Union of Concerned Scientists

ISSUE BRIEF

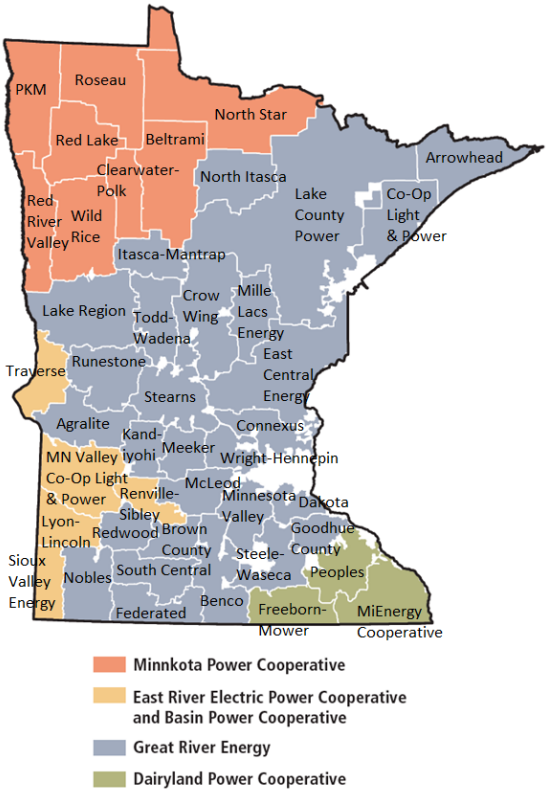
Minnesota Electric Cooperatives and Out-of-State Coal Plants

Minnesota's Electricity Sector is Transitioning but Electric Cooperatives Remain Tied to Coal-Fired Power Plants

HIGHLIGHTS

Electric cooperatives ("co-ops") serve about one-third of Minnesota customers. Yet, while many coal-fired power plants located within the state have been retired or are slated to retire, Minnesota co-ops are tied to memberships with larger co-op entities that own coal plants elsewhere and that they intend to continue operating far into the future. Many of these coal plants run for extended periods when cheaper resources are available and have long-term fuel contracts for coal supply. Meanwhile, existing power supply contracts restrict the ability of local Minnesota co-ops to pursue alternative resources, such as renewable energy. To allow full clean energy benefits to flow to Minnesota co-ops, policymakers and stakeholders must continue exploring solutions to help facilitate coal plant retirements and increased use of clean resources.

FIGURE 1. Minnesota Co-Ops by Primary Power Provider



SOURCES: CHAN ET AL. 2019; MREA N.D.

Minnesota's electricity generation mix is shifting away from coal. Due to pressure from low natural gas prices and competitive costs for wind and solar power, coal plants are increasingly uneconomic options. In recent years, nearly 1,000 megawatts (MW) of coal generating capacity has been retired in Minnesota, about 20 percent of the state's total.[1]

Looking ahead, the state's largest investor-owned utility, Xcel Energy, has plans to retire all its Minnesota coal-fired power plants by 2030. Another utility, Otter Tail Power, will retire its only Minnesota coal plant by 2021. And although a third utility, Minnesota Power, has not yet announced a retirement date for the remaining coal units at its Clay Boswell plant, it has mothballed or retired smaller units at that facility and at Taconite Harbor.

This trend is helping Minnesota reduce carbon emissions from the power sector and expand opportunities for renewable energy development. Renewables generated close to 25 percent of the state's electricity in 2017, while production from coal dropped to 39 percent in 2017 from 59 percent in 2007.[2]

Yet, a substantial amount—roughly 30 percent—of Minnesota's electricity consumers are not served by the investor-owned utilities mentioned above but rather by a different type of provider known as an electric cooperative, or "co-op." These local co-ops receive power from larger co-ops that own and operate transmission lines and power plants—including coal-fired facilities in North Dakota, Wisconsin, and Wyoming.

For the most part, these larger co-ops that directly own the coal plants have no plans to retire them[3] and instead have long-term coal fuel contracts and lengthy, all-encompassing power supply contracts with their customer co-ops. This limits Minnesota

local co-ops' ability to benefit from the clean energy transition underway in the state and elsewhere. To rectify this situation, co-op leaders and state policymakers must continue exploring solutions to facilitate movement of this electric utility sector toward clean energy.

