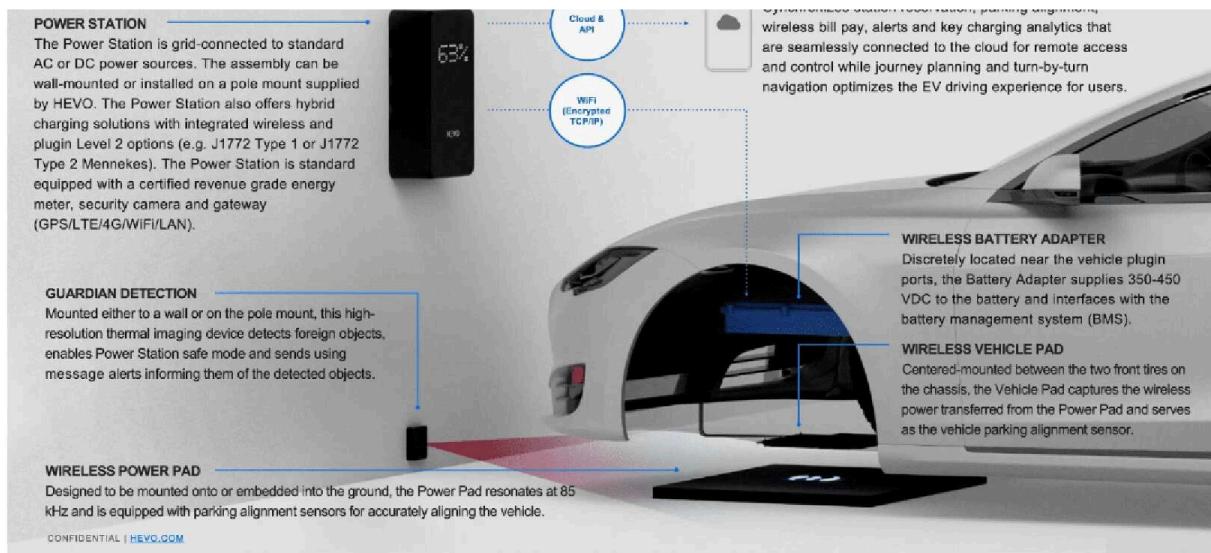


HEVO's core product is a hardware and software solution for electric vehicle charging called Rezonant E8. It's comprised of four main components:

- (1) Power station:** wall- or pole-mounted with the option to offer integrated wireless and plugin Level 2 charging (Level 2 charging stations plug into a 240V outlet - like a clothes dryer or oven - and deliver more power to the car to charge it faster)
- (2) Vehicle assembly (Wireless Battery Adapter and Wireless Vehicle Pad):** can be installed on any EV
- (3) Wireless power pad:** mounted onto or embedded into the ground
- (4) App and cloud platform:** synchronizes parking alignment, bill pay, charging analytics, and other key user services

[Introduction: HEVO Wireless Equipment and Full-Stack Software](#)

APP & CLOUD  
Synchronizes station reservation, parking alignment



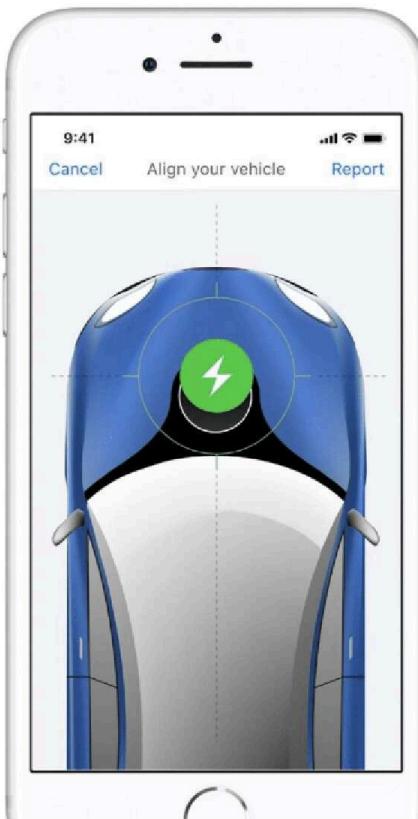
HEVO's software product for end users also works like a replacement for Maps and Waze, and includes route planning, pricing, reservations, and other travel features. This integrated approach allows us to build our user base and community, acting as a lead generation tool.

## A seamless user experience

### Turn-by-Turn Navigation



### Wireless Charging Ready





EV specific mapping and turn-by-turn navigation with route planning, pricing, reservations, filters and other features offered exclusively by HEVO



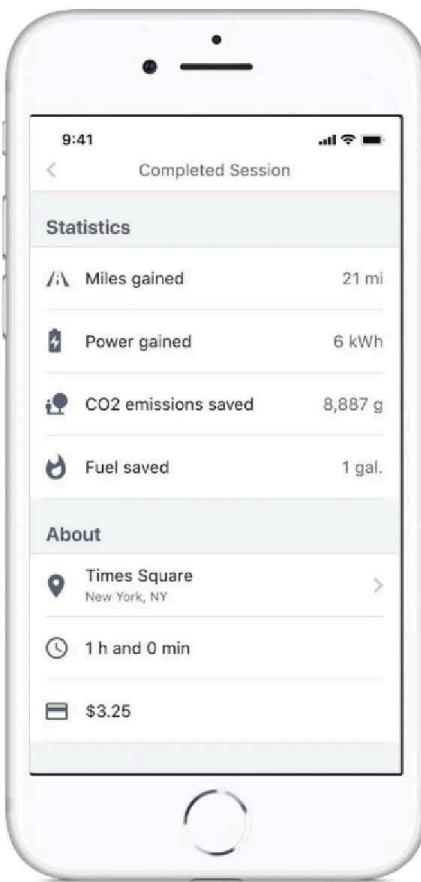
Built with the future in mind, this app is ready with wireless charging parking alignment assistance and features that complete the hands-free experience

