

THE BIG SWITCH Penn State's conversion from coal to natural gas

By Samantha Cressman | Collegian Staff Writer

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John Baranoski

The West campus steam plant on Burrows Road on Tuesday, April 14, 2015. The steam plant is in the middle of a multi-year conversion from coal to natural gas.

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During the winter, the temperature dropped to 20 degrees below zero, but inside Penn State's campus buildings the heat never stopped. "The fact that the lights come on when you expect them to, the fact that the heat is there when you expect is due to this infrastructure that's been built and improved on over the years," Superintendent of Steam Services Paul Moser said. To heat the campus, Penn State uses a steam system generated by burning coal at the West Campus Steam Plant and East Campus Steam Plant. Many Penn State students may not realize how much work goes into keeping the campus running, Moser said. For instance, when a light switch is flipped on, it's not magic, but a coal-burning plant located in Shawville — an hour away from State College — illuminating the room. Penn State has been relying on coal to heat and electrify its campus for years. The fossil fuel has been the main source of energy, but that is all going to change.

In 2005, Penn State's Office of Physical Plant began an energy conservation program. The goal is to reduce Penn State's energy emissions by 35 percent by the year 2020. As of 2013, emissions have been reduced by 18 percent. The university is currently in the midst of the three-year plan to convert West Campus Steam Power Plant from coal to natural gas by 2016. Once the conversion is complete, Penn State will be running completely off of natural gas for heating and partially for electricity. "Having a [natural gas] power plant in place is actually very forward looking," said Alex Novak, head of communications at the Sustainability Institute and OPP. "It's much more efficient."

Drilling for natural gas

There are currently 7,788 active gas wells spread across 34 counties in Pennsylvania. The wells travel between 5,000 to 9,000 feet below the surface into the Marcellus shale, a unit of sedimentary rock with pockets of natural gas crammed between its cracks.

The wells are using a method called hydraulic fracturing to extract the natural gas from the shale — a process of extracting natural gas from the ground by pumping gallons of water, sand and chemicals to fracture, or break, rock thus releasing the gas.

With drilling taking place around the state, “fracking” has become a buzzword, but that’s not necessarily where the trouble is, said David Yoxtheimer, an extension associate at the Penn State Marcellus Center for Outreach and Research.

“There are a lot of concerns about water resource impacts from drilling,” Yoxtheimer, a hydrologist, said. “What we’ve found is in most cases people associate hydraulic fracking as an umbrella term for the whole process, but the reality is [fracking] is one part of the process and not necessarily where most of the risk lies.”

Yoxtheimer, who researches water treatment and quality related to the natural resources of the Marcellus shale, said there is no case where hydraulic fracking has directly contaminated water supply and of the almost 8,000 wells in Pennsylvania, there have been only 20 documented cases of methane gas entering the groundwater.

“I’m not trying to minimize that,” he said. “One case is one too many, but drilling into the Earth has some inherent risks with it.”

There is also the idea fracking is using all of Pennsylvania’s water supply, he said. While roughly 72 percent of the water used for drilling comes from lakes, streams and groundwater, it is only a small percentage of the 9.5 billion gallons of water Pennsylvania uses daily.

The average American family uses 300 gallons of water daily for a various reasons. A fracking well uses approximately 4.4 million gallons of water — equivalent to the amount of water State College residents use in one day total.