What Are Electric Co-ops?

Along with investor-owned utilities and municipal utilities, electric co-ops are entities that provide electricity service in the United States. Many co-ops were formed during the push for rural electrification in the years before and after World War II. The nonprofit co-op model brought power to many places that would not have received investment from privately owned utilities, and the consumer-owned, democratic, and locally run model still serves electricity consumers today.

In Minnesota, there are 45 co-ops serving homes and businesses (Figure 1). They range in size from serving as few as 2,000 customers to more than 130,000 (MREA n.d.). Electric co-ops serve 30 percent of Minnesota customers, represent 22 percent of electricity sales in the state, and cover 85 percent of the state's land area (Chan et al. 2019).

Most Minnesota co-ops do not own generation resources or large transmission lines and thus are known as distribution co-ops. Historically, it would have been prohibitively expensive for each distribution co-op to build its own power plants and long-distance power lines, so they banded together to form other entities known as Generation & Transmission (G&T) co-ops. G&T co-ops build power plants and transmission lines and sell power to distribution co-ops, which are often located in multiple states. Many distribution co-ops signed long-term power supply contracts with the G&T co-ops, which allowed financing for infrastructure such as power plants and transmission lines.

The G&T co-ops that own power plants with Minnesota distribution co-op members are: Basin Electric Power Cooperative, Dairyland Power Cooperative, Great River Energy, and Minnkota Power Cooperative (Figure 1).[4] Among other generating resources, each of these entities owns coal-fired power plants located outside Minnesota, totaling just over 5,000 MW of generating capacity (Table 1).[5,6]

TABLE 1. Coal Plant Ownership

G&T Co-op	Coal Plant Name	Location	Ownership Percentage*	Owned Capacity (MW)	2018 Total Plant Capacity Factor	2018 Total Plant Carbon Dioxide Emissions (Tons)
Basin	Antelope Valley	North Dakota	100%	900	82%	7,606,192
	Dry Fork	Wyoming	93%	376	84%	3,355,250
	Laramie River	Wyoming	42%	723	71%	12,951,003
	Leland Olds	North Dakota	100%	667	58%	4,123,020
Dairyland	Genoa	Wisconsin	100%	318	61%	1,932,151
	John P. Madgett	Wisconsin	100%	393	55%	2,280,692
	Weston 4	Wisconsin	17%	167	54%	4,540,960**
Great River Energy	Coal Creek	North Dakota	100%	1,147	91%	10,452,780
	Spiritwood	North Dakota	100%	92	25%	538,577
Minnkota	Milton R. Young	North Dakota	34%	237	81%	6,036,179
			Total	5,020		

*Other co-owners include Wyoming Municipal Power Agency (Dry Fork); Tri-State G&T Association, Missouri River Energy Services, Lincoln Electric System, and Wyoming Municipal Power Agency (Laramie River); Wisconsin Public Service Corp. (Weston 4); and Square Butte Electric Cooperative (Milton R. Young).

**Aggregated for all Weston units.

SOURCE: S&P GLOBAL

Coal plants have enormous negative environmental impacts, including emissions of harmful air pollutants that contribute to costly and debilitating health effects such as respiratory and cardiovascular diseases and massive amounts of heat-trapping carbon dioxide pollution (UCS 2019). They are also increasingly expensive to operate. While many factors are making coal plants uncompetitive economically, there are at least two that could be addressed by plant owners and decisionmakers that will be examined here: uneconomic operations and fuel supply contracts.

Uneconomic Coal Plant Operations

Coal plants can often operate uneconomically, as owners can require their coal-fired power plants to run at times when it would be cheaper to purchase power from the market instead. This is especially true of plants owned by entities that can pass the costs on to their customers, including vertically integrated utilities and public power utilities such as electric power co-ops (Daniel 2018).

According to 2017 Union of Concerned Scientists (UCS) research on coal plant operations, plants owned by the G&T co-ops discussed here operate for extended periods when cheaper resources are available, resulting in excess costs to customers, referenced in Table 2 as the customer burden from overgeneration.