## Remote Access and Operability



Remotely start and stop the charging process while accessing real-time charging data like state-of-charge, power input and charging costs on the fly

## Account Management



Effortlessly add vehicles, payment options and manage charging networks with wirelessly bill pay options, receipts and remote access to your charging statistics

**IOT-ENABLED 1**  
Network connected with GPS,

**4 WEB CONNECTED CAMERA**  
In-built camera for added security,

WiFi, LTE and Ethernet options for remote management, proactive analytics, over-the-air updates and interconnectivity with other EV charging apps via the HEVO API

## MULTI-PAYMENT OPTIONS 2

Pay-as-you-go and membership customers can start charging by using their mobile app, tapping their security chipped cards, mobile pay or by phoning in

## BUILT-IN 3 ENERGY METER

Certified revenue-grade energy meter enabling real-time payments for electricity and end-to-end efficiency management



parking site management, wireless charging alignment assistance and reservation management

## 5 UV SAFE LED DISPLAY

1-million-hour life and 1.6M color RGB spectrum visible from distances up to 40 feet and 120 degree viewing angles in direct sunlight that provides key charging details like availability, pricing and charging statistics

## COMPETITIVELY 6 PRICED

Cost competitive with Level 2 chargers even without financing

## 7 LEVEL 2 PLUGIN CHARGING OPTION

Option to include a wired port or cable to service non-wireless drivers

10

## JOURNEY PLANNING

UX/UI key features including trip planning, booking management, payments and sophisticated range estimation algorithms



## 9 NETWORK MANAGEMENT

Network OS manages integration, booking, security, authentication,

## SMART-EST 8 EV CHARGING

Web and mobile apps display

nignly valuable insights during charging that are not readily available by other EV charging software platforms (e.g. state of charge, costs during usage, charge time remaining, upcoming reservations, etc.)

and back office reconciliation

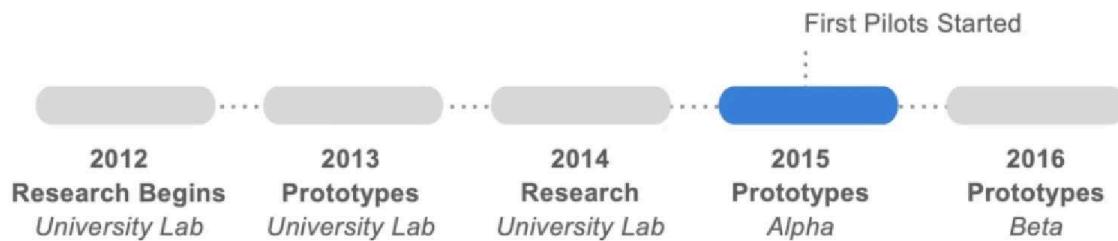
## Traction: Significant traction with OEM manufacturers and Tier 1 suppliers

### Completed pilots

The company has completed several pilot projects with leading multinational companies. They have either executed or are finalizing formal agreements with global automakers and Tier I auto industry suppliers—creating a potential path for the Company’s platform to become the industry standard for hundreds of thousands of EVs.

Manufacturing and shipment of the company’s commercial product commenced in 2021, and management is preparing to scale production beginning in 2022. Company revenue projections exceed \$500M by 2026 (projections cannot be guaranteed).

### Technology timeline



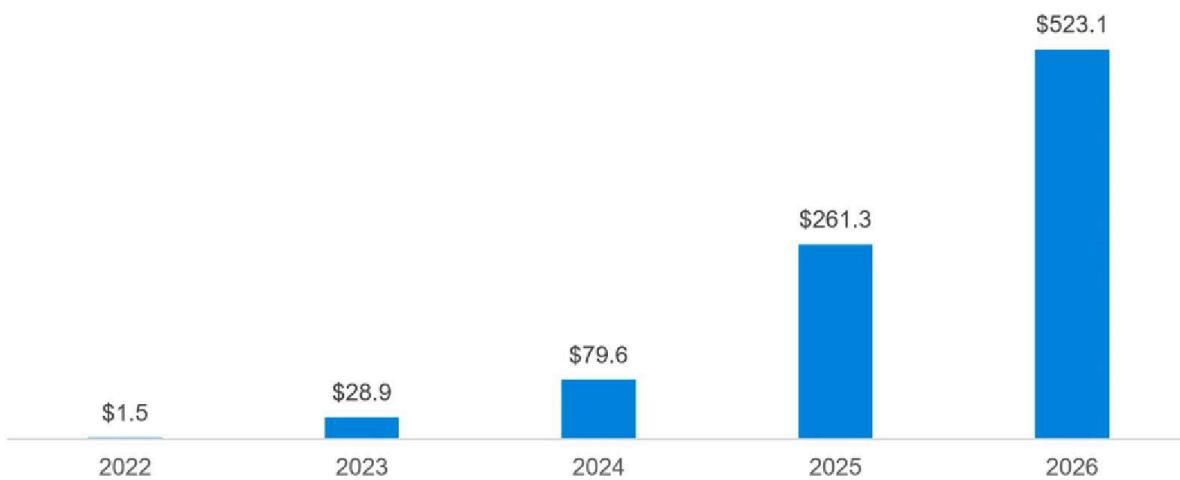
Becomes First Safety Certified and Auto Qualified Wireless EV Charging Technology in the World

