ENERGY INDUSTRY INSIDER

Q2 2020 Pulse
Electric Vehicle Charging Infrastructure

FutureBridge

WHAT'S INSIDE!

- HEVO is providing a key technological solution for Wireless Charging
- Portable or mobile charging solution now days are gaining attention in the market to provide faster and reliable solution
- EV charging companies are strategically partnering with technology providers
- Impact of Covid-19 on Electric Vehicle charging infrastructure

01 Emerging Trends

OEMs continue to partner for EV charging

Daimler AG plans to invest in Farasis Energy's planned $480 Million IPO, aiming to ensure a stable supply of batteries from the Chinese firm as it ramps up electric vehicle production. The two firms signed a deal last year for Farasis to supply Daimler with lithium-ion battery cells and Farasis is building a factory in Germany.

Automakers are keen to build deeper relationships with battery makers to manage supply, either by investing in the companies or signing long-term contracts

Strategic Partnership & Market Developments

April 2020

Vattenfall, has partnered with **Hyundai**, in the Dutch market to jointly offer home/work charging and public charging solution for Hyundai's customers.

Soon, Hyundai dealers will be offering purchase of a 22 kW (3-phase) charging point and access card to the public charging network from Vattenfall

June 2020

Polestar has announced a partnership with **Plugsurfing** to provide convenient access to various public charging networks in Europe using a single account and payment. With over 195,000 compatible EV charging points in the region, Plugsurfing provides a convenient solution to accessing and paying for electricity from a variety of public charging service providers

June 2020

MG Motor India has joined hands with **Tata Power** to set up superfast chargers for electric vehicles (EV) at select MG dealerships and offer end-to-end charging solutions to its dealers across India. Tata Power will deploy 50KW DC superfast chargers at select MG dealerships besides offering end-to-end electric vehicle charging solutions

April 2020

BYD and **Hino Motors** have announced a new strategic business alliance agreement with a focus on collaborating in commercial battery EVs development. The cooperation between the Chinese and Japanese companies will benefit the development of commercial vehicle electrification by introducing leading technology and rich experience

June 2020

The UK electric vehicle charging network, **InstaVolt**, is partnering with **McDonald's** to roll-out electric vehicle (EV) rapid charging points across its "Drive Thru" restaurants in the UK. It will increase accessibility of rapid charging by providing a network of convenient and recognizable locations beyond service stations, residential streets and workplaces

May 2020

The UK-based **Liberty Global Ventures** and **Zouk Capital** have announced a joint venture partnership named Liberty Charge. The partnership will roll out on-street charging points for electric vehicles in residential areas across the UK. Access to public electric vehicle charging is a key initiative within the UK government's drive to reduce net carbon emissions to zero by 2050

Inorganic Growth Strategy: Investment & Funding

The investments from the strategic investors will help Nio to support its business development, to enhance its leadership in the products and technologies of smart electric vehicles and to offer services exceeding users' expectation

The injection of capital comes from several investors, including Hefei City Construction and Investment Holding Group, CMG-SDIC Capital and Anhui Provincial Emerging Industry Investment Co.

NIO

April 2020

Nio has secured a **$1 Billion** investment from several state-owned companies in Hefei in return for agreeing to establish headquarters in the city's economic development hotspot and giving up a stake in one of its business units

April 2020

AMPLY Power has secured **$13.2 Million in Series A** funding from investors, including Soros Fund Management and Siemens Financial Services and existing seed-round investors such as Congruent Ventures, PeopleFund, and Obvious Ventures

AMPLY

TRITIUM

June 2020

Australian electric vehicle charging infrastructure company Tritium has secured a **$45 million** investment from US healthcare giant Cigna Corporation, that will accelerate the company's expansion into the United States

April 2020

FreeWire Technologies has raised **$25 Million** funding to accelerate development and rollout of its "infrastructure-light" EV charging technology. This Series B funding is backed by BP Ventures, ABB Technology Ventures, Energy Innovation Capital, and other financial & strategic investors, including Silicon Valley Bank

DEVELOPMENTS Emerging Trends

The quarter has witnessed multiple investments and strategic partnership of EV charging companies with service providers for product and market expansion, technology up-gradation and innovative business solution.

European countries, UK in particular is witnessing increased activities in EV Charging infrastructure development

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Companies are investing with more ambitious focus on rapid charging

HUBER+SUHNER has designed a system for charging stations with an output of 150kW up to 500kW. Alongside the cooled cable system, Company has also developed a new 24 V cooling unit to increase cooling capacity and reduce operational temperatures of the power lines

The charger is available with Combined Charging System (CCS) type-1 (USA, Canada) and type-2 connectors (Europe), as well as with individual customer design and labeling

Ultra-Fast Charging Technology to Improve EV Charging Experience

CHAdeMO

The CHAdeMO Association and China Electricity Council (CEC) has jointly developed a new EV charger with the working name "**ChaoJi**" that enables **ultra-high-power charging**

According to the organization, the charging standard will enable DC charging with a capacity of "over 500kW"

HUBER+SUHNER

HUBER+SUHNER, one of the top suppliers of **liquid-cooled charging cable systems** for EV fast chargers, announced the introduction of a new model, **the RADOX HPC500**, which is the world's first capable of withstanding continuous charging at 500A even in high-temperature environments (up to 50°C)

DEVELOPMENTS Emerging Trends

In tune with last quarter, where Automotive OEMs including Iberdrola, ABB, EVBox, Volkswagen, Porsche etc. investing heavily on ultra-fast charging station similarly this quarter has also witnessed many leading players focusing on ultra-fast charging solution to improve the customer experience

