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Qualcomm calls it a 'breakthrough.'

If there's one technology that would instantly remove the phrase "range anxiety" from our vocabulary, it's dynamic charging. That's the fancy way to say an electric car that is able to charge its battery while moving. Lots of test projects have been instituted around the world, and today Renault and Qualcomm announced an update to Qualcomm's previously stationary-only Halo wireless charging technologies that can charge an EV on the road vehicle charging (DEVC) tech can send 20 kilowatts into a



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Qualcomm installed the receivers into two Renault Kangoo electric vehicles. The 100-meter FABRIC test track was built by Vedecom at Satory, Versailles, near Paris, France as part of a nine-million euro project partly funded by the European Commission. Qualcomm says that these are the components used in the FABRIC DEVC system:

“ The 100-meter track, comprised of 4 x 25 meter stubs, each running from its own power supply. Each stub powers 14 Base Array Network (BAN) blocks coupled magnetically into the backbone cable. The power is transmitted across the air gap to two 10 kW vehicle pads (VPs) located under the EV. The vehicle system converts the 85-kHz AC and delivers DC power as requested to the EV's battery management system. ”

Qualcomm Halo, the non-moving kind, has been tested for three years at the FIA Formula E race series. Halo has also been available as aftermarket upgrades to some plug-in vehicles, but it's only part of the puzzle. Qualcomm says that wireless – and especially dynamic wireless – charging is important for self-driving vehicles. After all, the company says, “you cannot call a car ‘autonomous’ if it cannot fuel/recharge itself.”

Press Release:

Qualcomm Demonstrates Dynamic Electric Vehicle Charging

SAN DIEGO —May 18, 2017 — Qualcomm Technologies, Inc., a subsidiary of Qualcomm Incorporated (NASDAQ: QCOM), today demonstrated dynamic electric vehicle charging (DEVC), which allows vehicles to charge while driving. Based on the Qualcomm Halo™ wireless electric vehicle charging technology (WEVC), Qualcomm Technologies designed and built a wireless DEVC system capable of charging an electric vehicle (EV) dynamically at up to 20 kilowatts at highway speeds. Qualcomm Technologies also demonstrated simultaneous charging, in which two vehicles on the same track can charge dynamically at the same time. The vehicles can pick up charge in both directions along the track, and in reverse, further showcasing how the Qualcomm Halo DEVC system has been designed to support real-world implementation of dynamic charging.

The dynamic charging demonstrations took place at the 100-meter FABRIC* test track, which has been built by VEDECOM at Satory Versailles. Qualcomm Technologies and VEDECOM integrated the source part of the Qualcomm Halo DEVC system in the test track, while VEDECOM and Renault integrated the receiving part onto two Renault Kangoo vehicles. Following today's demonstration, the Qualcomm Halo DEVC system will be handed over to VEDECOM to perform tests for FABRIC. These tests will evaluate the operation, safety and efficiency of energy transfer to the vehicles for a wide range of practical scenarios including vehicle identification and authorization on entering track, power level agreement between track and vehicle, speed and alignment of vehicle along track.

FABRIC is a €9 million project, mostly funded by the European Commission, addressing the technological feasibility, economic viability, and socio-environmental sustainability of wireless DEVC. The project began in January 2014 and will continue through December 2017, and is being undertaken by a consortium of 25 organizations from nine European countries, including automotive manufacturers, suppliers, service providers and research organizations from automotive, road and energy infrastructure domains. VEDECOM is one of the FABRIC collaborators and responsible for providing the demonstration of the charging solution at Satory using the Qualcomm Halo DEVC system. FABRIC's main goal is to conduct feasibility analysis of wireless DEVC as a means of EV range extension.

“Our engineers and management have fully supported this project since the very beginning as it aligns perfectly with our focus on EVs, charging systems and mobility services,” says Luc Marbach, CEO, VEDECOM. “We are a public-private partnership focused on pre-competitive research. The installation of one of the world's first DEVC test platforms has provided us with a unique test facility

"Being part of this exciting project has enabled us to test and further research dynamic charging on our Kangoo Z.E. vehicles," said Eric Feunteun, Electric Vehicle Program Director, Groupe Renault. "Our engineers have worked very closely with the Qualcomm Technologies and VEDECOM teams to complete the DEVC system integration demonstration as part of FABRIC. We see dynamic charging as a great vision to further enhance the ease of use of EVs, thus the accessibility of EVs for all."