As low natural gas prices and cheaper renewables continue to put pressure on wholesale market prices, the plants are likely to further burden customers when operated uneconomically. The G&T co-ops could therefore adjust the way the plants are offered into wholesale markets instead of "must running" them year-round—by not running the plants as often (or retiring them) and replacing the electricity with renewables, efficiency, and market purchases.

TABLE 2. Plant Operations

Plant	Customer Burden from Overgeneration 2015–2017*
Antelope Valley	$<1 Million
Dry Fork	n/a**
Laramie River	$8 Million
Leland Olds	$2 Million
Genoa	$26 Million
John P. Madgett	$27 Million
Weston 4	$3 Million***
Coal Creek	$21 Million
Spiritwood	n/a**
Milton R. Young	$6 Million

*All values rounded to nearest million. Values aggregated to plant level and not prorated based on ownership percentage. Economic losses are evaluated on accumulated monthly losses and not offset by economic gains in subsequent months.

**n/a = not analyzed. Some plants excluded from original analysis due to lack of data, incomplete data, or other reasons; not indicative of plant economics and does not suggest plant is or is not economic.

***Aggregated for all Weston units.

SOURCE: UCS CALCULATIONS

Coal Supply Contracts

Coal plant owners purchase their coal supply in different ways. Some use purchases for immediate delivery (i.e., spot market), some use short-term contracts of five years or less, and some use long-term contracts. Recent UCS research found that nationally 90 percent of coal (weighted by heat content) is purchased via contracts that are set to expire in five years or less and that over half of all coal is purchased on the spot market (Daniel 2019a). In addition, merchant generators (i.e., independent power producers) procure two-thirds of coal via the spot market and none have any contracts longer than 20 years. In contrast, public power entities, like electric co-ops, and regulated utilities are much more likely to sign longer contracts, decisions that may have made sense in years past when coal was the cheapest option—but now result in customers being locked into buying coal for years to come (Daniel 2019a).

Except for Dairyland's plants, which use spot purchases and short-term contracts, the co-op coal plants examined here have coal fuel contracts running to 2037, 2041, 2045, and even 2071 (Table 3). Several of the plants—including Antelope Valley, Dry Fork, Leland Olds, Coal Creek, and Milton R. Young—are considered "mine mouth" plants because they are located close to the coal mines that supply them.

Collectively, these plants cost co-op consumers more than $93 million in uneconomic generation costs from 2015 to 2017. Coal supply contracts are often asserted as one reason why coal plants must continue operating even when running the plant loses money (Daniel 2019a). Coal plant owners point to these contracts as justification for operating their plants year-round, asserting that the agreements contain liquidated damages clauses requiring the plant owner to pay for the fuel regardless of whether it is taken (Daniel 2019a).

TABLE 3. Coal Supply Contracts

Plant	Location	Coal Contract Duration	Tons Purchased (2018)	Mine Mouth?	Cents/kWh (2018)
Antelope Valley	North Dakota	2037	5,278,000	Yes	1.30
Dry Fork	Wyoming	2071	1,970,000	Yes	0.77
Laramie River	Wyoming	Short/2041	6,026,000	No	1.05
Leland Olds	North Dakota	2037	2,831,000	Yes	1.62
Genoa	Wisconsin	Spot/Short	761,000	No	2.64
John P. Madgett	Wisconsin	Spot/Short	1,142,000	No	2.74
Weston 4	Wisconsin	Spot/Short	2,508,000	No	2.33
Coal Creek	North Dakota	2045	8,348,000	Yes	1.64
Spiritwood	North Dakota	2045	305,000	No	1.79
Milton R. Young	North Dakota	2037	4,302,000	Yes	1.82

SOURCE: S&P GLOBAL; UCS CALCULATIONS

Considering the small price savings associated with long-term fuel contracts, and the large liability the contracts represent in a changing market, lengthy purchase agreements and the liquidated damages clauses that accompany them can be risky for customers (Daniel 2019b). This is true even if it may have made sense to enter into the contracts at the time they were signed. Today, however, as coal plants continue to face declining competitiveness in power markets, it may be more sensible to reduce or retire plants rather than operate them uneconomically to avoid liquidated damages—and either absorb the loss or seek renegotiation of long-term supply contracts.