Ultra-fast charging Technology, Mobile charging Technology, and Wireless charging technology was in trend following the last quarter

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Electrify Canada's new locations will create a network for EV owners to access a number of the province's most popular tourist attractions, including the Nicola Valley, Banff National Park, Discovery Trail and Riverside Park Beach

By the end of the year, electric vehicle drivers in British Columbia will be able to charge up at nine new stations along the Trans-Canada Highway and Highways 97 and 99

Ultra-Fast Charging Technology to Improve EV Charging Experience

With the opening of its first British Columbia station in Merritt, B.C, Electrify Canada today announces its official expansion into Western Canada. Electrify Canada expands network of **High-Speed EV Chargers to British Columbia**

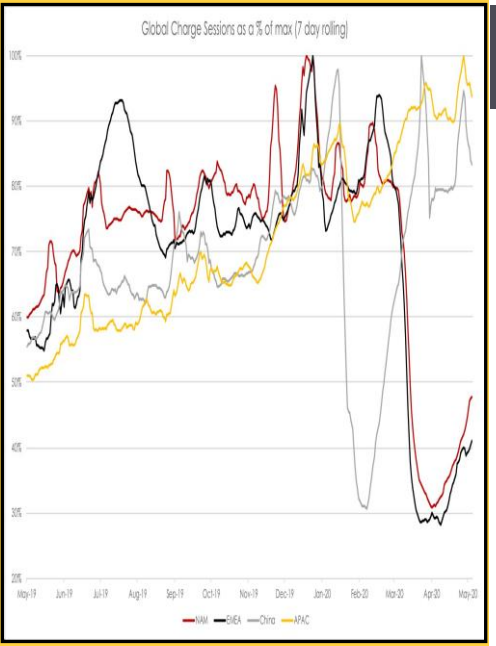
Electrify Canada already has four charging station sites open in Ontario, with fifteen more in the planning stage in Ontario and Quebec

The Volvo LIGHTS project is a partnership among the **Volvo Group, Volvo Trucks, and Greenlots** along with several more industry leaders and stakeholders in transportation & electrical charging infrastructure

The cost of total project is ~$90 million, with a funding award of $44.8 million with the investors. Company will be supplying chargers capable of charging batteries at up to 920 VDC for Volvo's Low Impact Green Heavy Transport Solutions (LIGHTS) project

Porsche has "Taycan" EV unique - whereas most EVs have a 400V electric system, the Taycan runs on 800V. The 400V EVs can be charged at around 150 kW, but there are already even **faster 800V chargers** out there that can pump juice back into a battery pack at a rate of 350 kW. General Motors is also going to deploy 800V vehicles in the near future

Impact of Covid-19 on EV Charging Infrastructure



Tesla CEO and co-founder Elon Musk has shared an interesting chart that reflects how the various stay-at-home measures to contain Covid-19 across different global regions has reduced use of Tesla DC Superchargers

Tesla shows how COVID-19 affected supercharging usage

- The coronavirus outbreak and lockdown significantly affected the automotive market and traveling in general, as well as refueling/charging businesses
- The usage of Superchargers hit rock bottom during the early stage of the coronavirus outbreak in China, Europe and North America
- Fortunately, things improved really fast in China, and usage not only quickly returned to high levels but even reached a new record in April
- In both Europe and North America, the bottom period was noticeably longer than in China, but it seems that it is finally growing
- The dip in China, North America and Europe is significant and sales dropped by ~70% from before governments responded to the Covid-19 pandemic

Tucson Electric rolls out business rebates for electric-car chargers

- The electric utility company Tucson is providing an incentives of up to 85% of the cost of installing electric vehicle charging stations, under a new Tucson Electric Power Co. program due to lowering in the demand caused by Covid-19 pandemic
- The TEP Smart EV Charging program offers rebates of $4,500 per charger plug-in, or port, for so-called Level 2 chargers installed at workplaces, including retail shops, restaurants and other businesses
- Similarly the program offers incentives of $6,000 per port for Level 2 chargers installed by apartment and condominium complexes or by nonprofit organizations
- Businesses that install rapid “DC fast-charger” systems are eligible for rebates of up to $24,000 per charging port, up to 75% of the project cost.

FutureBridge Insight on EV charging infrastructure

- Wireless , Mobile Charging and Ultra-fast charging technologies are emerging to enhance the EV charging experience
- This Quarter has seen multiple launched of app based payment solution as EV service providers gears-up for quick payment
- In tune with last quarter, this quarter also witnessed substantial investment on ultra-fast charging station by leading players on ultra-fast charging solution to improve the customer experience

What should you investigate ?

How Automotive companies are investing across EV charging start-ups to align them for future?

What are the new EV charging technologies that are set to capture market?

Covid Impact: Ford cancels plan to make Lincoln Electric Vehicle with Rivian

- Ford's plan to make an electric vehicle in cooperation with Rivian, a Michigan-based electric vehicle company, under its luxury Lincoln brand have been called off. Ford's announcement implied that the coronavirus pandemic was to blame for the decision to drop that plan
- The new vehicle was to be built using Rivian's so-called "skateboard platform," a basic electric vehicle structure that will also underlie Rivian's own R1S SUV and R1T pickup truck
- Given the current environment, Lincoln and Rivian have decided not to pursue the development of a fully electric vehicle based on Rivian's skateboard platform

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