2017 Pilots & Refinement	2018 Pilots & Refinement	2019 UL & SAE Testing Kickoff	2020 SAE Qualification UL Certification ISO Certification	2021 Brooklyn Micro Factory (small-batch serial production)
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## Financial overview

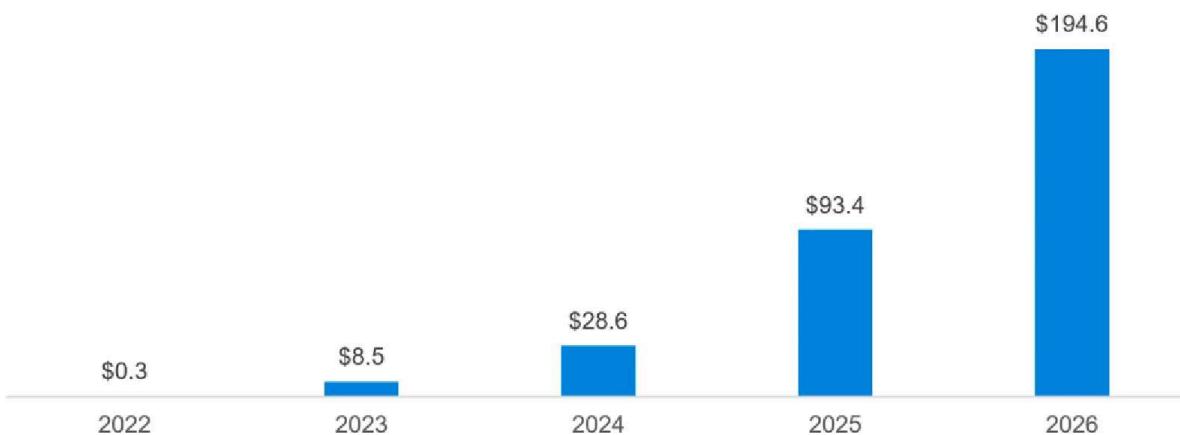
We believe HEVO is on path for accelerated revenue and EBITDA generation through its unique business model and state-of-the-art products.

### Revenue (\$MM)



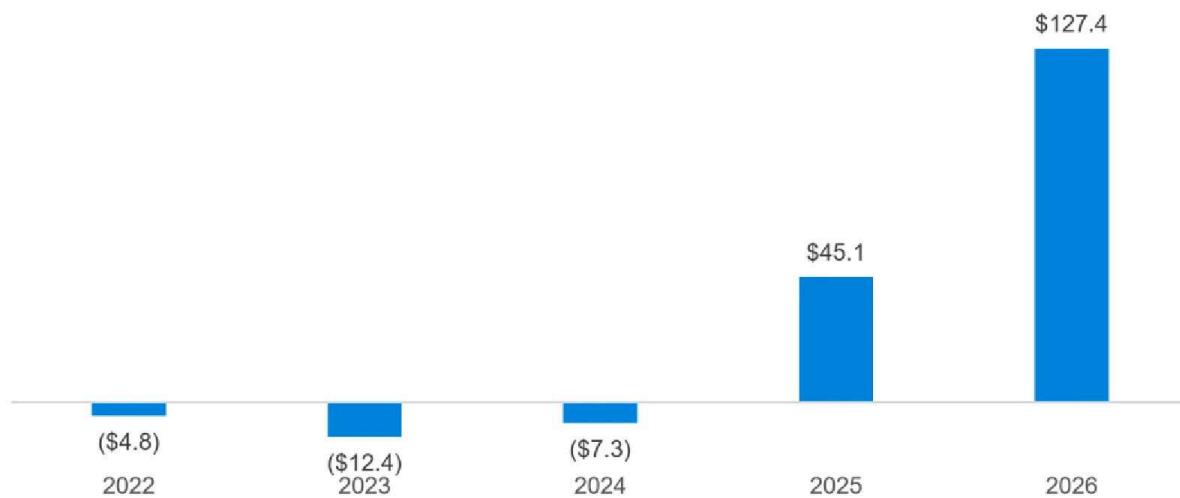
*Future projections, including related to revenues and expenses, cannot be guaranteed.*

### Gross Profit (\$MM)



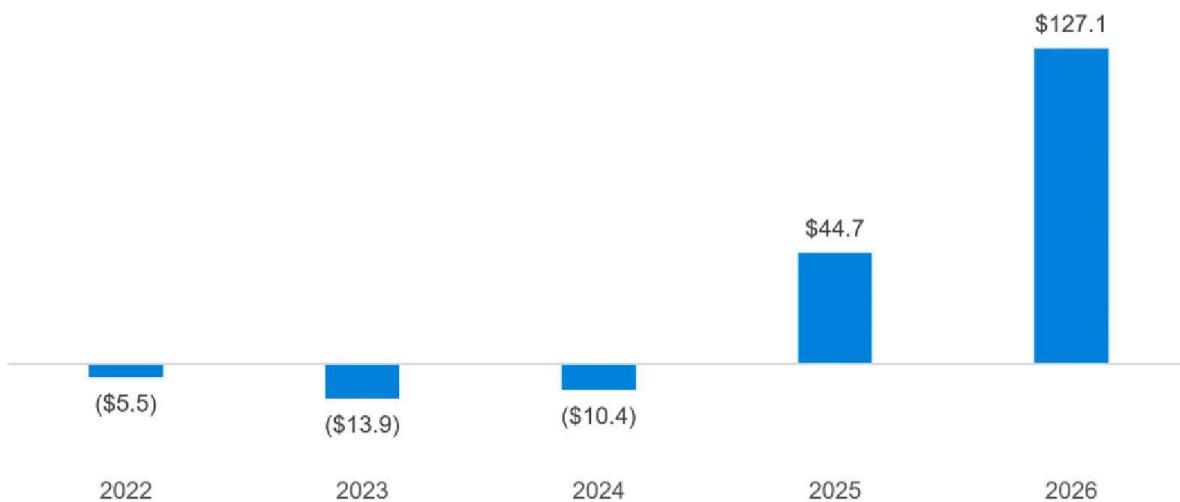
*Future projections, including related to revenues and expenses, cannot be guaranteed.*

