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BMW Carbon Lets Vehicles Follow Road Bicycle to Lightness: Cars
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By Chris Reiter

June 15 (Bloomberg) -- Bayerische Motoren Werke AG is spending \$100 million to gain an edge on German luxury rivals by entering the commodities business.

BMW is building its own carbon fiber factory, the first carmaker to do so, to secure supply of the lightweight material and lower expenses by refining the production process. Even though carbon fiber has cost 20 times as much as steel, BMW is embracing the material to reduce the weight of its electric cars and counteract the added heft of their batteries.

Daimler AG's Mercedes-Benz and Volkswagen AG's Audi have joined BMW's pursuit of the material, which is 50 percent lighter than steel, as they strive to meet tighter environmental rules. BMW has partnered with SGL Carbon SE, the only Europe-based producer of the material, to build the plant, prompting VW to buy 9.9 percent of SGL to ensure its own access. The battle has made SGL the world's most expensive carbon-fiber company.

"The capacity to produce carbon fiber isn't that big, so manufacturers are looking to secure access," said Robert Outram, program manager for automotive chemicals with Frost & Sullivan in Oxford, England. "There are not many people who do it well. It's a long-term strategy play."

VW's SGL investment prompted Susanne Klatten, a member of the Quandt family which is BMW's largest shareholder, to raise her SGL holding to 27 percent from 24 percent. The Wiesbaden, Germany-based company's price-to-earnings ratio of 43 is double the value of rivals Toray Industries Inc., Teijin Ltd. and Hexcel Corp.

Weight Concerns

Weight is a top concern for high-end carmakers. Much of their profit is generated by big cars, which tend to burn more fuel than smaller models. Mercedes's \$91,000 S-Class tips the scales at 4,500 pounds and gets 25 miles per gallon on the highway, compared with 33 miles per gallon for the 3,300-pound Toyota Camry. Electric vehicles add further pressure to reduce weight because of the batteries.

"In electric-mobility, the weight of the car will be a decisive factor," BMW Chief Financial Officer Friedrich Eichiner said. "There is a close correlation between low vehicle weight and range in electric cars."

Carmakers have also in the past avoided carbon fiber because the parts require drying times that aren't currently compatible with the pace of assembly lines. Planemakers including Boeing Co. started using the material much earlier because they produce at a slower rate and have simpler structures to form out of the reinforced plastics.

Because of its light weight, the cycling industry has been using carbon fiber since the 1980s. The material helped Greg LeMond win the Tour de France three times.

BMW Electric Cars

Carbon fiber for BMW's i3 battery-powered city car, due in 2013, and its i8 hybrid sports cars will be made at a factory in Moses Lake, Washington, about 180 miles east of Seattle. The plant will start production in the third quarter and will have an initial capacity to make 1,500 tons of carbon fiber, which will then be processed into components in Germany.

Daimler is following suit by building a facility in Esslingen, Germany, which will start producing parts for the \$102,600 SL roadster next year. The joint venture with Tokyo-based Toray is part of Daimler's goal of reducing vehicle weight by 10 percent with each new generation. The company estimates that trimming a car by 100 kilograms (220 pounds) reduces carbon-dioxide emissions by eight to 10 grams per kilometer.

Daimler and Toray are investing 825,000 euros (\$1.2 million).

Audi, which uses the material in the R8 sports car and RS3 sporty compact, has joined with Voith GmbH to create tools for mass-producing carbon-fiber components. Voith, in turn, is the third-largest shareholder of SGL.

Formula One

Until BMW's push, the use of carbon fiber in the auto industry was limited to Formula One race cars and exotic high-performance brands like VW's Lamborghini and Bugatti. Tata Motors Ltd.'s Jaguar plans to build the chassis for the 700,000-pound (\$1.15 million) C-X75 supercar out of carbon fiber.

Demand for carbon-fiber components will probably rise nine fold to \$94.1 million by 2017, according to Frost & Sullivan. Cost will continue to be a hurdle for mainstream adoption.

Carbon fiber costs about \$20 a kilogram, according to Frost & Sullivan. That compares to less than \$1 for steel. The material is also difficult to work with. The fibers need to be woven into sheets and then hardened, typically with resin. Frost & Sullivan estimates that manufacturing costs add 70 percent to the final price of carbon-fiber components.

Stuttgart, Germany-based Daimler is taking a more measured approach to carbon fiber and doesn't see a need to buy a stake in partner Toray to ward off other manufacturers.

Painful Process

"We get much more out of our concrete joint venture with them" than being an investor, Chief Financial Officer Bodo Uebber said in an interview in March.

While the long-term future for carbon-fiber in the auto industry may be promising, the process of introducing new auto technology is "painfully slow" and manufacturing parts from carbon fiber isn't yet ready for large-scale production, said Glen Liddy, a London-based analyst at JPMorgan Chase & Co.

"There are cheaper alternatives to make cars more efficient," said Liddy, who's covered SGL for more than a decade and has an "underweight" rating on the company.

"There's no need to rush into carbon fiber."

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