Challenges Facing Minnesota Co-ops Desiring Less Coal Power and More Clean Energy

As described above, Minnesota is phasing out coal-fired power plants and working to decarbonize its power sector. Yet, Minnesota has a substantial number of customers whose local co-ops are members of coal plant–owning G&T co-ops that do not have plans to close their often-uneconomic plants (aside from Dairyland's recent announcement that it will retire the Genoa plant in 2021).

Distribution co-ops are often faced with contractual barriers to decarbonizing. Many of the power supply contracts between distribution co-ops and G&T co-ops include what are known as "all-requirements" provisions, which mean that the local co-ops are committed to receiving all their power supply needs from their G&T co-ops with only limited options for pursuing supply from alternative generators or building their own resources (Chan et al. 2019). For instance, Great River Energy contracts with 28 of Minnesota's distribution co-ops, and 20 of these agreements are for all-requirements service with a carve-out option of only 5 percent for self-generation (Chan et al. 2019).

In addition to their breadth, the contracts are also long-lived. Great River Energy's all-requirements contracts mostly extend to the 2040s, while Basin Electric's run until 2075 (Chan et al. 2019). Finally, the contracts can be difficult to change due to provisions that require approval from entities such as lenders and trustees for any modifications (Farrell 2016).

These contractual arrangements mean that distribution co-ops are for the most part beholden to the generation supply choices of the G&T co-ops. The local co-ops are often prohibited from building many renewable resources themselves and cannot purchase clean energy from other suppliers either.

Of course, as member-owners of the G&T co-ops, local co-ops can and do advocate for changes in generation portfolios. But decision-making within G&T co-ops is complex: they are large organizations, often serving members across multiple states, with indirect representation of all customer co-ops (Chan et al. 2019).

Positive Steps, but Coal Remains a Barrier

The G&T co-ops discussed here are subject to certain Minnesota energy policies—such as contributing to the state's greenhouse gas reduction goals, achieving a minimum amount of renewable energy through the state's Renewable Energy Standard, and reaching certain levels of energy efficiency under its Conservation Improvement Program. In addition to complying with clean energy requirements, one of the G&T co-ops—Great River Energy—has made a commitment to achieve 50 percent renewable energy by 2030. It has also collaborated with some of its members on distributed energy projects (see, e.g., Dakota Electric Association 2019).

But Great River Energy, Basin Electric, Dairyland, and Minnkota are also keeping coal-fired power plants in their supply portfolios. The results are that Minnesota co-ops are slower to decarbonize than other electric utilities in the state and their customers are facing the risk of higher costs from uneconomic electricity generation, environmental regulations, and rising fuel costs.

Because co-ops are often located in rural areas, they have enormous renewable energy potential that could be deployed instead of coal. The benefits are numerous, including for the agriculture sector: for example, farmers and ranchers who lease land to wind power projects receive over $250 million a year in lease payments nationwide, providing a valuable income stream to balance commodity price fluctuations and weather variability (AWEA n.d.). Expanding clean energy resources can also provide jobs and tax revenue for rural communities (see generally Krishnaswami and Mittelman 2018).

What Options Are Available?

Co-ops' key features include local control and democratic decision-making. But, as discussed above, the historical evolution of power supply is an obstacle to many local co-ops' ability to choose cleaner, lower-cost options that may be available.

One path to addressing this problem is for co-ops and elected officials to put pressure on G&T co-ops to help distribution co-ops build clean energy resources and to allow more self-supply. G&T co-ops are being forced to reckon with the decline of coal—and distribution co-ops can help move them in the right direction. Indeed, distribution co-ops do have tools at their disposal to influence the G&T co-ops that supply their power. Citing its members' desire for clean energy and affordability, Tri-State Generation and Transmission Association, one of the largest G&T co-ops in the country with operations in Colorado, Nebraska, New Mexico, and Wyoming, announced plans to retire two more of its coal plants, citing also the low costs of renewable energy (Tri-State 2020). Prior to the announcement, two distribution co-ops had left Tri-State membership and two more are actively seeking exit fee determinations (Walton 2019b).

