Q&A: MICHAEL D. FARKAS, CEO AND CO-FOUNDER, CAR CHARGING GROUP

‘We need to simplify the charging process’

Car Charging Group (“CarCharging”) spoke with IHS Hybrid-EV about the acquisition of Blink related assets from ECOtality & benefits of bringing several charging systems under one framework

> **With the acquisition** of the Blink EV charging stations and the Blink Network, CarCharging has effectively consolidated a part of the car charging equipment sector that could bring about a systemic change in efficiency and effectiveness. Having different charging systems on one network and providing interoperability between various charging networks brings the charging station conundrum closer to being resolved. Florida based CarCharging acquired four of its competitors - Blink, 350Green, EVPass, and Beam Charging as part of a huge growth effort in the last 12 months. “We are now largest owner/operator of charging infrastructure in the US,” said Michael D. Farkas, CEO and Co-Founder, CarCharging.

The company, which owns and operates electric vehicle (EV) charging stations in the US, works with a revenue-tagged business model that appears to hold promise. The model eliminates capital costs for property owners while simultaneously offering an additional revenue stream since CarCharging shares a part of the EV charging revenue with property owners. Going ahead, the company is planning to expand its market and enter Europe in the near term.

CarCharging has consolidated a part of the car charging equipment sector with several acquisitions. Source: Car Charging Group

Excerpts:

What kind of capital expenditure is involved in setting up charging stations in public places?

It’s a costly venture. On an average, Level 2 installation costs USD8,000-10,000 depending on location and type of hardware. DC fast charger installation, including hardware, will cost about USD30,000-40,000. It’s an expensive venture. But, alternately, it is not a cheap to set up a gas station. You need to put modern infrastructure in order to fuel cars.

Do you target residential properties?

Almost 89-90% of all charging is done at home. It impacts our business tremendously. A lot of people in the US live in multi-family residential facilities but don’t have dedicated parking spaces. These are our customers. In this respect, we have joined hands with owners and operators of apartments, such as Equity Residential,. Our focus is to support the multifamily market, people living in condos and apartment buildings, to allow them to have the ability to charge. In addition, we have a residential charging product -- Blink HQ -- that supports single-family homes and others with dedicated parking spaces.

You have introduced kWh pricing. Why?

Each car charges at different rates. A LEAF draws electricity at a different rate than the Chevrolet Volt. A Volt is different from Tesla. If you go by a time-based pricing model, then a Nissan LEAF pays half the price for electricity than the Chevrolet Volt because the LEAF battery gets charged at twice the rate. The only fair methodology is kWh, just like in gasoline cars we use litres/gallons. The measurement for electricity is kW and that’s what we should be using. In many electric cars, as in all cars, you can get half the mileage. Why? Because of driving patterns - the AC is on, the radio, driving fast, etc. If you are paying by the hour, you are not getting any benefit. It’s all about driving patterns and the only fair methodology to pay for electricity is kWh.

What factors impact profitability of charging stations?

First is the amount of different EVs in the market. Today, not many electric cars are available on their (automakers’) offered product lineup. And most of the cars that are offered are considered compliance cars to cater to certain markets, such as California, but they are not available in other states in the US. For example, not every Ford dealership offers electric vehicles. You have Tesla, but they are very

limited. Even if you want a Volt, there are not so many of them in the lot. I think the Volt is the top selling EREV in the US and I think they would have a lot more sales if it was available as a five-seater, which is the classic American mid-sized car. As a four-seater, the Volt actually eliminates a lot of people from buying the car. Besides, there are not many choices on the lot available in colors and options in electric cars like you do have with other (gasoline-powered) cars. As we start witnessing more products, expanded availability and options as is common in the automotive industry today, I believe there will be an increased adoption rate , which will have major impact on our business.

Have you reached a stage when you can recover costs?

At this stage, no. We do have units that are generating a decent amount of revenue and we do expect a return on our investment. We look at this as long term; it's not a short-term business for us. We do realize that it will take some time. There will be a time when there will be enough cars to support the infrastructure that will make this a viable business for us. We believe that in conjunction with the revenue from the charging stations, with the EV charging equipment that we have for sale, we should be able to see profitability in 2015. On an operating basis, we may make money in 2015, but on a global basis, we may be spending money to increase our market share and install new hardware.

