

Anthracite and coal: They're different commodities

- [By Kent Jackson Staff Writer](#)

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Mining engineer Justin Emershaw of Atlantic Carbon talks about anthracite mining that is still happening in Northeast Pennsylvania, in Eckley Minners Village on Wednesday.

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Anthracite mined in Northeast Pennsylvania has the highest grade of carbon in the world and is a different product than what politicians refer to when they call for “No More Coal,” a local mining engineer said.

Justin Emershaw of Atlantic Carbon Group said most of the hard coal his company mines in Hazleton is used to recycle steel, filter water and make pigments, rubber, plastic, glass or sugar. About 8% heats homes.

“It’s a different commodity here, a niche market,” Emershaw said while speaking at Eckley Miners’ Village Museum on Wednesday during an event that was part of anthracite heritage month.

The markets that Emershaw listed pair up closely with uses that other regional coal companies, Reading Anthracite and Blashak Coal, list on their websites with one addition:

Chefs stoke ovens with anthracite in coal fired pizzerias that operate along the Eastern Seaboard and have popped up as far from the Anthracite fields as Denver and San Francisco.

Pizza makers favor anthracite because it burns hot and long with little soot.

For anthracite producers, coal fired pizza is the smallest share of their market, but it’s trendy.

Metallurgical users, such as steel makers, remain the biggest customer, accounting for about 60% of sales at Blaschak Coal, Greg Driscoll, the company’s chairman, said.

Most steel companies in the United States recycle steel by heating it in electric arc furnaces, a process that weakens the metal unless carbon is added. Steel companies prefer to inject anthracite rather than other types of coal into furnaces because of its carbon content.

Driscoll said 40 pounds of anthracite is mixed to one ton of steel in an electric arc furnace.

Making one ton of steel from iron ore in blast furnace, in contrast, requires about one ton of coal.

Compared to Atlantic Carbon, Blaschak sells more of coal for heating, which Driscoll said accounts for 30% of his sales.

Marketing helps in the residential heating business.

Customers across North America recognize St. Nicholas with a red suit and white beard on bags of coal from Blaschak.

The company features St. Nicholas because its breaker or processing plant is in the village of the same name near Mahanoy City.

“We probably have the best processing in the industry. We think we do,” said Driscoll, adding that ensuring coal is dry and the right size helps build relationships with dealers who put Blaschak coal in homes, small businesses and greenhouses.

Worldwide, anthracite filters water in municipal systems and at cleanups of polluted sites.

Across the Great Plains, beet farmers burn anthracite in kilns to refine sugar.

America produces about 2,300 tons of anthracite a year, and all of it comes from Pennsylvania, the U.S. Energy Information Agency says.

Pennsylvania’s anthracite industry employed 851 people at 36 mines in 2022, the latest year for which the agency has figures.

Six mines still employ workers .

Emershaw, a Penn State University-trained engineer who worked a year in iron mines of Minnesota before returning to Pennsylvania, referred to the mines as family operations with miners who love what they do. The mines are south of the Hazleton area where he works for Atlantic Carbon.

Atlantic Carbon only does strip mining, but Emershaw said he studies maps made by miners when deciding where to dig pits for new mining.

Some of the maps are more than 100 years old. They might be written on vellum instead of paper and 20 or 30 feet long.

Maps show different views: The variations of a coal seam zig zagging , a core sample or a full layout of passageways.

Up to eight miners worked in teams to survey the mines

Whenever Emershaw has had occasion to drill down, he found tunnels or other formations where the mapmakers drew them.

“The location is almost dead on,” he said.

In one slide that he showed his audience on a big screen in the auditorium at Eckley, a picture of a strip mine was next to a map of the area. Coal veins running through the rock in the picture met veins drawn on the map.

Emershaw enters maps and spreadsheets into computer-aided drafting software that allows him to visualize what’s in three dimensions.

He estimates how much coal is in the ground and how much rock miners would have to excavate to retrieve the coal.

In the coal lands where he works, miners who started work more than a century and a half ago have already removed 50% to 60% of the coal.

“What’s under Hazleton?” he asked before showing a map of tunnels beneath the heart of the city.

When Emershaw finds a location that might be profitable to mine, it’s time to drill.