#### EBITDA (\$MM)



*Future projections, including related to revenues and expenses, cannot be guaranteed.*

#### EBITDA - CAPEX (\$MM)



*Future projections, including related to revenues and expenses, cannot be guaranteed.*

## Income statement

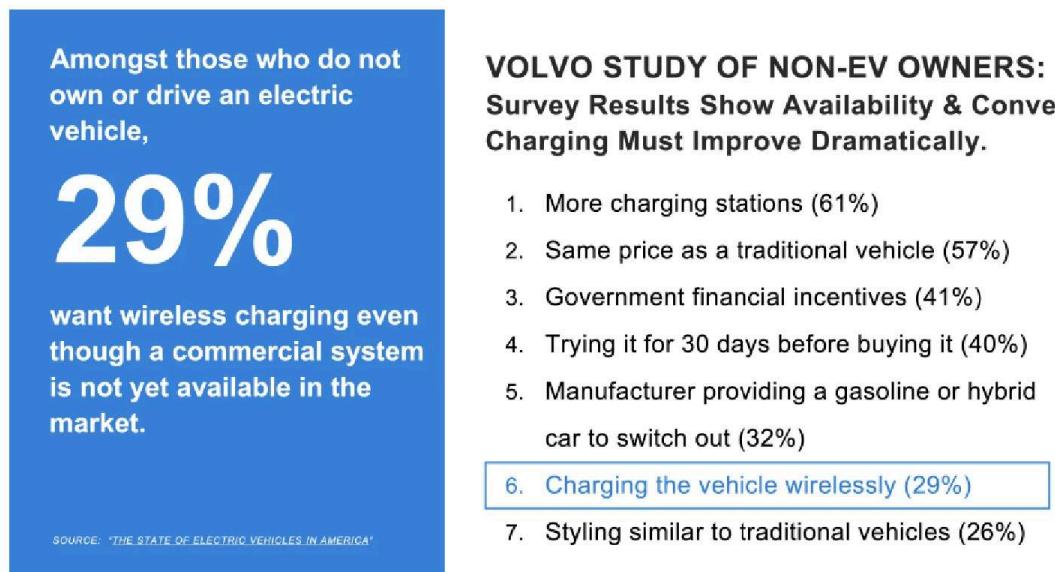
	2022 (\$MM)	2023 (\$MM)	2024 (\$MM)	2025 (\$MM)	2026 (\$MM)
Total Revenue	\$1.5	\$28.9	\$79.6	\$261.3	\$523.1
(-) Total COGS	(\$1.2)	(\$20.4)	(\$51.0)	(\$168.0)	(\$328.5)
Gross Profit	\$0.3	\$8.5	\$28.6	\$93.4	\$194.6

(+) Grant Income	\$0.1	\$0.5	\$0.8	\$1.0	\$1.3
(-) Total Expenses	(\$5.2)	(\$21.3)	(\$36.7)	(\$49.2)	(\$68.5)
<b>EBITDA</b>	<b>(\$4.8)</b>	<b>(\$12.4)</b>	<b>(\$7.3)</b>	<b>\$45.1</b>	<b>\$127.4</b>
(-) Depreciation & Amortization	(\$0.1)	(\$0.3)	(\$0.7)	(\$1.2)	(\$1.2)
<b>EBIT</b>	<b>(\$4.9)</b>	<b>(\$12.7)</b>	<b>(\$8.0)</b>	<b>\$44.0</b>	<b>\$126.1</b>
(-) Interest Expense	(\$0.0)	—	—	—	—
(-) Taxes	—	—	—	(\$5.5)	(\$37.8)
<b>Net Income</b>	<b>(\$5.0)</b>	<b>(\$12.7)</b>	<b>(\$8.0)</b>	<b>\$38.5</b>	<b>\$88.3</b>

*Future projections, including related to revenues and expenses, cannot be guaranteed.*

## Customers: Addressing an unmet need in the EV charging market

The pathway to mass adoption of EVs and the accompanying significant reduction in CO2 emissions is a simple, frictionless EV driver experience.



## Fleets

Fleets represent a significant near-term opportunity for the company. HEVO is actively engaging with taxi, delivery, public transportation, rental and other fleets for the aftermarket retrofit of vehicle assemblies and deployment of wireless charging stations.

## Certified Partners

Our certified partners are the installers of EV charging infrastructure for charging networks in the US, EU and Australia. Certified partners purchase EV wireless charging systems from HEVO wholesale, and then sell those systems retail to their customers. Please see the business model section for additional information.

## Automakers

HEVO is in the RFI/RFP process with multiple global automotive OEMs and Tier 1 automotive suppliers. HEVO's goal is to nurture these relationships and pave the way for HEVO's wireless charging vehicle-side equipment to be factory built into multiple EV makes and models.

## E-Commerce

Working with dealership networks, HEVO will eventually offer an aftermarket retrofit solution to any EV driver that wants to go wireless.

## Business model: OEM lease and subscription recurring revenue opportunity

## B2B model for fleets and customers

While EV drivers and fleets are the ultimate end-users of HEVO products, our direct customers are our certified distributors and Automotive OEMs.