What factors do you think are limiting EV sales?

I think what is really stopping the market is the misconception of the amount of miles that people drive.

When the average consumer understands that they don't drive more than 40 miles a day; when the average consumer understands that the car which has a range of 150-200 miles is more than enough to satisfy 95% of their needs. When we start having cars with the ability to go 300 miles per charge, not with USD100,000 Tesla cars, but with an average price of USD30,000-40,000 – these are the factors, which will commercialize the product.

CarCharging acquired ECOtality's Blink network of charging stations for USD3.4m in 2013. Source: Car Charging Group

Is CarCharging dependent on private investors or government for raising capital?

CarCharging receives most of its funding from private investors, mostly hedge fund investors, and institutional investors. We do receive government grants and subsidies but it is not the focal point of how we grow our business. We are not like ECOtality where our business model is completely dependent on government finance. It's actually the exact opposite.

How much have you raised so far?

We have raised approximately USD27m, and, of the total, we raised USD15m in the last two months. We raised USD5m before we purchased the Blink related assets and USD10m a couple of weeks ago. We have always managed to balance installations versus car sales. We try not to focus on infrastructure when there are not many EVs in a particular area. We place charging stations in an area based on demand. We believe in maintaining a balance between spending and market demand.

Wasn't Blink a risky acquisition considering the negative customer feedback the Blink chargers received in the past?

There are problematic issues in all companies and especially acquisitions. We knew what we were buying. We were aware of the technological issues, the network issues. We literally acquired approximately 12,500 charging stations which had issues. Since the acquisition, we have worked on repairing all of the charging stations in the public domain. It takes time and it will not happen overnight. We are focusing on the most widely used areas and the most utilized charging stations in those areas. We have cleaned up hundreds and hundreds of charging stations to bring them back to working order.

We continue to do so. We are enhancing the hardware and making it better. We are completing upgrades. We are aiming for enhanced functionality in Blink network. The bottom line is that we acquired assets that originally cost approximately USD230m for only USD3.335m. On a financial basis, it is an amazing transaction for us. The hardware that we gained is even better. We have thousands of charging stations in inventory that we can now launch. But, we are going to have to improve the hardware before we put it on the ground.

How did you tackle overheating issues with Blink chargers?

There was an issue with the cord set from REMA, which caused the overheating of the Blink chargers. We have been working with REMA on a correction and we plan to swap the cord sets that had overheating issues. The overheating issue has been very limited in scope.

Do you plan to change the Blink revenue model?

There are a lot of Blink charging stations that we believe are incorrectly priced. There are a lot of units that were giving away charging for free, which isn't sustainable. We had a similar situation when we acquired 350Green. We moved 350Green units from their model to our model. Usage did go down slightly but revenues increased. Ultimately, usage picked back up and revenues continued to increase. We are going to be shifting Blink's payment model to our model, which is on a per kWh charging basis. That should be implemented over the next couple of months.

Will Car Charging continue to work with ECOtality's vendors?

We may. We are exploring options on the hardware side. We are truly agnostic regarding the hardware.

We like working with manufacturers such as ABB and Nissan on the DC fast charger. We have a lot of inventory that we need to work through before we start placing orders for our public level 2 charging stations.

How do you integrate different charging systems into your network?

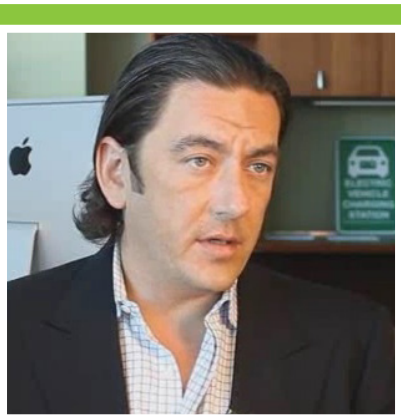
We are using Blink network to be that central system, and are enhancing the functionality of the Blink network in order to communicate and serve as the backbone to multiple hardware operators. We are looking to integrate all of our different equipment on the Blink network. Apart from what we have, CarCharging or as a result of acquisitions in the past, we endeavor to offer a network on which other vendors can connect with reasonable fees, therefore, offering a broad based network.