Test borings can tell the elevation and thickness of the coal seams.

“An experienced driller can tell the change in strata by feel,” Emershaw said.

When a location looks promising, it still takes time and money before any mining begins.

Getting a mining permit takes two years, including a year-long environmental study.

Habitats for endangered bats can derail mining plans. Emershaw said he learned about their roosting habits from environmental studies.

Mining companies post bonds so even if the operation went bankrupt the bond would pay to reclaim the deepest pit possible on the permitted site. Bonds cost \$2.50 or \$3 per cubic yard. Emershaw gave the example of a \$9 million bond for a project of 3 million cubic yards.

“That’s before you take one shovel out of the ground,” he said.

Drilling and blasting to break rock for the excavators costs a couple million dollars for a few million cubic yards.

Failure of companies to reclaim pits from the previous century have given strip mining its bad reputation, Emershaw said.

Current operations reclaim as they mine.

“The pit moves. As you’re mining, you’re filling in behind,” he said.

At a strip mining job in Stockton that began in 1999 and is near the end, the coal company has donated acreage for the Hazleton rails to trails and recreated two wetlands.

In Jeanesville, Atlantic Carbon helped the state extinguish an mine fire while proceeding with a strip mine project scheduled to continue through 2035.

The company also has a strip mine on Spring Mountain where Emershaw expects miners will keep working through 2032.

When designing a strip mine, Emershaw draws tiers or benches in the sides to guard against landslides.

During a question-and-answer session after his talk, people in the audience asked about water runoff. Emershaw talked about diversion efforts but said the Jeddo Tunnel dug in the 1890s to drain deep mines in much of the Hazleton area still carries water out of the strip mines.

Jeddo Tunnel is the largest source of acid mine drainage in the Hazleton area. Into Little Nescopeck Creek, which flows to the Susquehanna River, the tunnel pours 40 million gallons a day — or several times that during floods — of water that kills aquatic life and carries aluminum, manganese and iron.

Led by Mike Korb, the dean of mining engineers in the region, other engineers, state lawmakers and local officials have explored building a plant to treat some of the water carried by the tunnel. The scope of the job means the plant will cost tens of millions of dollars, which Korb suggested might come from an infusion of money that Pennsylvania will get for 15 years from the federal infrastructure bill of 2021.

The tunnel water presents a challenge to local environment.

Globally, the environmental challenge that coal presents comes through the air.

Burning coal and other fossil fuels releases carbon and creates a greenhouse effect on the earth's climate.

Average global temperatures for 2023 were the hottest on record, analyses by the World Meteorological Organization, National Oceanic and Atmospheric Administration and National Aeronautics and Space Administration found. Average temperatures neared 1.5 degrees Celsius above pre-industrial averages from 1850 to 1900, a mark that the Paris Climate Accord of 2015 hoped to avoid.

Scientists at those organizations said climate is warming more rapidly than anticipated from carbon emissions, meaning the chants of "No More Coal" that Emershaw referenced in his talk could become more common.

Despite that, anthracite companies foresee a future.

Emershaw said Atlantic Carbon, which has 173 workers, mined 360,000 tons in 2023 and expects to push production to 400,000 this year.

Prior to the war between Russia and Ukraine, imports from Europe dropped prices for anthracite to about \$120 a ton.

Since war began and supplies from Europe fell, Anthracite prices went to \$220 to \$300 a ton.

Anthracite for heating, Emershaw said, can cost \$350 a ton, whereas the price for industrial uses is \$275 a ton.

Building on established roles in making steel and filtering water, coal companies search out other uses for anthracite.

Driscoll, the chairman at Blaschak Coal, said the hunt for rare earth elements, needed for smart phones, touch screens and storage batteries, hasn't found promising concentrations in piles of waste coal or culm or mine drainage in anthracite fields.

Researchers are checking clays and soils around coal seams for rare earths now.

"We are investigating other applications," Driscoll said.

One he mentioned is whether it's possible to turn anthracite into graphene, a material of layered carbon that is strong and conducts electricity.

"We're bullish," Driscoll said more generally, "on the long-term possibilities."

Contact the writer: kjackson@standardspeaker.com; 570-501-3587