HEVO is partnering with leading OEMs to develop a unique leasing program that will enable EV buyers to lease HEVO equipment directly from the manufacturer with no upfront costs.

## Lease program overview

1

HEVO chargers will be offered directly through OEM's as a factory-installed option on new battery electric vehicle ("BEV") sales. Rather than charging the customer upfront, the cost of the wireless charging hardware can be financed through a leasing option

2 This program will be fully funded by a third-party strategic capital provider, who in return will receive a portion of the monthly lease payments. This will enable the OEM to offer HEVO's wireless charging products with no upfront costs

3 HEVO will train OEM technicians at participating dealerships and mechanic shops on hardware installation and maintenance in order to provide best-in-class service and ongoing product support throughout the duration of a customer's lease

5 Purchasers of new BEVs will have the option to receive fully-installed HEVO wireless chargers as a factory option at no upfront cost, along with a subscription to HEVO's public charging network

6 The monthly lease payments will be used to provide a return to the strategic capital partner, a revenue share for the participating OEM, and to cover the costs of HEVO's charging hardware and associated installation costs

## Lease program benefits

✓ **Leases can be structured to match the lease term of new vehicles**

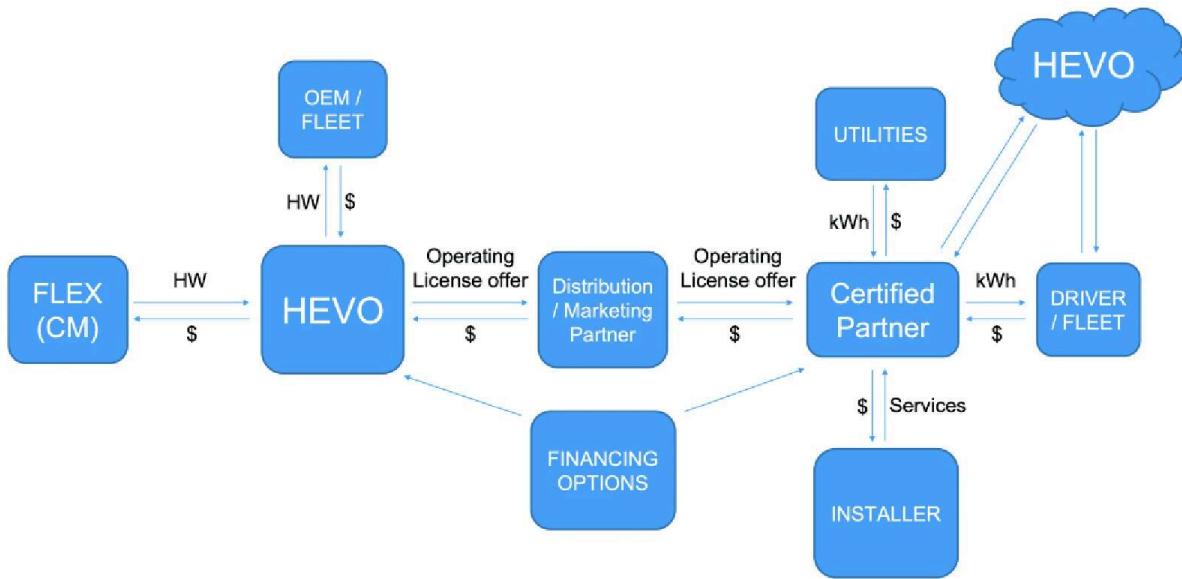
✓ **Fully-financed lease option with no upfront costs to the customer or OEM**

✓ **Trained HEVO technicians provide product installation and ongoing support throughout the life of the lease**

✓ **Instant access to HEVO's public charging network enhances network utilization**

✓ **OEM's participate in a revenue share of all leases sold**

## "Certified Partner" business model mitigates uncertainty and reduces risks



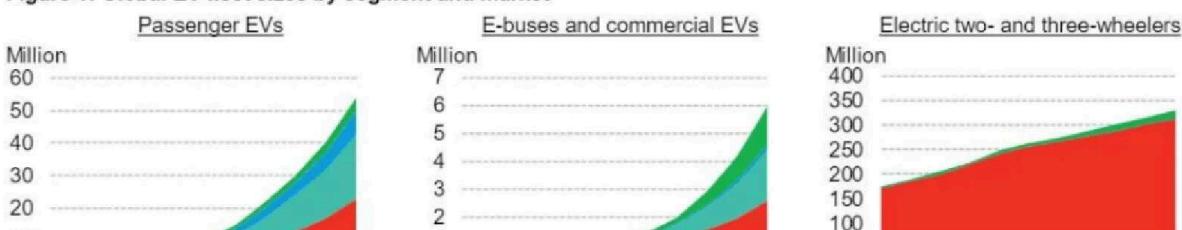
## Market: Wireless charging market analysis

### \$50B EV charging infrastructure opportunity by 2030

*"Representing an estimated \$50 billion of cumulative capital investment through 2030. On average, a level 2 charger used in a home costs less than \$1000; one used in a workplace or in public can cost between \$3000 and \$5000. A DCFC starts at about \$25,000 and, depending on the power capacity, can rise to more than \$200,000 for each unit."*

- ["Charging Ahead: Electric Vehicle Infrastructure Demand"](#) (McKinsey & Company)

