

Inside Climate News

Coal Mining Emits More Super-Polluting Methane Than Venting and Flaring From Gas and Oil Wells, a New Study Finds

So much methane is released from coal mining, the Global Energy Monitor says, that it exceeds the carbon dioxide emissions from burning coal at over 1,100 coal-fired power plants in China.

By [Phil McKenna](#)
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Methane emissions from coal mines worldwide exceed those from the global oil or gas sectors and are significantly higher than prior estimates by the Environmental Protection Agency and the International Energy Agency, a new [Global Energy Monitor report](#) concludes.

“The numbers just aren’t adding up,” Ryan Driskell Tate, the report’s author, said of coal mine methane emission estimates when compared to those in prior reports. “It’s an area that has dodged a lot of scrutiny.”

Coal mining emits 52 million metric tons of methane per year, more than is emitted from either the oil sector, which emits 39 million tons, or the gas industry, which emits 45 million tons, according to [the report](#), published Tuesday.

Methane, the primary component of natural gas, is a potent greenhouse gas and the second leading driver of climate change after carbon dioxide. On a unit-per-unit basis, methane is more than 80 times as powerful at warming the planet as carbon dioxide over its first 20 years in the atmosphere. The gas slowly accumulates in coal seams as organic matter is converted to coal, a process that can take millions of years.

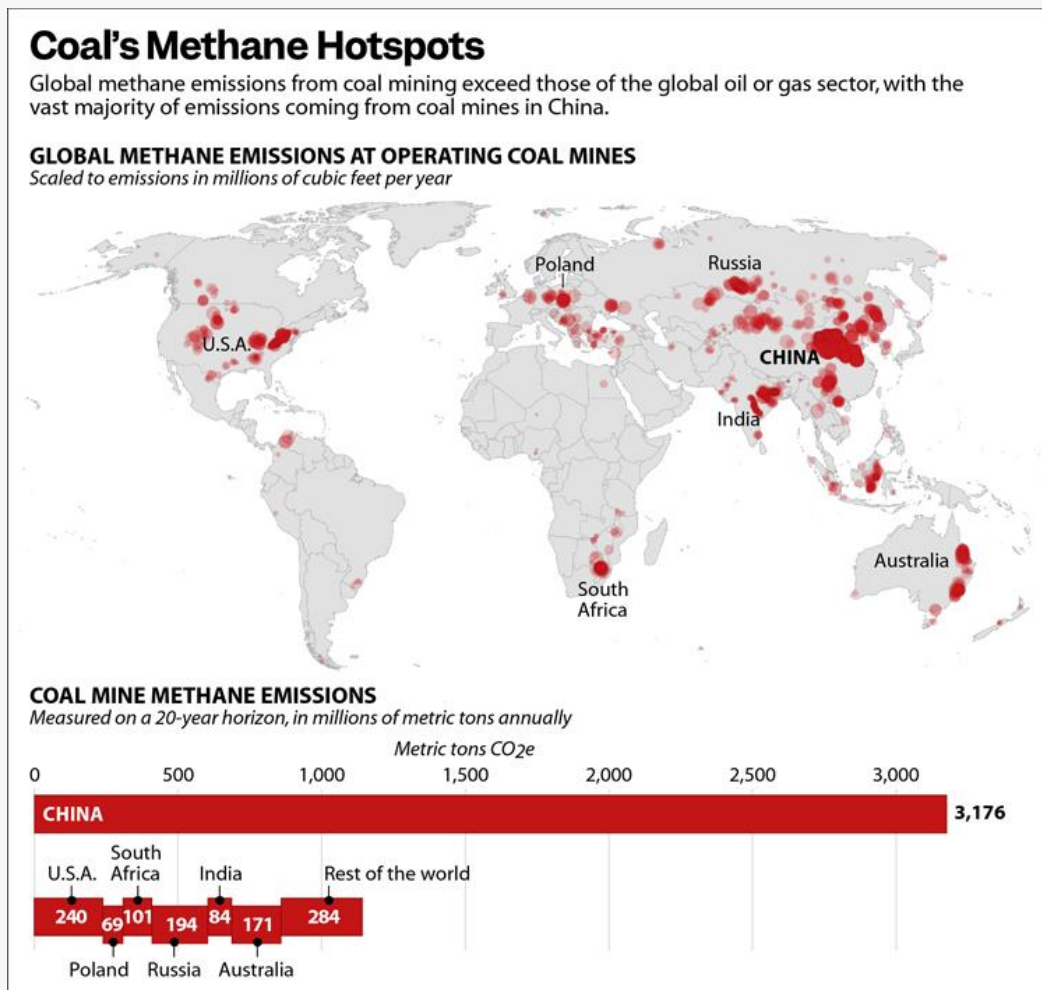
Methane emissions from coal mining worldwide are comparable to the vast carbon dioxide emissions from burning coal at [over 1,100 coal-fired power plants in China](#) over the near term, the report concludes. China, the world’s largest greenhouse gas emitter, derived [more than 60 percent](#) percent of its power in 2020 from burning coal, compared to about 19 percent in the United States.