In addition, Hoosier Energy—a G&T co-op with member co-ops in Indiana and Illinois—has just announced plans to retire its 1,070 MW Merom Generating Station coal plant in 2023 as part of a new resource plan focused on reliability, affordability, and environmental sustainability. Hoosier Energy estimates that the plan will save its member co-ops an estimated $700 million over the next 20 years (Hoosier Energy 2020). Finally, as noted above, Dairyland Power Cooperative announced on January 24, 2020, that it will retire the Genoa coal plant in 2021.

Another path is continued advocacy before the state legislature and state regulators for increased oversight or other forms of relief. Although, due to co-ops' democratic governance structure, state and federal laws have not traditionally regulated them in the same way as private investor–owned utilities, co-ops are subject to state energy policy and to certain Minnesota Public Utilities Commission oversight mechanisms.[7] In Colorado, regulators took steps to increase their oversight of Tri-State's resource planning, which—coupled with pressure from member co-ops leaving or seeking to leave Tri-State—preceded Tri-State's January 2020 coal plant retirement announcement (Walton 2019a).

In order to ensure a clean energy transition for all Minnesotans, state policymakers must continue to examine options for facilitating the phaseout of coal-fired power plants owned by the multistate electric co-ops supplying Minnesota customers. Co-ops led the way for the electrification of rural America—we should ensure they can lead their customers to the benefits of a clean energy future as well.

James Gignac *is lead Midwest energy analyst in the UCS Climate & Energy Program.*

ACKNOWLEDGEMENTS

Special thanks to UCS Senior Energy Analyst Joseph Daniel for research assistance, and thanks to external reviewers with Fresh Energy and Rocky Mountain Institute, who offered valuable recommendations and feedback. The opinions expressed herein do not necessarily reflect those of the organizations or the individuals who reviewed it. UCS bears sole responsibility for the brief's content.

ENDNOTES

1 Since 2010, the following Minnesota coal plants have been retired, mothballed, or converted to run on gas: Silver Lake (2015), Black Dog (2015), Syl Laskin (2015), Taconite Harbor (2015), City of Austin's Northeast Plant (2016), City of Willmar (2017), and Clay Boswell Units 1 and 2 (2018).

2 Minnesota Department of Commerce, Minnesota Renewable Energy Update (November 2018), http://mn.gov/commerce-stat/pdfs/2017-renewable-energy-update.pdf

3 Notably, on January 24, 2020, Dairyland Power Cooperative announced plans to retire its Genoa plant in 2021.

4 East River Electric Power Cooperative is a G&T co-op but obtains power from Basin Electric.

5 By comparison, Xcel Energy (d/b/a Northern States Power) has 2,388 MW of coal capacity, which, as stated previously, the company plans to retire completely by 2030.

6 Note that, with respect to Basin Electric's Wyoming plants, Dry Fork and Laramie Units 2-3 are connected to the Western Interconnect, while Laramie River Unit 1 is connected to the Eastern Interconnect. For purposes of this issue brief, all coal plants owned by G&T co-ops of which Minnesota co-ops are members are included.

7 See Minn. Stat §216B.2422, subds. 2.(b), 2b (2019). https://www.revisor.mn.gov/statutes/cite/216B.2422.

REFERENCES

AWEA (American Wind Energy Association). n.d. "Economic Development." Accessed January 21, 2020. https://www.awea.org/wind-101/benefits-of-wind/economic-development

Chan, Gabriel, Stephanie Lenhart, Lindsey Forsberg, Matthew Grimley, and Elizabeth Wilson. 2019. *Barriers and Opportunities for Distributed Energy Resources in Minnesota's Municipal Utilities and Electric Cooperatives.* http://hdl.handle.net/11299/201624

Dakota Electric Association. 2019. "Dakota Electric Members to Receive More Renewable Energy from Newly Dedicated Solar Facility." Press release, July 22. https://www.dakotaelectric.com/2019/07/22/solar-dedication/

Daniel, J. 2018. "The Coal Bailout Nobody is Talking About." *Union of Concerned Scientists* (blog). September 24. https://blog.ucsusa.org/joseph-daniel/the-coal-bailout-nobody-is-talking-about

———. 2019a. "For Some, Coal Contracts are, 'Heads I Win, Tails You Lose.'" *Union of Concerned Scientists* (blog). October 30. https://blog.ucsusa.org/joseph-daniel/for-some-coal-contracts-are-heads-i-win-tails-you-lose