Figure 1: Global EV fleet sizes by segment and market



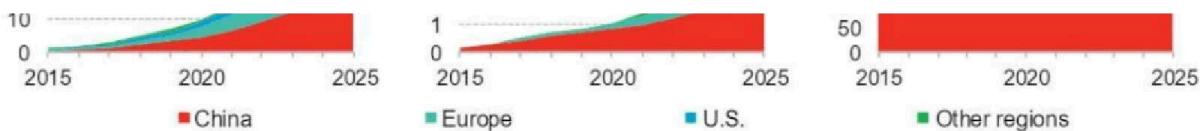
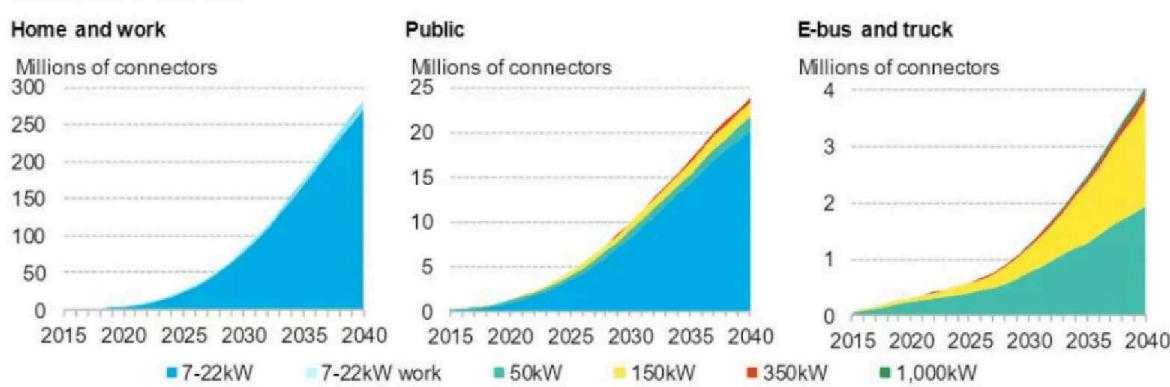


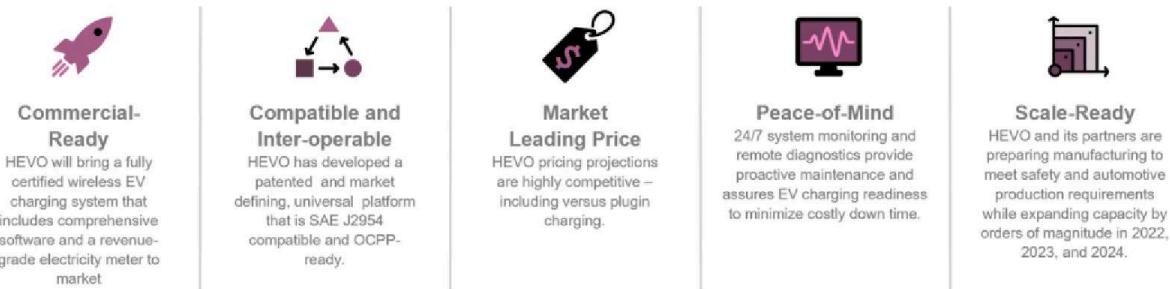
Figure 24: Cumulative global installed charging infrastructure by category: home and work, public, commercial – Economic Transition Scenario



## Wireless vehicle charging TAM

Based on HEVO's involvement in the RFI/RFQ process with multiple OEMs and Tier 1s regarding wireless charging integration, HEVO estimates that more than 2 million EVs will have SAE J2954 approved wireless hardware installed by 2025. HEVO expects the number of EVs with wireless hardware installed to greatly exceed 10 million by 2030, and approach 50 million by 2035.

## Competition: Positioned to become a global leader of wireless EV charging



HEVO introduced a certified, commercial-ready product and software platform. We began shipping certified units in mid-2021.

In January 2020, HEVO successfully tested below the required EMI-EMF

thresholds set by the then newly established SAE J2954 (global wireless EV charging standard).

In August 2020, we completed UL 2750 certification, the required global safety certification for any commercializing SAE J2954 technology.



## Commercialization requirements for wireless EV charging

Company	HQ Location	Development Start Date	Status	Commercializing Requirements for Wireless EV Charging							
				SAE J2954 Qualified	UL 2750 Certified	IATF 16949	ISO 9001	OCPP Compliant	ISO 15118	Software Platform	Plugin Add-On
	Brooklyn (2013-Present)	Dec 2012	Low-volume Serial Production	Yes	Yes	Compliance Pending 2023	Certification Pending 2022	OCPP 1.6	Pending	Yes	Available
KAIST	Daejeon, S. Korea	2010	Prototyping	No	No	Not Available		No		No	Not Available
LUMEN	Victoria, Australia	Qualcomm Halo Licensee	Commercializing	No	Yes	Likely Pending		No		No	Not Available
MOJO	Santa Clara, CA	2012	Prototyping	No	No	Not Available		No		No	Not Available
MOMENTUM	Malvern, PA	2012	Fleet demos	No	No	Not Available		No		No	Not Available
WAVE	Salt Lake City, UT	2012	Bus demos	No	No	Not Available		No		No	Not Available
WITRICITY	Watertown, MA	2007	Licensing lab designs	No	No	Not Available		No		No	Not Available
PLUGLESS POWER	Richmond, VA	2009	Dormant	No	No	Not Available		No		No	Not Available

Note: based on publicly available information.

**SAE J2954:** International and universal standard for interoperability and safe operation of wireless EV Charging.

**UL 2750:** International and universal safety certification for wireless EV charging production, marketing and sales.

**IATF 16949:** International certification for automotive quality management systems required to sell and distribute automotive grade equipment.