We are trying to be hardware agnostic and to offer a fully interoperable Blink network. That's our plan.

Do you think open payment charging system has the potential to eliminate the business model of membership schemes?

Yes. I believe there should be an open payment system enabling people to charge EVs at any charging station and pay with a credit card or other method. You shouldn't be required to have a membership. You shouldn't have to carry an RFID card. I am a strong proponent of that. Although from a security and cost perspective, it isn't best to have a credit card reader on a unit itself. But there are smart card readers where you have a smart credit card and you are able to read it from the unit. In addition, mobile applications will be able to allow you to use your credit card so you don't need a physical card at all.

However, memberships ultimately do offer a less expensive charging fee because of high-end discounts. For instance, if a customer wants to charge their car on a routine basis, we can provide it as part of a monthly cost of USD99. If they prefer to pay per kWh, it would cost them a bit more. There are benefits of having memberships and within those memberships, you need to have interoperability between charging networks. We would like to be able to sell a membership, which will provide access to a Blink charging station and NRG's charging station, eVgo. Then eVgo and the Blink network should be able to reconcile. This way, the EV owners have the ability to charge at any charging station. That's where the market needs to go.



"Many Blink units, we believe, are incorrectly priced. Lot of units were giving away charging for free. We are going to be shifting Blink's payment model to our model — on a per kWh charging basis. "

Michael D. Farkas, CEO and Co-Founder, CarCharging

Basically, we need to simplify the charging process. There should be a clear and concise way where you can use a station from any network like ChargePoint, GE, and Blink. These networks will then need to communicate amongst themselves.

However, that may not be in the best interest of businesses because a manufacturer may say we will lose control and not have the same dominating effect on the industry. The process will really push the control to the hands of owners and operators of hardware, where we believe that it should be. If they are pay for the station, it shouldn't be the manufacturers of hardware in control, but the one who owns and operates it.

Once a global interoperable standard for electric car charging is in place, what will happen to the different chargers – Level 2 and DC - on which so much has already been invested?

In the US, the Level 2 stations have been consistent with different communication protocols and different networks. Tesla is the only station with its own charging mechanism. I actually support the adoption of the Tesla standard, as it is by far the best. It has one plug; a very streamlined plug. It works for both slow charging and supercharging, and provides from 10kW to 125kW. That charging mechanism is the best by far. But I doubt that other manufacturers will adopt Tesla's charging system.

The reality is that Level II chargers will remain where they are. I do think that we will see 80AMP Level II charging stations with the same male-female connectors, so that will not change.

In regard to the DC fast chargers, Nissan made a serious effort to introduce CHAdeMO compatible chargers to the market and CarCharging is also working with them to install these units as we

believe that this definitely is a viable business. And, it is not a bad standard. But, we also know that GM, BMW, Volkswagen and others are working on a combo unit. Ultimately, we are discovering that charging stations now have both the cords – CHAdeMO and SAE combo. Although I'm supporting CHAdeMO, there is Volkswagen, BMW and GM on one side supporting the combo version, and Nissan on the other. It will be very difficult for the CHAdeMO to succeed. I think the combo will ultimately be the victor. It is not necessary the better product, but has more support. ■