———. 2019b. "How Fuel Accounting Paradigms Influence Coal Power Plant Profitability." Abstract for presentation to the United States Association for Energy Economics. http://www.usaee.org/usaee2019/submissions/Abs/USAEE%202019%20Abstract%20JDaniel.docx

Farrell, J. 2016. "Local Utilities Have Lost Control." *Institute for Local Self-Reliance* (blog). June 23. https://ilsr.org/local-utilities-have-lost-local-control/

Hatlestad, Erik, Katie Rock, and Liz Veazey. 2019. *Rural Electrification 2.0: The Transition to a Clean Energy Economy*. https://www.cureriver.org/wp-content/uploads/2019/06/Rural-Electrification-2.0-report_CURE-1.pdf

Hoosier Energy. 2020. "Hoosier Energy Announces New 20-Year Resource Plan." Press release, January 21. https://hoosierenergy.com/press-releases/hoosier-energy-announces-new-20-year-resource-plan/

Krishnaswami, Arjun, and Elisheva Mittelman. 2018. *Clean Energy Sweeps Across Rural America.* New York: Natural Resources Defense Council. https://www.nrdc.org/sites/default/files/rural-clean-energy-report.pdf

MREA (Minnesota Rural Electric Association). n.d. "Our Members." Accessed January 21, 2020. https://www.mrea.org/our-members/

S&P Global. "S&P Global Market Intelligence." https://platform.marketintelligence.spglobal.com/

Sullivan, Joe, Mike Bull, and Helen Booth-Tobin. 2017. *Minnesota's Electric Cooperatives: Laboratories of Utility Innovation.* Minneapolis: Center for Energy and Environment. https://www.mncee.org/getattachment/Resources/Resource-Center/Technical-Reports/Electric-Co-ops-Lead-Minnesota-Innovation/CoopWhitePaper-FINAL-DRAFT.pdf.aspx

Tri-State. 2020. "Tri-State Announces Retirement of All Coal Generation in Colorado and New Mexico." Press release, January 9. https://www.tristategt.org/tri-state-announces-retirement-all-coal-generation-colorado-and-new-mexico

UCS (Union of Concerned Scientists). 2019. "Coal Power Impacts." Accessed January 21, 2020. https://www.ucsusa.org/resources/coal-power-impacts

Walton, Robert. 2019a. "Colorado Regulators Propose Rules Governing Tri-State Resource Planning." *Utility Dive*, August 5, 2019. https://www.utilitydive.com/news/colorado-regulators-propose-rules-governing-tri-state-resource-planning/560157/

Walton, Robert. 2019b. "Tri-State Faces Growing Member Rebellion, Challenges at Colorado PUC." *Utility Dive*, November 8, 2019. https://www.utilitydive.com/news/tri-state-faces-growing-member-rebellion-challenges-at-colorado-puc/566881/

Union of Concerned Scientists

FIND THIS DOCUMENT ONLINE: www.ucsusa.org/resources/minnesota-electric-cooperatives

The Union of Concerned Scientists puts rigorous, independent science to work to solve our planet's most pressing problems. Joining with citizens across the country, we combine technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

NATIONAL HEADQUARTERS
Two Brattle Square
Cambridge, MA 02138-3780
Phone: (617) 547-5552
Fax: (617) 864-9405

WASHINGTON, DC, OFFICE
1825 K St. NW, Suite 800
Washington, DC 20006-1232
Phone: (202) 223-6133
Fax: (202) 223-6162

WEST COAST OFFICE
2397 Shattuck Ave., Suite 203
Berkeley, CA 94704-1567
Phone: (510) 843-1872
Fax: (510) 843-3785

MIDWEST OFFICE
One N. LaSalle St., Suite 1904
Chicago, IL 60602-4064
Phone: (312) 578-1750
Fax: (312) 578-1751

WEB: WWW.UCSUSA.ORG

Orphaned South Dakota Gas Wells Could Soon Power Bitcoin Mining

by **Seth Tupper** • Published on February 24, 2021

One of the orphaned Spyglass natural-gas wells.

SD DENR

POLITICS AND PUBLIC POLICY

Just when it looked like 40 orphaned natural-gas wells in northwestern South Dakota would finally be plugged, the story took a turn into the realm of cryptocurrency.

