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NC city charged up for electric car development

GASTONIA, N.C. Forty miles ... 100 miles ... 200 miles ...

A new generation of fully electric vehicles claims the ability to cover that much ground on a single charge, which would easily get most Americans to work and back without having to plug in.

But so far, the batteries powering EVs haven't gone the distance at a cost that most U.S. drivers can handle. That's why research taking place at FMC Lithium's Center for Lithium Energy and Advanced Research (CLEAR) has put Bessemer City on the road map to EV development.

Manufacturers of rechargeable lithium ion batteries from all over the world have visited the CLEAR facility. And growth in the market for lithium ion batteries will soon be driven by demand for large-format batteries that are safe, compact, light-weight, long-lasting and priced reasonably enough to attract car buyers, FMC officials say.

"It's exciting when you have people coming from all over the world to Bessemer City to visit this facility," said Brian Fitch, a Cherryville native and Appalachian State-trained chemist working in the CLEAR facility. FMC Lithium opened that facility in September 2008.

FMC Lithium 's Bessemer City plant on N.C. 161 employs about 240 people making lithium products with numerous applications, including grease and lubricants, polymers and pharmaceuticals. Kings Mountain has large deposits of lithium, but FMC hasn't mined in this area since the 1990s. Today, the lithium is found in dry lake beds in the northern Andes Mountains in Argentina.

A quarter of sales at FMC Lithium end up in rechargeable lithium ion batteries. But nearly all of those batteries power portable consumer electronics. Less than one percent of sales at FMC Lithium are bound for EV prototypes, said Eric Norris, FMC's Global Commercial Director.

However, in another 10 years, lithium ion batteries could account for more than half of sales with much of that growth generated by consumer demand for electric cars, Norris said.

"That market hasn't developed yet," Norris said, "but the consumer interest is there."

The near collapse of domestic automakers last year along with a renewed focus on curbing climate-changing greenhouse gases has fueled a growing interest in electric vehicles stateside. The federal government is offering tax breaks to consumers that buy alternative fuel vehicles and pouring billions of dollars into research to develop new energy platforms.

This November, Chevrolet is planning to launch the Volt, which drives up to 40 miles on an electric battery before a back-up combustion engine takes over. And Nissan is touring the U.S. with prototypes of the Leaf, an EV advertising 100 miles on a single charge. Both of those vehicles run on lithium ion batteries, but neither manufacturer has suggested a price.

Right now, the only vehicle utilizing lithium ion batteries is the Tesla Roadster, which travels more than

200 miles on one charge, but starts at \$101,500. The popular hybrid electric Toyota Prius has a nickel-metal hydride battery pack, but that technology isn't practical for a fully electric vehicle. Lithium, which is the lightest metal on the planet, has a higher energy density, making it ideal for compact batteries in handheld electronics, Norris said.

But lithium is also potentially dangerous and some batteries have caught fire in older model cell phones and laptops. While the technology in today's consumer electronics has proven to be safe, similar safeguards must be engineered into the larger format batteries as well. Finding the right balance of power and safety in the larger automotive batteries is the key to future innovation.

"You can make a battery with more power, but it must have the right balance of safety and cost to appeal to consumers," Norris said.

In the U.S., a country that first made automobiles for the masses and designed its communities around vehicle traffic, cheap gasoline is still the standard. But the U.S. isn't the largest car market anymore - that's China. And EV technology isn't waiting for American consumers to embrace it first, Norris said.

Today 80 percent of all lithium ion batteries are made in Asia - Japan, China and Korea, Norris said. Like the U.S., China generates a lot of its electricity from coal, which diminishes some of the environmental benefits of electric cars. But China is an emerging automotive market, where drivers are more likely to bypass gasoline-powered vehicles and develop infrastructure based on the latest technology, he said.

And in Europe, where higher fuel taxes provide an incentive to EV drivers, the electric cars are also catching on faster than they have in the U.S., Norris said. And while the U.S. market may not move as fast, there is a growing interest here, he said.

"It's a very global business for us," Norris said.

The lithium industry was hit hard last year with earnings down in some cases 25 to 30 percent, Norris said. FMC Inc. restructured its operations worldwide and was forced to cut jobs. But North Carolina facilities suffered the least because FMC closed a butyllithium plant in Texas and consolidated those operations in Bessemer City, Norris said.

Last year, the U.S. government also stepped up investment in clean energy technology, including lithium ion batteries, Fitch said. The CLEAR facility has a \$3 million grant from the U.S. Department of Energy to advance battery technology with a proprietary product known as stabilized lithium metal powder (SLMP).

If SLMP becomes the chemistry standard selected by the industry for large format batteries, FMC Lithium and Gaston County stand to benefit as the market for electric vehicles grows around the world. Norris said that could mean more manufacturing and research jobs in Bessemer City.

"There is a lot of funding for lithium ion batteries," said Christopher Woltermann, director of the CLEAR facility. "The people that come up with the right technology are probably going to grow quickly."

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