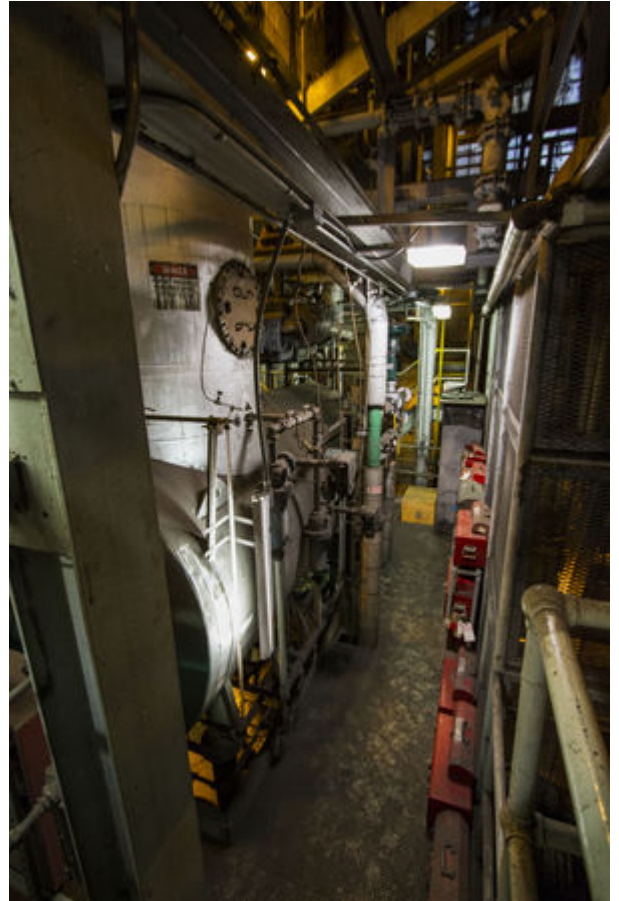
“What we found is the industry withdraws about .1 percent of the water in the state on any given day,” Yoxtheimer said. “There’s a perceived risk that we are going to dry up our streams and rivers when the reality is that only a very small percentage ... of the water being used in Pennsylvania is going toward [hydraulic fracking] activity.”

The real concern is spillage of chemical fluids at the surface, Yoxtheimer said. When the natural gas is being drilled, flowback returns with it. The flowback is laden with chemicals used during the process. If not handled properly, the flowback can spill onto the well pad and seep into the ground or nearby stream. To prevent the problems from happening, regulations need to be put in place, but regulations are improving and being enforced in Pennsylvania, Yoxtheimer said.

“You can manage the risk and minimize the impacts,” he said.

Karen Feridun, a member of the steering committee for Pennsylvanians Against Fracking, disagrees.

“It’s unsafe, and it can’t be done safely,” said Feridun, founder of Berks Gas Truth. “The big issue we have, ultimately, is that you just can’t regulate yourself into a safe practice. The real solution is to stop it.” Pennsylvanians Against Fracking is a coalition formed last summer by various anti-fracking groups to convince Gov. Tom Wolf to put a moratorium on fracking and eventually ban the practice altogether, Feridun said.



When Wolf took office, the coalition was hopeful for change to take place, but has been disappointed with the governor's stance on fracking, she said.

In March, Wolf proposed a 5 percent severance tax to be placed on drillers, plus 4.7 cents per thousand cubic feet. The governor projects the tax will bring in \$1 billion per year, which will be put toward funding public education.

Feridun said the tax will only further institutionalize fracking, making it more difficult to ban the practice. There is also the perceived notion fracking will create jobs, she said, but the jobs are temporary and many times employ out-of-state.

"People are cynical and use talking points to manipulate the public that there are going to be jobs," Feridun said.

According to the Energy Information Administration, nationwide the fracking industry created only 569,000 jobs in 2012.



Reducing the carbon footprint

The university's natural gas supply is distributed by Columbia Gas of Pennsylvania. The company operates 174 miles of pipeline in the state and 74 miles in State College, alone, Novak said.

The pipeline is part of a bigger network of natural gas pipeline running across the United States.

"Some of the gas comes from Marcellus shale, but it doesn't all come from there," said Russ Bedell, communications manager for Columbia Gas of Pennsylvania.

Due to the spider web of pipeline crawling throughout the country, there is no way to tell where exactly the gas is coming from, Novak said.

Although according to ProPublica, nine out of 10 gas wells in the United States use hydraulic fracturing for natural gas extraction.

The decision to run off of natural gas is partially from a push by the Environmental Protection Agency.

In January 2012, The EPA finalized its Boiler MACT, which controls the amount hazardous air pollutants a boiler can emit. The best solution to comply with the law was to convert the plant to natural gas, Moser said.