Q&A: ANTHONY THOMSON, VICE-PRESIDENT, BUSINESS DEVELOPMENT & MARKETING, QUALCOMM

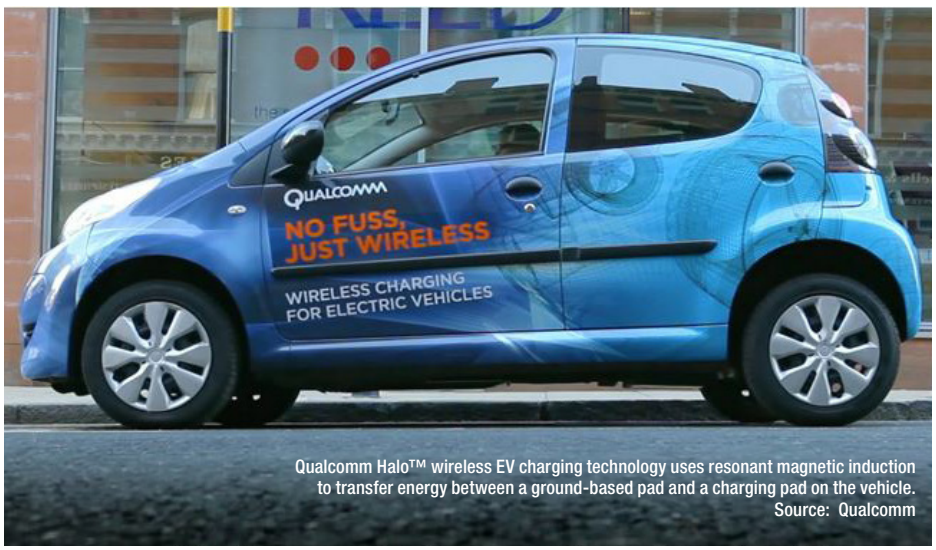
Endeavour to 'unplug' electric cars

While Qualcomm should be lauded for developing automotive inductive charging, it will still be many years before wireless charging is anything more than a niche solution for automotive

> **In a bid** to strengthen its presence on the global stage, the Chinese government aims to develop the country as a major base for the production and deployment of new energy vehicles (NEVs).

The government has announced ambitious aims to introduce at least half a million NEVs by end 2015 and over a million by 2020. The new global Formula E Championships will debut in Beijing in September 2014, where automakers will showcase their fastest electric vehicles (EVs), while technology companies such as Qualcomm will showcase their EV related technology.

IHS Automotive caught up with Qualcomm's Anthony Thomson to understand the Qualcomm wireless EV charging (WEVC) system and how it may help solve the EV charging shortfall in China.



Qualcomm Halo™ wireless EV charging technology uses resonant magnetic induction to transfer energy between a ground-based pad and a charging pad on the vehicle. Source: Qualcomm

How does Qualcomm's wireless EV charging system work?

Qualcomm Halo™ WEVC technology uses resonant magnetic induction to transfer energy between a ground-based pad and a charging pad on the electric vehicle (EV) which then charges the EV battery. The base technology has been around for over 100 years and is similar to how your electric toothbrush is recharged – but on a larger and more complex scale.

Does it matter where a car is parked or how it is parked for the wireless charging system to work?

The Qualcomm Halo WEVC system is highly tolerant to misalignment (in both X-longitudinal and Y-latitudinal directions) and allows highly efficient power transfer at pragmatic levels of parking misalignment. It is also tolerant in the Z (vertical) direction and can compensate for the different road heights of vehicles. Basically if you park between the white lines of the charging bay it will charge.

What exactly is the "halo" effect of the WEVC system and how will this be used on the safety cars at the electric formula car racing events to begin next year, with Beijing as the first city?

As I've shared the Qualcomm Halo technology is based on resonant magnetic induction using a patented Double "D" Quadrature magnetic design that supports high energy transfer power and high efficiency of >90%.

Qualcomm is a founding technology partner of the Formula E championship. Qualcomm Halo WEVC technology will be installed into FIA Formula E Championship safety cars so they can be wirelessly recharged and always ready during each race. Qualcomm will also evaluate the connectivity and mobile technology of the ten venue cities around the world, providing solutions to help enhance the spectator experience.

Qualcomm is also the official Drayson Racing Formula E Team launch partner and Drayson were the first team to announce they would be entering the FIA Formula E championship. We are also partnering with Drayson to bring WEVC to the Formula E race cars.

Why is the Qualcomm wireless EV charging system not an "off the shelf" product? What does it cost?

Wireless charging is not like buying a roof rack or new headlights for your vehicle. It needs to be integrated into the vehicle