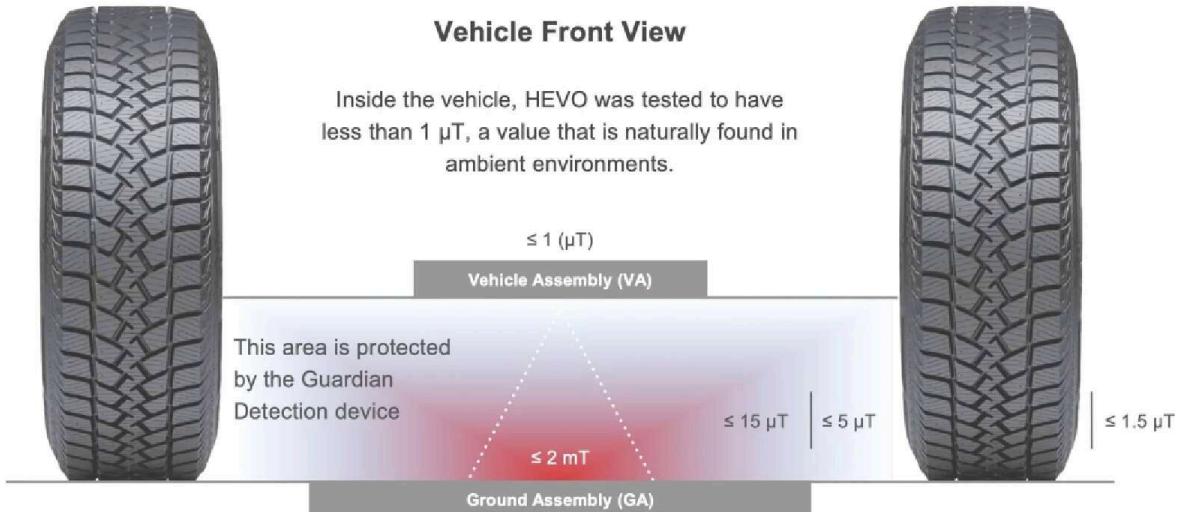
**ISO 9001:** International certification for automotive quality management systems required to sell and distribute automotive grade equipment.

**OCCP**: International communications protocol and certification for EV charging infrastructure back office communication standardization.

**ISO 15118**: International communications protocol and certification for EV charging infrastructure to grid communication standardization.

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**HEVO met the SAE J2954 requirements in January 2020**



## SAE J2954 Tested Electromagnetic Field Measurements

**1.5 ( $\mu$ T)**



SAE J2954 permits a maximum of 15 microtesla ( $\mu$ T) around the periphery of the vehicle wheelbase. HEVO tested 10x below by an SAE selected laboratory in January 2020.

Created in January 2012, SAE J2954 is a task force of over 100 members comprising of major automakers, Tier 1 suppliers, energy companies, EV charging companies and developers of wireless electric vehicle charging (WEVC) technologies that are responsible for the development and approval of a single, unified global wireless power transfer (WPT) standard. In January 2020, HEVO successfully tested SAE J2954 interoperability with a WPT competitor, while also successfully testing below the threshold limits of the SAE approved standard for electromagnetic field (EMF) and electromagnetic interference (EMI) at an SAE J2954 selected testing laboratory in Austin, TX. In 2020, the SAE J2954 task force shall publicly publish the standard, for which HEVO shall be referenced as a conforming technology.

## August 2020: HEVO completes UL 2750 certification testing for their introductory product – REZONANT E8



UL 2750 is the required global safety certification for any commercializing SAE J2954 technology. All wireless electric vehicle charging (WEVC) products must undergo UL 2750 testing to meet universally accepted electrical, environmental and fire safety standards. UL 2750 certifying tests are performed at Nationally Recognized Testing Laboratories (NRTLs) to ensure the highest level of analysis in examining the performance and durability of WEVC technologies. Upon successful completion of testing at the NRTL facilities, the WEVC production facility and assembly process must also be audited by UL officials to ensure the quality of manufacturing and conformity to UL requirements before being awarded the UL certification. Upon achieving the certification, UL officials will continue quarterly unannounced audits of the production facilities and manufacturing process in order to ensure UL 2750 conformity through the lifecycle of the WEVC product. In 2020, HEVO became one of only two companies in the world to complete UL 2750 testing for WEVC.

## Intellectual property protection

Patent Title	Coverage	Status	Priority Date	Approval Date	Expiration
Systems and Mobile Application for Electric Wireless Charging Stations	United States	Approved	March 23, 2012	October 24, 2017	20 Years
Inverter Enclosure	United States	Approved	October 21, 2016	March 27, 2018	March 27, 2033
Detecting and Deterring Foreign Objects and Living Objects at Wireless Charging	United States	Approved	May 01, 2017	November 13, 2018	May 01, 2037
Resonant Inverter Topology, Wireless Charger and Control Method	United States	Approved	February 19, 2014	August 13, 2019	March 09, 2036
Parking Alignment Sequence For Wirelessly Charging An Electric Vehicle	United States	Approved	October 21, 2016	August 06, 2019	October 21, 2036