A Texas company, Spyglass Cedar Creek, drilled the wells 15 years ago on the vast grasslands in the vicinity of Buffalo.

South Dakota was stuck holding the bag after the project failed, because the state had only required the company to post about $30,000 in bonds. Last fall, the state hired a contractor to plug the wells for about $430 000. The contractor finished seven of the wells before pausing for the winter.

Then, multiple companies expressed interest in the remaining wells. So the state put the mineral rights associated with seven of the un-plugged wells up for a lease auction last month. A Wyoming company, Highwire Energy Partners, won the leases for $58,640.

Ryan Brunner, the state commissioner of school and public lands, conducted the auction. He said Highwire Energy Partners is not a typical oil and gas operator.

“Their operation is to put together generators and burn the natural gas on-site to mine bitcoin and cryptocurrency,” Brunner said.

Actually, the natural-gas wells will power the computers that create bitcoin. Here’s how it works: Bitcoin is a digital currency secured by cryptography – a cryptocurrency. Bitcoins are digitally “mined” into existence. But this isn’t “dig in the dirt” mining. Computers create new bitcoins when they solve complex numerical problems.

Will Reese, of Casper, Wyoming, is one of the partners in Highwire Energy.

“I've called it the minting process,” Reese said. “This is how new bitcoins are created and sent into the market every day. It's actually every 10 minutes a block is mined somewhere in the world.”

It takes lots of computers running 24/7 to make a successful bitcoin mining operation. And all those computers use a lot of electricity.

So bitcoin miners look for low-cost power. Reese said South Dakota’s orphaned gas wells are a good source. He hopes to have the site up and running in six months.

The company will use the natural-gas wells to fire a generator. The generator will power computers. The computers are housed in small fiberglass structures placed over the wells.

“You step into the door and to your right you'll see 70 to 90 computers that more or less look like big desktop computers,” Reese said. “We have them racked against the wall.”

The company already has similar operations in Wyoming.

“What we do with the bitcoin is what you would do with Apple stock, or anything else,” Reese said. “It goes onto our brokerage account. Our portfolio reflects a certain value, and we can – for our investors or for our operational costs – liquidate that into cash on a moment's notice. It's just like getting onto your E-Trade account.”

Highwire Energy Partners must post a $100,000 bond with the state (the Legislature raised bonding

minimums last year in reaction to the Spyglass situation). The company also must pay a $2,000 annual rental fee until it gets the wells in production, at which point the fees go away but monthly royalties are due to the state. The royalties are 12.5 percent of the value of the natural gas, as determined by the spot price of natural gas in a nearby pipeline.

Although Highwire Energy only has leases on state-owned minerals so far, Reese said the company may have interest in the rest of the wells, including some with privately owned mineral rights.

The value of a single bitcoin recently spiked above $50,000 for the first time ever. But not everyone is sold on it. U.S. Treasury Secretary Janet Yellen recently said she fears bitcoin is used for illicit finance, and she called bitcoin's energy consumption "staggering." One study estimates the global bitcoin network uses as much electricity as the country of Belgium.

Will Reese said Highwire Energy Partners may be the first company using natural gas to mine for bitcoin in South Dakota. Meanwhile, several digital-currency banks are now registered here, because of the state's favorable laws for banks and trusts.

One of those companies, called Anchorage, has an office in Sioux Falls. Last month, Anchorage became the first nationally chartered digital-asset bank.

Aug 13, 2020, 08:23am EDT | 19,804 views

Bitcoin Mining Can Be Profitable, If You Generate The Power

Robert Anzalone Contributor
Crypto & Blockchain
I report on the adoption of cryptocurrency, stablecoin and blockchain.

Bitcoin mining at 20MW, the Team at Greenidge located in the Finger Lake Region of New York State, ... [+] GREENIDGE

The New York Finger Lake Region is known for its wine and glacial

Greenidge Generation is a former coal-fired electrical power plant that has converted to natural gas. They supply electrical power to New York State's residents. Every day Greenidge has to bid in a competitive power market – sometimes, they make a profit when energy demand is higher. The company has been in business since 1937 but, in the last decade, suffered against cheaper power sources. The facility was mothballed in March 2011. Competition from cheaper shale natural gas supplies and coal exports from China put the old company into economic distress. Atlas Holdings bought the plant in 2014 and converted it to natural gas in 2017.

