

# Carbon is the future for coal

## Conference focuses on how to diversify state's abundant coal

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One of the loudest cries that emerges during the downturns of the boom-bust cycles that have historically driven Wyoming's economy consists of one word: "diversify."

Moving away from an over-dependence on oil, gas and coal has been a decades-long discussion that typically picks up during a bust, then peters out again with the next upswing. While expanding the state's economic base beyond energy is important, the focus now is finding new ways to diversify Wyoming's most abundant resource — coal.

The Cowboy State is the "perfect place to study and innovate" those economy-boosting breakthroughs, said Gillette Mayor Louise Carter-King on Friday in opening the Advanced Carbon Products Conference. Some of the state's leading industry, government and academic leaders gathered at the Pronghorn Center at Gillette College to discuss exactly how to get that ball rolling.

Sponsored by the NEW Growth Alliance, a consortium of economic development efforts that encompass Gillette, Sheridan and Buffalo, speakers explained how turning coal into other valuable products is the future for Wyoming coal.

"Things like coal are completely ignored or completely out of the public perception or awareness until something happens," said Robert Godby, a University of Wyoming economist and director of the school's Public Policies Center.

While coal has been a part of Wyoming's economy for more than 150 years, it still is mined for only one use — burning to create electricity. That makes it vulnerable to the market conditions that caused coal to tank over the past couple of years, he said.

Rather than trying to find new ways to burn the coal, developing new non-Btu markets is essential as renewable energy resources continue to grab a greater market share.

At the same time, Powder River Basin coal isn't going anywhere and will continue to be a large part of America's energy production portfolio, Godby said. However, likely not as dominant as the 40 percent share it held just a couple years ago.

"Despite what they might think in the media, coal isn't going anywhere anytime soon," he said. "It's certainly not growing at the rate the other sources are, but it's certainly not going away.

"In order to make this economically competitive, we have to find a way to monetize and create value (products from coal)," Godby said.

Incentivizing research to capture and repurpose carbon dioxide power plant emission and create other carbon-based products from coal is also important, he said.

"We need these incentives, but that's not the end of the story," he said. "We're still going to need some (government) support. There are a lot of potential ideas out there ... and the Powder River Basin creates a significant opportunity."

It's that potential that prompted Gov. Matt Mead to create his Economically Needed Diversity Options for Wyoming (ENDOW) initiative that was approved by the Legislature this past session, said Jeremiah Reiman, who heads up the effort.

State government reports identify diversification as necessary as far back as 1962, he said. For the most part, though, it's been all talk and little action.

"We have made some progress, but not as much (as is needed)," Reiman said. "There has been no concerted effort for a long-term strategy."

Typically, efforts have either petered out as governors changed or during good economic times and there isn't a push to continue with the work, he said. What ENDOW will do is create a 20-year strategy that will survive that.

"This ensures we act on that plan and do it in a timely manner," he said, adding that being pro-coal isn't anti-environment. "We want clean air and water and environmental protections to be there. ... What we're asking is for Wyoming to re-imagine itself."

### **Value-added**

One Campbell County example of using PRB coal to create an entirely new market is Atlas Carbon, which produces activated carbon to use in air and water filtration systems.

Company president Jim Dye said Atlas has been so well-received since ramping up its production last year that it's already secured a \$15 million loan from the state to add a second production line.

Showing how to take the area's coal and add value to it only takes some simple math, Dye said. Atlas can take \$50 worth of PRB coal and turn it into \$1,000 worth of activated carbon.

While the plant's current capacity of making 16 million pounds (8 tons) of activated carbon a year is expected to increase to about 37-40 million pounds (18-20 tons), it's a drop in the bucket to the basin's potential to mine hundreds of millions of tons of coal a year.

### **Carbonized**

Technology and the potential for research breakthroughs are more than just science fiction, and there are nearly limitless possibilities for using the carbon that can be extracted from coal, said Richard Horner, deputy director of emerging projects and technology at UW's School of Energy Resources.

“What better source of carbon than coal itself?” he asked rhetorically. Coal-fired power generation “is pretty flat from here on out, and it’s not necessarily that the demands for energy will be any less. ... It’s that they’re offset by advances in efficiency.”

Making other products from coal “is going to be the name of the game if we want to increase the portion of the pie we have in that market,” he said. “Each and every day people are finding new carbon-based materials that ... beat the performance expectations that industry wants.”

Some of the high-value carbon products Wyoming can become a leader in producing includes carbon fiber, nanocarbons, graphene, carbon-based coatings and paints, building materials, along with liquid chemicals that can be created through a refining process.

The challenge is figuring out how to make them economical and superior to what’s already available, he said, adding that “it’s very much about innovation and thinking differently about how you go about this challenge.”