

Boeing Flight Boosts Carbon Fiber Hopes, Knoxville-Oak Ridge Innovation Valley Poised

KNOXVILLE and OAK RIDGE, Tenn., Dec. 18 /PRNewswire-USNewswire/ -- Researchers and entrepreneurs in the Knoxville-Oak Ridge Innovation Valley (www.knoxvilleoakridge.com) see the successful test of Boeing's 787 as the day the carbon fiber era took flight.

The Innovation Valley is home to Oak Ridge National Laboratory (ORNL), the Department of Energy's largest research center, which finds itself at the forefront of applied carbon fiber research.

The potential payoff from wider use of carbon fibers is impressive: materials with greater strength and a weight reduction of around 80 percent compared to steel. That's big news in many fields, but especially so in the car and truck industry where, by some estimates, lighter carbon fiber construction could contribute significantly to the U.S. Partnership for a New Generation of Vehicles (PNGV) goal of building 80 mpg vehicles.

Carbon fiber comes at a steep price. While all carbon fiber does not have to be aerospace grade, production even of materials used in less demanding applications remains costly - often as much as 20 times the price of steel.

The challenge is to reduce the cost of production - which is a technical and economic impasse that leaves researchers in the Innovation Valley intrigued with the potential of several cheaper feedstocks, including [lignin](#), a by-product of cellulosic ethanol production and the pulping process used to make paper.

Lignin, it turns out, can be an inexpensive feedstock in carbon fiber production.

Lignin should be in ample supply here, too, since the Innovation Valley is home to Tennessee Governor Phil Bredesen's [Biofuels Initiative](#), which includes a large-scale cellulosic ethanol pilot plant scheduled to open in January in nearby Vonore, Tn. under the management of [Genera Energy LLC](#), an arm of the University of Tennessee.

"You can use lignin to produce heat and steam," said Sam Jackson, Genera's vice president of feedstock operations. "But using it as a feedstock in carbon fiber production is obviously a much higher end use. And it helps the overall economics of the cellulosic ethanol process."

Economic developers think the stage is now set for major biofuels and carbon fiber producers to locate in the Innovation Valley.

"World-class carbon fiber expertise plus production of lignin feedstock come together here," said Jesse Smith, tech director for the Innovation Valley. "A natural link is emerging between biofuels and carbon fiber - and we have both."

That expertise includes new fabrication methods at ORNL as well as advanced testing machinery at the [National Transportation Research Center](#), which is located in the high tech corridor that connects Oak Ridge, Knoxville and Maryville.

Smith also likes the fact that the Genera facility, which will produce lignin as a by-product, does not compete with food crops for arable land. Instead, Genera will rely heavily upon [switchgrass](#), a perennial crop that Tennessee farmers have begun to produce successfully in marginal areas.

All of this is positive news for the Innovation Valley technology-led economic development consortium, which promotes workforce development, industrial recruiting and business retention throughout a five-county area, giving special attention to such promising areas as carbon fiber, advanced materials for the solar industry, nuclear component manufacturing, energy storage systems, instrumentation and bioenergy. For more information, visit www.knoxvilleoakridge.com or contact Garrett Wagley at 865/ 246-2661 or at gwagley@knoxvillechamber.com.

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