BROOKLYN, NEW YORK - JULY 4: Six meters placed by National Grid measure natural gas consumption in a ... [+] GETTY IMAGES

Atlas, which buys and transforms distressed industrial companies, helped turn the company into a more efficient energy model. But profits were always tight. It was in 2018 that CEO Dale Irwin and CFO Tim Rainey had the idea to use excess capacity to mine Bitcoin. This was a unique idea in the United States. Rainey says, "Cryptocurrency mining was an idea that evolved following discussions with our Board and leadership team, as we explored the best way to utilize the unique assets we have at the facility. Our Board approved a plan to pursue Bitcoin mining."

Dale Irwin said, "We started with a couple of S9's and some GPU rigs in early 2018 to familiarize ourselves with the economics of the machines and learn how to operate and run them. We turned that into a small test pilot of several hundred machines from many different manufacturers in May of 2019. After completion and

analysis of the test pilot, we built the current data center within four months, starting our larger-scale mining operation in January 2020." They currently operate 8,500 of the latest generation miners from Bitmain and other manufacturers.

Greenidge is using over 20 megawatts (MW) of power to mine Bitcoin, which makes it the largest energy company in the U.S. with this kind of strategy. In comparison, 20MW is not very big, next to other countries. There are larger Bitcoin mining facilities. The University of Cambridge's Bitcoin Electricity Consumption Index shows that global power use is estimated to be 7.25 gigawatts (GW), where China uses a bit over 71% of the global total.

MORE FOR YOU

Why The Actual Cost Of Mining Bitcoin Can Leave It Vulnerable To A Deep Correction

How To Earn Bitcoin With Your Gaming PC In 2021

New Bitcoin Mining Machines Hit US As Major Firm Inks Deal With Bitmain

Riot Blockchain, by comparison, said in their July 16th 2020 press release that their aggregate power consumption would be 12.8 megawatts.

The company purchases natural gas through forward contracts setting a threshold price. Electric power production costs will fluctuate and influence the decision to mine crypto or sell power to the gird.

Greenidge wants to increase its energy consumption. The company has plans to use the plant's total capacity of 104MW next year.

Mining Bitcoin and cryptocurrency is an energy-intensive enterprise. Some argue that it is a waste of energy and that digital assets are purely an environmental drain. One megawatt, by some estimates, could power about 800 homes on average per year. But this is a difficult statistic to estimate; electric consumption changes by region and need.

The company calls itself a power plant-mine hybrid, where it can generate more value being able to provide power to New York's grid or mine cryptocurrency. The choice to one or the other depends on what is more profitable on the day. Irwin continued to say, "Without crypto mining, it was economically unfeasible for us to provide capacity and energy to the state grid year-round and to continue providing employment opportunities to the local community, which provides the bulk of our workforce."

Rainey said, "As both the cryptocurrency markets and the power markets are constantly fluctuating, we do whichever is more profitable at any given time - either sell the generated power or mine crypto with that power. Although there is no fixed threshold of revenue from selling power that would make us want to sell the power instead of mine crypto, currently that number would be over $100 per MWh of power that we generate."

This model is unique as mining Bitcoin is not a trend in the power industry. If there are other power companies in similar situations, could this be a sustainable way to add income?

Tim Rainey said, "Without the mining operation, we would not be running most of the time, but if we ran around the clock, year-round, we would generate revenues of about $20/MWh. Bitcoin mining revenue with the latest generation hardware ranges anywhere from

$70/MWh to north of $200/MWh depending on price, global hashrate and difficulty."

Time will tell, but Rainey did add, "We've been able to capture over $500k additional revenue during hours when we would not otherwise have been dispatched to be online. Additionally, we are unique in that the same highly-skilled engineers, electricians, and other technicians that are on-site running the power plant 24/7 also help operate and maintain the mining hardware."

Follow me on Twitter or LinkedIn. Check out some of my other work here.

Robert Anzalone

As a journalist, I report on cryptocurrency, collateralized tokens and stablecoins. I've also written about blockchain projects with the potential to transform... **Read More**