"No question this [conversion] is the best value for producing energy," he said.

On average, the West Campus Steam Power Plant burned about 75,000 tons of coal per year, Moser said.

During the conversion to natural gas, the plant cut the number in half last year only burning 35,000 tons.

Natural gas emits about 50 percent less carbon dioxide than coal. The switch to natural gas will reduce the carbon emissions by 100,000 tons, Moser said, and eliminate the traffic caused by 3,000 trucks — about 15 to 20 daily — transporting coal to the plant per year.

Richard Alley, Evan Pugh Professor of geosciences, said the conversion to natural gas will conserve and cut usage of fossil fuels, which is a step in the right direction for a sustainable future.

While natural gas is an improvement over coal, it still comes at an environmental price, but it is a step toward a more sustainable campus, Novak said.

“I think there’s a lot of places where we can inject innovative solutions into existing systems, but we can’t forget what system is in place because the reliability to the folks who live here is very important,” Moser said.

The long-term goal is to run off wind and sun — the world’s biggest renewable resources available, Alley said.

“It’s possible for the whole world to run off of sustainable energy and eventually we have to,” said Alley, who won the 2007 Nobel Peace Prize for his work on the United Nations Intergovernmental Panel on Climate Change. “It is not a question of do we have to find renewable energy sources — it is only a question of when.”



Building a sustainable future

As Penn State continues its process of cleaner emissions, some Penn State students are questioning if the university is doing enough.

“While we applaud the university’s efforts to reduce its carbon footprint and energy production, we would like for Penn State to reduce its investments in the fossil fuel companies,” said Nathan Larkin, former Daily Collegian reporter and Fossil Free PSU’s President.

Fossil Free PSU is a student organization whose goal to have Penn State ultimately divest from fossil fuel companies.

As of December 2014, the university’s Long Term Investment Pool is approximately \$3.4 billion — \$2.3 billion in endowed funds and \$1.1 billion in non-endowed funds, Penn State spokesman L. Reidar Jensen said via email.

Investments are made by independent investment managers, selected by the Penn State Investment Council, and are placed in mutual-style funds with various holdings.

Penn State, as an institutional investor, cannot dictate what investments are made to which sector — the power is held solely by the fund managers, Jensen said.

Because of this, Jensen said it’s not possible to track down a specific amount of money invested into any particular sector, but Larkin (sophomore-communication arts and sciences) said he believes the number invested in the fossil fuel industry is significant.

Investments in the fossil fuel industry is losing the university money, Larkin said.

According to the 2014 S&P Capital IQ Study conducted by McGraw Hill Financial, a \$1 billion endowment without fossil fuels is more profitable. Based off the study, Larkin estimates the money the university would save from divesting could fund roughly 6,000 yearly in-state scholarships. “If they are truly interested in environmental stewardship and mitigating climate change, then divesting from fossil fuel companies needs to be the next move in addition to reducing the carbon footprint,” Larkin said.



President of Eco Action Laura Gebhart said the conversion to natural gas is a gray area for the organization. It is a difficult balance between the environmental impacts and economic benefits of natural gas, Gebhart (senior–community, environment and development) said.

Eco Action’s goal is for the university to move away from fossil fuels and run on only sustainable energies, but Gebhart said it not an attainable goal at this point.

Right now, the organization would like to see more sustainable energies included in the university’s energy plan.

“If we would just devote our money to developing those areas, we could supply enough energy to do all these things, but there’s so much interest in [fossil fuels] and it’s hard to move those mountains when so many people like that stand in the way,” Gebhart said.

The university must make small steps toward a sustainable future for it to be a successful transition, Alley said.

If the university were to make the switch to renewable resources quickly, it could be a disaster and be halted by students or state legislatures due to high cost or other issues, he said.

“[Penn State] very clearly has to make decisions that take into account who’s paying for this as well as what they’re trying to accomplish,” Alley said. “For all of us together the answer is very clear: making a consistent start on switching away from fossil fuels.”

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