## Wireless EV charging presents significant cost advantages to wired systems

### Plug-in vs. wireless cost and efficiency comparison

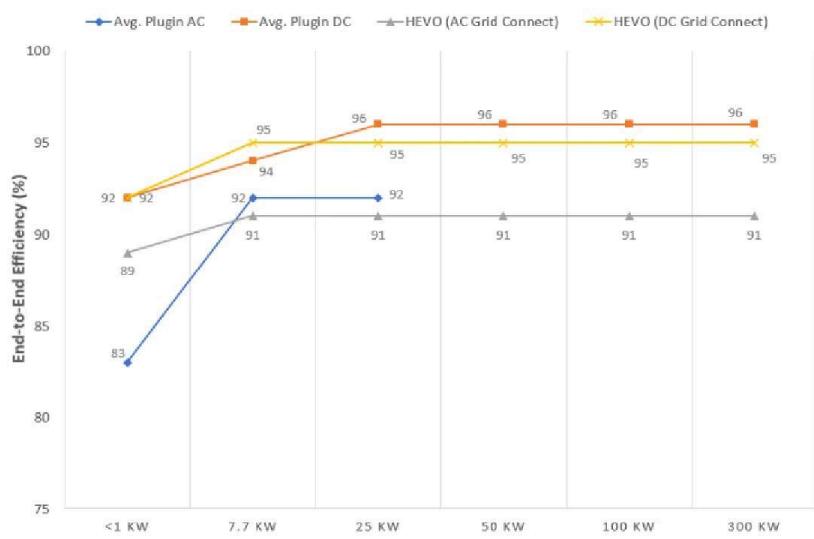
Plug-in System <sup>2</sup>					Wireless System	
System Power (kW)	Avg. Price (USD)	Avg. Price/kW (USD/kW)	Target Price (USD)	Target Price/kW (USD/kW)		
6.6 – 11	500 – 2,275	75 – 284	2,275*	284*		
25	7,500 – 10,000	300 – 400	10,000	400		
50	17.5k – 35.8k	350 – 716	20,000	400		
100	36k – 100k	360 – 1,000	35,000	350		
300 – 400	48k – 150k	137 – 429	50,000**	143**		

1. OEMs are focused on per-unit pricing of \$2,500 or less  
2. Market research

\*Price and Price/kW apply to 8kW wireless system  
\*\*Price and Price/kW apply to 300kW wireless system  
\*Wired data [source](#)

## Efficiency comparative analysis (grid-to-battery)

### Efficiency Comparative Analysis (Grid-to-Battery)



## Our Vision: Be the global unifying network for interoperable, ubiquitous EV charging

In 2022 we aim to:

- Relocate HQ to >10x size of Brooklyn facilities
- Launch the Journey app
- Engage 2-5 auto OEMs and/or Tier 1s on internal projects or tech review for future factory built-in wireless solution
- Engage in 2-5 fleet projects or tech review for large follow-up orders
- Secure 2-5 aftermarket distributor agreements for fleet/consumer wireless solutions
- Recruit up to 15 new personnel for ops, engineering, BD
- Certify and commercialize 11kW system and pre-certify 25kW and V2G

platforms

## Go-to-market strategy

### PHASE 1 2020-2021

#### TRACTION

- Rezonant E8 production hard tooling ordered and setup for mass production quantities
- Introduction of Rezonant E8 (Gen 1) and open aftermarket pre-purchasing by end of 2020 for first 142 certified units to be delivered in 2021
- HEVO Mobile App released on iOS and Android OS stores mid-2021 prior to delivery of first commercial systems
- First batch of UL and ISO 9001 certified units shipped for installation in 3Q 2021
- 2021 and beyond production quotas set with pre-purchasing opened for next ~2,000 units by 2022
- Aftermarket sales expansion into new regional markets in U.S., Europe and APAC

### PHASE 2 2021-2023

#### GROWTH

- Introduction of Rezonant E8 and E24 next generational products for aftermarket sales in all regions
- IATF 16949 certification obtained and first automaker order received with PPAP requirements
- Financing options opened for aftermarket fleet and consumer in specific markets
- In-network subscription models released for commuters and fleets with monthly and annual pricing models in the U.S. market
- Business development and sales expansion into new regional U.S., Europe and APAC markets

### PHASE 3 2023-2025

#### TRANSITION

- Introduction of Vehicle-to-Grid technologies for aftermarket and automaker option sales in all global locations
- First OEM production vehicles with HEVO wireless technology publicly released
- Project financing expanded into new regional and international markets
- In-network subscription models released for commuters and fleets

### PHASE 4 2025-2030

#### CONSOLIDATION

- Introduction of Dynamic Charging (Gen 1) for specified projects targeting fleets
- Over 33% of new production vehicles are equipped with HEVO wireless technology
- Project financing expanded into new regional and international markets
- Business development and sales expansion into new regions

- with monthly and annual pricing models in specific markets
- Business development and sales expansion into MEA and South American markets

## Applications for HEVO's unique creativity and passion

- Automation of business models and use cases such as route planning and dynamic charging travel lanes
- Seamless integration with autonomous vehicles and renewable energy for optimized grid management
- Increase EV adoption by disabled and senior drivers potentially hindered by heavy cables and cords
- Opportunistic route charging for buses, taxis and fleets improves air quality and optimizes grid utilization

## \$12.4M raised to date

HEVO has raised \$12.4M to date, with approximately \$10.0M in dilutive equity capital and \$2.4M in grant funding. We've raised capital from numerous notable investors and donors, including Veteran Affairs Award, NYSERDA Award, and the CyCLE Award.

## Funding milestones

### FUNDING MILESTONES

Total Investment: Approx. \$10.0M

Total Grants Received: Approx. \$2.4M



## Veteran-founded



Following a 15-month tour in Baghdad as a U.S. Army officer, Jeremy McCool



**Jeremy McCool**  
Founder & CEO

U.S. Army Officer, Jeremy McCool made a personal pledge to reduce global dependence on foreign and fossil fuels. Upon exiting the military, Jeremy entered Columbia University's School of International and Public Affairs (SIPA) and completed his MPA with a focus in urban policy and sustainability. During his final year at Columbia, Jeremy founded HEVO in November 2011, with the vision of creating the global standard for universal and ubiquitous