"We are inventors. We are WEVC. This dynamic charging demonstration is the embodiment of this," said Steve Pazol, vice president and general manager, Wireless Charging, Qualcomm Incorporated. "I am immensely proud of what we have achieved. The combination of a global team of expert engineers and Qualcomm Halo technology, which covers all aspects of WEVC systems, irrespective of the magnetics used, has enabled us to really push the boundaries of the possible and outline our vision for future urban mobility."

About Qualcomm

Qualcomm's technologies powered the smartphone revolution and connected billions of people. We pioneered 3G and 4G – and now we are leading the way to 5G and a new era of intelligent, connected devices. Our products are revolutionizing industries, including automotive, computing, IoT, healthcare and data center, and are allowing millions of devices to connect with each other in ways never before imagined. Qualcomm Incorporated includes our licensing business, QTL, and the vast majority of our patent portfolio. Qualcomm Technologies, Inc., a subsidiary of Qualcomm Incorporated, operates, along with its subsidiaries, all of our engineering, research and development functions, and all of our products and services businesses, including, our QCT semiconductor business. For more information, visit Qualcomm's website, OnQ blog, Twitter and Facebook pages.

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* FABRIC stands for FeAsiBility analysis and development of on-Road charging solutions for future electriC vehicles.

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Scott Franco



So a short section of track is going to deliver 20kW for like less than a minute? Or is an entire long highway going to get that?

Sounds like a very expensive way to charge electric cars.

👍 0 | 0 👎 Reply

🕒 11 months ago ⬆



NeilBlanchard



It only needs to deliver ~0.3kW charging to each car. It only has to replace the energy used to move the car, on average.

👍 0 | 0 👎 Reply

🕒 11 months ago ⬆



Bul_gar



With what speed it needs 300W?

👍 0 | 0 👎 Reply

🕒 11 months ago ⬆



**Cavaron**

You should be able to get one mile on 300 watt-hours at 60 mph.



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[Reply](#)

🕒 11 months ago

**Brian**

Yes, but at 300 watts, it would take an hour to get 300watt-hours. At 60MPH, it would take only 1 minute to drive 1 mile.

According to Tony Williams' famous Leaf chart:

Speed (MPH) Power (kW)

35 5.56

45 8.65

55 12.79

65 18.06

75 25.00

20kW should sustain a Leaf at about 67-68MPH. Seems reasonable to me.



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**SJC**

You have to have 20 kWh for the hour journey at 60 mph for each and every car. That is providing ALL the cars with charging along the 60 miles. One heck of a lot of energy at more than \$1 million per lane mile.



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[Reply](#)

🕒 11 months ago

**Bul_gar**

Some Israel company have research on that but 10 million \$ for 20kw on 60 mile is too much, that's more than 20 Tesla superchargers.



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🕒 11 months ago

**SJC**

If you start with 10 miles both directions with 200 cars on the lanes at all times it is 5 megawatts to charge all cars or more than 100 megawatt hours per day.



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F150 Brian



That would

make a huge difference and solve the problem of over-crowded highway charging stations.

Getting to a practical installation will be an interesting journey. If it is applied to the surface, then it could be installed quickly but it would be exposed to the elements (including salt, snow plows, friction due to hard braking, sharp metal from an accidented car gouging it, etc).

If embedded in the road, then it would be more protected but would require resurfacing alot of road, which happens regularly but will take along time to complete. Also need to factor in expansion which cracks the road.

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11 months ago



Someone out there



That's very nice but I wonder how charging (paying) for the electricity will work.

0 | 0 [Reply](#)

11 months ago



Brian



I bet this will show up first in Formula. It would be cool to move away from swapping vehicles mid-race to simply charging during a particular stretch of each lap. And then having competitors trying to keep each other off the charge pad would add a whole new dimension to racing!

0 | 0 [Reply](#)

11 months ago



Homer Simpson



The Formula-racing with these sounds interesting... but if then there's no battery they will be VERY lightweight. The only problem is if power gets cut the whole race is dead (think bumper-cars at a carnival)

0 | 0 [Reply](#)

11 months ago



Brian



I was thinking the combination of a small battery and a small re-charge strip rather than batteryless and a full-course charging strip. Either way, you'd need far more than 20kW to be useful to Formula E, so maybe it won't happen. It was a nice thought anyway.

