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## Coal Use Rising Internationally, Environmentalists Must Shape Its Course

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By [Dan Vermeer, Ph. D.](#), and [Josh Seidenfeld](#)

No one expects environmentalists to love coal. Most of us know the black rock is among the planet's biggest sources of carbon, mercury, and other pollution – and that's without even looking at the destructive methods of coal mining, such as mountaintop removal.

So it should be cause to cheer that coal-fired power generation in the US is [waning](#), some major miners are [moving away from mountaintop removal](#), and US coal production [declined](#) last year.

And some environmental groups have certainly begun celebrating "[killing coal](#)" in the US.

Not so fast.



While some coal executives decry Obama and his EPA as enemies of their sector, most observers also recognize

the real culprit as [cheap natural gas prices](#). Cheap gas means the geriatric fleet of US coal plants now undergoing retirement will be replaced with natural gas plants. But natural gas is currently only this cheap here at home, and with high gas prices in Asia and Europe, the world's other major economies [continue to demand coal](#) from the US and the rest of the world. The International Energy Agency [predicts](#) coal will be the world's top energy source by 2017 – bigger than oil, bigger than gas. This international growth is a boon for US coal producers as a whole, but [coal is a strongly regionalized commodity](#), so the story of coal plays out differently in different regions: Appalachia tells a story of [long decline](#) and [environmental impact](#), and Wyoming's Powder River Basin showcases the 21<sup>st</sup> century coal industry's [mega-mines](#) and trend toward [lower-quality](#) coal.

As much as environmentalists would like to celebrate victories toward “[killing coal](#)” in the US, we cannot bury our heads in the sand and pretend world coal generation will decline soon. Many imagine that renewable power and natural gas will render coal obsolete, and they may – in 50 to 100 years. For the foreseeable future, coal [will continue to power](#) much of the global economy. With that difficult truth established, the most pressing task for environmentalists is to ensure that coal is mined and used in a way that is least harmful for the environment.

Based on current research from Duke University's [Center for Energy, Development and the Global Environment](#) and [Center on Globalization, Governance and Competitiveness](#), here are a four areas environmentalists can focus on as we apply a clear eye to shaping the future of coal:

**Rethinking Thermal Power Generation:** The steam generation plants we currently use to derive electricity from coal are based on technology invented in [the 1880s](#). There absolutely has to be a better way to wring energy from coal than just setting fire to it, and investors and entrepreneurs are pursuing that prize. For example, [NET Power](#) is commercializing a new class of power generation technology that is more efficient, can run without water, and produces no wasted emissions. By carefully controlling the gasses used in combustion, NET Power's technology aims to bring a precision to fossil generation that makes previous fossil power plants look like Bronze Age relics.

While NET Power's revamp of the whole power plant concept has the sex appeal of an electric sports car, its economics are (like the first Teslas) as yet unproven. Meanwhile, others are at work designing the decidedly less sexy but possibly more pragmatic “Prius” of coal plants known as [integrated gasification combined cycle \(IGCC\)](#) plants with [carbon capture, use and sequestration \(CCUS\)](#). Like the first Priuses, these plants can at first blush appear impractical and overpriced, but they can deliver [higher efficiency and/or overall emissions reductions](#) including [CO<sub>2</sub> reductions of 85-95%](#).

[LP Amina](#) specializes in helping existing coal plants wring profits from gaining efficiency and making money from outputs that were previously thought of as waste streams. According to LP Amina CEO Will Latta, even seemingly minor gains can have major effects: “We see a lot of waste in power plants. If you can pick up 1-2% in efficiency improvements or add another revenue stream, that's a big deal.”

**Better Pre-Treatment, Scrubbing and CCUS Technology:** While they come at significant costs, advances continue in treating coal to remove pollutants before combustion and in scrubbing emissions after combustion. CCUS (Carbon Capture, Use and Storage) technology to minimize coal CO<sub>2</sub> emissions is also advancing, with economics driven by the fact that carbon can be sold as an increasingly valuable commodity. Currently, the most [compelling cases](#) for CCUS involve using CO<sub>2</sub> from coal emissions to enable more oil to be pumped from the ground. So the [cost-benefit calculation](#) here is complicated, but CCUS can't be ignored, especially as entrepreneurs develop new ways to profit from supplies of CO<sub>2</sub> beyond oil drilling. Currently, projects are in place to use captured CO<sub>2</sub> to make [cement](#) and [agricultural products](#), and even to grow [algae](#) for fuel.

