



## **DOE Announces Support for Project to Create High-Value Products from Coal**

*Federally funded project would lower cost of carbon fiber and create a higher-value use for coal, using an emission-free form of energy*

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Coal has been labeled an obstacle to achieving a cleaner environment. One project, the target of a recent Department of Energy grant, surprisingly aims to make it part of the solution.

The project, which will receive over \$1 million in federal funding, aims to develop an emissions-free process to produce carbon fiber using coal. The grant's prime recipient, Ramaco Carbon — a vertically intergraded coal resource, research and carbon manufacturing company based in Sheridan, Wyoming — will work with TerraPower, a nuclear innovation company in Bellevue, Washington, to develop the process, which could result in significant environmental benefits.

According to Randall Atkins, CEO of Ramaco Carbon, a prime environmental benefit of the project is developing higher-value uses for coal, beyond its use in power plants.

“Our company operates under a simple mantra: ‘Coal is too valuable to burn’,” said Atkins. “Through our research we are seeking higher technology uses for the carbon from coal, which will increase its value and lower the environmental footprint from its use. Every bit of coal that’s used to create an advanced product or material like carbon fiber is moving us toward a greener future, and a stronger American economy.”

Since 2015, TerraPower has been developing processes to use the heat from nuclear reactors to improve chemical and industrial processes currently dependent on fossil fuels.



“We are excited to see Secretary Perry and the Department of Energy continue to invest in new technologies to transform the country’s use of fossil fuels and to use nuclear energy in innovative ways. TerraPower’s work with Ramaco Carbon will develop processes to convert coal into needed commercial products without the release of carbon into the atmosphere,” explained TerraPower Chief Executive Officer Chris Levesque.

Josh Walter, project manager for Integrated Energy Systems (IES) and Innovation Engineer at TerraPower, explained that using CO<sub>2</sub>-free heat from nuclear can displace the emission-intensive processes currently used to transform biomass and fossil resources into usable products.

“Think of coal itself as a giant molecule, and if you heat it up it breaks into smaller parts,” said Walter. “Right now, a lot of carbon fiber is made from poly acrylonitrile (PAN), a petrochemical product. We believe we can create carbon fiber precursor using elements of coal instead, extracted by heating it with a non-CO<sub>2</sub> emitting form of energy. In the future, that might be nuclear energy. However, we can very likely get started, albeit at smaller scales, with renewable energy, today.”

Beyond developing an emissions-free process for creating carbon fiber precursor from coal, the project would also lower the cost of carbon fiber, presenting other benefits to the environment. Walter noted that carbon fiber is mostly found in expensive vehicles, such as racecars and sailboats. More affordable carbon fiber could transform transportation options with much lighter and more fuel-efficient vehicles from cars to airplanes, ultimately reducing CO<sub>2</sub> emissions.

“The major environmental grievance about coal concerns its use as a fuel to make power,” said Atkins. “There are many alternative ways that the carbon found in coal can be deployed that do not involve burning it. As this project will demonstrate, coal can ultimately help reduce CO<sub>2</sub> emissions through its use as the ‘building block’ for advanced materials like carbon fiber.”

*Ramaco Carbon is a vertically integrated coal technology company based in Sheridan, Wyoming that combines coal resources with advanced research and*



*modern manufacturing techniques to develop new advanced products from coal. The company is the lead recipient or sub-recipient on numerous Department of Energy grants, and focuses on three broad areas: coal to chemicals, coal to carbon fiber and coal to building products. For more information, visit [www.ramacocarbon.com](http://www.ramacocarbon.com).*

*TerraPower is a nuclear innovation company based in Bellevue, Washington. The company originated with Bill Gates and a group of like-minded visionaries who recognized energy access as crucial to the health and economic well-being of communities and decided that the private sector needed to take action. TerraPower is committed to activities in the fields of nuclear energy and related sciences which yield significant innovations in the safety and economics of nuclear power, hybrid energy and medical applications. TerraPower brings sustainable, affordable and safe energy to address global issues.*

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