0 | 0 [Reply](#)

11 months ago





SJC



Instead of 60-100 kWh battery packs we can use 15-20% that much and make 5 to 10 times the EVs with the same number of cells.



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Reply

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NeilBlanchard



Interesting stuff, and certainly would be great IF it can be implemented, for a reasonable cost.

Once / If the charging issues are solved, it still has to work in real world conditions. Issues like traction and safety, and like snow plowing, etc. will all be additional challenges.

I wonder if it wouldn't be easier to go to an overhead power system, that could also work for long haul trucks?



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Reply

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Doggydogworld



Dynamic charging is awesome and should be the US's #1 infrastructure project. Wireless is by far the "coolest" method, but:

1. It's expensive – digging into highways is a show stopper.
2. 20 kW doesn't cut it. Barely enough for a SUV, and that assumes you cover every mile of highway. Forget semis.
3. It'd take 25 years to deploy (10 just to nail down a standard as the technology is still evolving).

Honda's system, which puts wires in standard guardrails, is 20x the power, a fraction of the cost, doesn't require ripping up highways, only needs to cover one mile out of 25 and could be fully deployed in a few years.



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Reply

🕒 11 months ago



Driverguy01



Just like Fuelcells, it wont happen. Too expensive to implement and batterie technology progression will make this obsolete in a few years....



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Reply

🕒 11 months ago




WARREN



What is the air gap needed? And if so, how will it be affected by rocks and other road



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MTN Ranger



Most wireless charging systems use a 3-4" gap.

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🕒 11 months ago



Mark C



For light BEV's, range issues are being solved and have started coming to market, thanks in part to a heavy push from Tesla. This "imbed it into the road surface" concept won't work for many reasons already mentioned

If we put long haul freight on rails and have rail distribution centers so that on highway freight would only be hauled relatively short distances, you could do that with BEV trucks. Where the distance and/or topography won't allow BEV trucks (think crossing mountains), then trucks driving dedicated lanes with catenary wires overhead for the longer highway stretches and battery power for the final few miles.

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🕒 11 months ago



evz3



Id guess this works best in congested cities & at traffic lights. It can recharge plugin hybrids and bill/fine the owners for doing a lousy job not arriving with sufficient charge in the city! Not recharging probably means London like fines for motor vehicles entering the city.

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🕒 11 months ago



DJ



I already have to put up with idiots who literally stop on the road and reverse so that they can turn right. Hello, just go up and make a U-Turn!

If they put something like this in you're gonna end up with people stopped on the highway because they need a little more juice to make it home.

Also, I thought part of wireless charging was that it would sense if you were in the car and not charge if you were?

Well at least it's part of the patent

<http://insideevs.com/hyundai-wireless-charging-patent/>

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SJC

I can think of
commuter

lanes that could use this, but it would have to take ALL cars to be used effectively.

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guyinacar



This isn't for real roads, IMHO. It's for areas that happen to be paved, sure, but where vehicles inch along slowly and where both catenaries and a series of plugs are impractical. It's for the areas where humans meet "their" vehicles. So taxi ranks, golf cart rentals, etc. It's for the sharing economy, and it's a winner. But it also opens some intriguing possibilities for where non-humans meet "vehicles" for all manner of horizontal travel. Maybe warehousing, autonomous and containerized freight sorting (stevedores), materials handling, farming, mining, etc.

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SJC



It is for roads, they would not say 60 mph if it were not. I can see electric trucks using this to help pay for the road cost with less battery weight and more range.

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Davek



Meh, nothing all that new. Bombardier had this kind of thing ages ago with their Primove system for streetcars, and the German Aerospace Center has a design for a system for a high speed train that would deliver 18 MW at 400 km/h!

http://www.dlr.de/dlr/Portaldata/1/Resources/documents/2014/23679_Handout_Nr_11_2_Zugkonzept_NGT_HGV_RZ.pdf

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🕒 11 months ago



MM



From hypermiling our Leaf I can see where this would be great on long grades, or the first 200 ft of acceleration from a stoplight. I wouldn't need a "re-charge" if I encountered fewer range-sucking situations. Add solar along the road and maybe overall costs could be lower.

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