



GEMINI MOTOR COMPANY

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Gemini Motor, Ballard Power Systems, and Chart Industries Sign Joint Development Agreement to Develop Liquid Hydrogen Fuel Cell Class 8 Trucks

The overall system integration will transform the logistics industry by accelerating decarbonization and significantly reducing operational costs.

[December 13, 2020] Los Angeles, CA – Gemini Motor Company, Chart Industries, and Ballard Power Systems entered into an agreement to collaborate on the development of a zero-emission fuel-cell Class 8 autonomous vehicle that will be able to cover 1,000 miles in one fueling, dramatically reducing operating costs for the clean, long-haul transportation industry.



According to Alex Rafiee, **Gemini's** CEO, "Both Ballard and Chart are the industry leaders in their sectors, and we are confident our integrated solution will be a significant step forward for the industry."

This range breakthrough is possible due to the high energy density of **liquified hydrogen** and the ability to store it on-board Gemini's specially designed trucks. Liquid hydrogen has higher energy density than its gaseous form typically compressed at 350 and 700. Cryogenic tanks that store liquid hydrogen can operate at atmospheric pressure, which makes them inherently safer for transport and more efficient in achieving longer driving ranges while maintaining an optimal gross vehicle weight.

The benefits of fueling liquid hydrogen from a refueling station to a liquid hydrogen on-board tank include removing prohibitive cost burdens and allowing ultra-fast refueling times on parity with diesel. Onboard storage tanks streamline the dispensing process by eliminating the need for compression and, as a result, remove prohibitive capital and operational costs associated with compressors.

In addition to the significant reduction in carbon emissions from the use of liquid hydrogen and the unique design, Gemini plans to, over time, introduce an autonomous model of the same vehicle with increased space for additional fuel and additional efficiency from AI-directed operations that will extend the range up to 1,400 miles.



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Along with Gemini Motor's recent agreement with a green hydrogen provider for low-cost liquid hydrogen, the development of this platform is poised to move deliberately toward a low-cost, efficient goods-movement future. Gemini will provide customers with a "Transportation-as-a-Service" model, including a plan for first rollout of test vehicles and demonstration fleets in 2023. After successful trials, the company intends to work on the launch of Gemini Motor's commercial service with hundreds of vehicles by 2025.

Chart Industries, Inc. is a leading independent global manufacturer of highly engineered equipment servicing multiple applications in the Energy and Industrial Gas markets.

Ballard Power Systems delivers fuel cell power for a sustainable future of our planet. Ballard zero-emission PEM fuel cells are enabling electrification of mobility, including buses, commercial trucks, trains, marine vessels, and stationary power generation.

In the first phase of the collaboration, Gemini will integrate Chart's liquid fuel on-board storage systems and Ballard's advanced FCmove™ fuel cell in a class 8 vehicle to validate a multi-component integration system. Gemini intends to demonstrate a vehicle with an unprecedented zero-emission range suited for long haul logistics in countries such as US, Canada, and Australia. At commercial scale, Gemini seeks to operate thousands of such vehicles in a hub-to-hub model across multiple cities and provide transportation-as-a-service business to shippers and carriers.

Ballard fuel cells currently power approximately 3,500 buses and trucks, providing zero-emission mobility solutions in nearly a dozen countries around the world with more than 100 million combined zero-emission kilometers driven. There is no other fuel-cell system provider with more heavy-duty on-the-road miles than Ballard, proving the extraordinary maturity and durability of their solution.

"We are excited about this agreement as it represents extensive consideration and collaboration regarding partners. To accelerate decarbonization of the transportation sector, driving range is key. With longer ranges, the number of fuel stations needed drops exponentially while utilization of every unit rises, hence accelerating the adoption of zero emission transport. We achieve this long driving range with Ballard's powerful fuel cells combined with the unique liquid hydrogen tank storage from Chart," said Rafiee.



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Ballard's mission is to deliver fuel-cell expertise toward valuable and innovative solutions globally. "We consider agreements like the one with Chart and Gemini critical to advancing clean and innovative transportation. Both Gemini and Chart align with Ballard's company values and have the right mix of talent, innovation, and know-how to make great strides in this space," stated Marc Niefer, General Manager, Business Unit Trucks and Vice President Customer Care of Ballard.

Chart Industries is a global leader in the design, engineering, and manufacturing of process technologies and equipment for the Nexus of Clean™ -- clean power, clean water, clean food, and clean industrials, regardless of the molecule. While Chart services a global, diverse set of end markets, their reputation for quality, excellence in ESG, and forming strategic partnerships is well-known. "At Chart, we're proud to be at the forefront of the clean energy transition, and we're excited to team up with two industry leaders, Ballard and Gemini, to accelerate decarbonization in the long-haul trucking space," said Jill Evanko, CEO of Chart Industries.

About Gemini Motor

Los Angeles, California-based Gemini Motor is a cleantech company building zero-emission semi-trucks powered by hydrogen fuel cells. Gemini will operate a fleet of autonomous and non-autonomous Class 8 trucks in a hub-to-hub model and provides transportation-as-a-service to its clients. Gemini RoboTruck will have a range of up to 1,400 miles and can be refueled in less than 20 minutes. For more information, visit www.geminimotor.com.

About Ballard

Ballard Power Systems' (NASDAQ: BLDP; TSX: BLDP) vision is to deliver fuel cell power for a sustainable planet. Ballard zero-emission PEM fuel cells are enabling electrification of mobility, including buses, commercial trucks, trains, marine vessels, and stationary power. To learn more about Ballard, please visit www.ballard.com.

About Chart

Chart Industries, Inc. is a leading independent global manufacturer of highly engineered equipment servicing multiple applications in the Energy and Industrial Gas markets. Our unique product portfolio is used in every phase of the liquid gas supply chain, including upfront engineering, service, and repair. Being at the forefront of the clean energy



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transition, Chart is a leading provider of technology, equipment and services related to liquefied natural gas, hydrogen, biogas and CO2 Capture amongst other applications. We are committed to excellence in environmental, social, and corporate governance (ESG) issues both for our company as well as our customers. With over 25 global manufacturing locations from the United States to China, Australia, India, Europe, and South America, we maintain accountability and transparency to our team members, suppliers, customers, and communities. To learn more, visit www.chartindustries.com.



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