“We all know that the oil and gas industry emits a lot of methane and that coal plants in China are a major source of CO2 emissions,” said Driskell Tate, the energy monitor’s project manager for its Global Coal Mine Tracker. “The most surprising thing about this report is just realizing that coal mining has a comparable climate impact.”

Measurements From Thousands of Coal Mines

Measuring emissions from approximately 2,300 coal mines in operation worldwide, the Global Energy Monitor report found emissions were 50 percent higher than a 2019 estimate by the EPA and 20 percent higher than an estimate earlier this year by the International Energy Agency. Both the EPA and IEA estimates relied on national averages rather than more specific figures from individual mines.

Other prior estimates for global coal mine methane emissions were even higher than those in the current report. However, the Global Energy Monitoring report is the first to take a detailed look at emissions from individual mines.



SOURCE: Global Energy Monitor; Global Coal Mine Tracker

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The current analysis drew data from the organization's Coal Mine Tracker, a database that includes detailed information on nearly all coal mines worldwide, including the type and volume of coal extracted from each. The database also includes the depth of each mine, which can play a key role in how much methane a mine releases.

“One of the biggest contributions of this report is the level of detail and information that they provide about individual coal mines across the globe,” said Scot Miller, an environmental health and engineering professor at Johns Hopkins University. “If we want to mitigate these emissions, we need to know more than country level emissions. We need to know where these mines are, and how much methane is coming out of each mine so that we can develop effective mitigation strategies.”

The information on individual mines was combined with the Model for Calculating Coal Mine Methane, a method of calculating emissions developed by researchers at the Pacific Northwest National Laboratory, the EPA and other industry experts. The report found that some high-emitting mines can emit 67 times more methane than similarly sized mines.

China’s Vast Emissions From Coal

China is far and away the leading source of coal mine methane emissions, the report said, warning that additional mines currently under development in China and other Asian countries will fuel additional warming.

Miller said the report’s information on the projected emissions of proposed mines or mine projects currently under development could help guide climate policy in China and other countries. Countries could, for example, pursue mines with lower projected emissions or focus on capturing methane emissions for electricity generation or heating projects from mines with higher projected emissions.

Capturing methane emissions from coal mines for use in energy production or heating has proven more difficult than similar emissions from the oil and gas industry because the majority of emissions are more diffuse. China set ambitious targets to capture and use methane from coal mining by 2015. However, a study published by Miller in 2019 found [China was not meeting its targets](#).

That study only looked at emissions through 2015. Miller said that “the jury is out” on whether policies in China have been more effective at reducing coal mine methane emissions in more recent years.

Stefan Schwietzke, a senior scientist with the Environmental Defense Fund and a science advisor for the United Nations Environment Program’s recently launched International Methane Emissions Observatory, praised the study’s look at individual mines. He said actual emissions data from individual mines would provide an even clearer picture of coal mine methane emissions and is working on a study for UNEP that would do just that.

The current report notes that the best way to reduce methane emissions may be to simply stop opening new mines and shut down existing mining operations. However, the report also notes that even closed mines can continue to be a significant source of methane emissions.

While the U.S. and other developing countries are rapidly phasing down coal use, developing countries continue to rely heavily on it, the dirtiest fossil fuel, which has contributed more to global warming than either oil or gas.

“What we often forget about, in many other countries outside of the United States coal is still the primary source of electricity, especially in countries like China and India,” Miller said. “Beyond what we do in the United States or Europe to mitigate greenhouse gas emissions, we really can’t forget about emissions problems like tackling methane from coal mining in other countries.”