For an elegant treatment of the prospects for CCUS (along with a coolheaded assessment of [geoengineering](#)), we

recommend Marc Gunther's Kindle Single, "[Suck it Up](#)." In an [interview](#), he sums up environmentalists' recent support of the Texas Clean Energy Project coal plant: "They understand there's lots of coal in the ground here in the US...There's very little reason to believe companies will leave that coal in the ground, so [environmentalists are] trying to figure out if this idea of 'clean coal' or 'low carbon coal' can work."

**Non-Generation Uses for Coal:** Veteran environmental lawyer David Wooley, who spent much of his career fighting new coal plants and now advises energy efficiency businesses, sees economic waste as one of the real tragedies of coal. "It just seems to me that it's crazy for the US to be burning up all its coal reserves in just 2-3 generations" Wooley said to us in a recent conversation. "And wasting a lot of it."

Other uses for coal – as a feedstock for [chemicals](#) and materials for example – could eventually displace burning coal for electrical generation as we come to see the substance as too valuable to burn. Coal has long been used to make steel, and in recent years fly ash from burning coal has shown [promise](#) as a feedstock for concrete. But more promising from an environmental perspective is the prospect of keeping coal's carbon out of the air by doing things with it other than burning it. The chart below, from [IHS Global Insight](#), shows that coal can be processed to make many of the building blocks of today's chemicals and materials industries. The challenge will be to make the processes economic and environmentally benign, and Chinese players have to date shown the most activity – at least toward the goal of economic feasibility.

**Cooperation and Innovation:** In order to remain economically and environmentally viable, players in the coal value chain must work in concert toward the bold innovations that will be its lifeline. There is some evidence of progress so far, according to Gary Gereffi, Director of the Center on Globalization, Governance & Competitiveness at Duke University, which has just produced a [new report](#) on the U.S. coal value chain with an emphasis on coal-related technologies being generated by diverse companies along the value chain.

"Innovation in many contemporary global industries is coming from collaboration among firms that occupy different positions along the value chain, and the coal industry is no exception," Gereffi told us. "Major U.S. coal firms are already benefitting from partnerships established with other technology companies that are linked to the coal value chain, and this trend could accelerate in the future."

Fostering collaboration and innovation among coal companies, and helping coal value chain players to align incentives, could have deep resonance for environmentalists. If coal players do not innovate, their industry will likely continue to sputter along without developing new ideas. Environmentalists may force some power plants or mines to clean up through policy, but the global path for coal will be toward a lot more of the same. Environmentalists have an opportunity to help the coal industry to evolve and find a stronger business vision – one with a brighter environmental and economic future. The more that environmentalists can work with mining, power generation, and chemical industry coal players to imagine and realize a new future for coal, the better off we all will be.

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March 29, 2013

### Sandy Tung says:

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Yes, unfortunately coal use will continue to rise, especially in countries outside of the US and Europe. I would also like to see coal gone but it's just not going to happen. Environmentalists should work with industry and policy makers to try to make the best of this situation and develop clean coal technologies - coal gasification, IGCC, CCS, Fischer-Tropsh etc., instead of just outright opposing all uses for coal.

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March 27, 2013

### Roger Faulkner says:

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I am pursuing a tangential idea (for me) on underground coal gasification, not in coal seams, but in caverns. It is easier to control mercury and sulfur if it is removed during devolatilization/pyrolysis of the coal. Part of me wants to see coal use disappear, and a carbon tax would wipe out the most egregious uses of coal (in direct combustion), but coal will have

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a role for many years, even if it becomes limited to chemicals & making steel.

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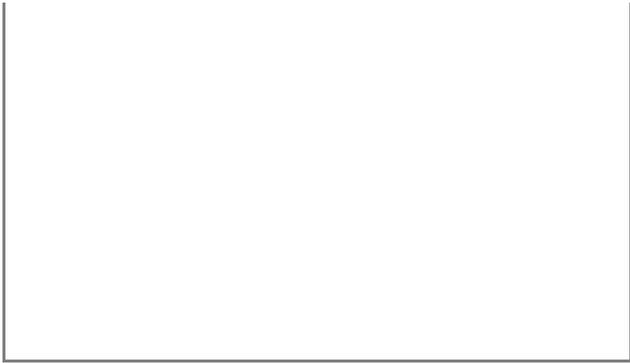
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**Geoffrey Styles** is Managing Director of GSW Strategy Group, LLC and an award-winning blogger. [More »](#)



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