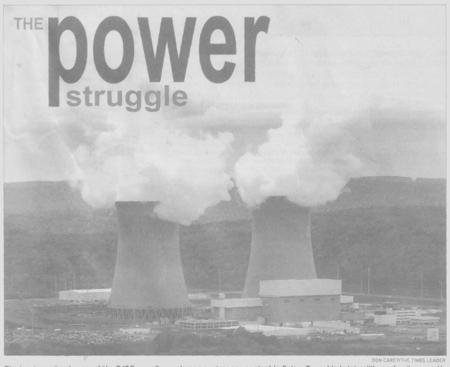
THE TIMES LEADER

WILKES-BARRE, PA | timesleader.com | SUNDAY, NOVEMBER 4, 2007



DON CAREY/THE TIMES LEADER

The iconic cooling towers of the 2,100-acre Susquehanna nuclear power plant in Salem Township belch millions of gallons worth of water vapor. Pumping out an almost continuous supply of cheap electricity and radioactive waste, the plant is both an integral part of the generation industry and a target of environmental and health advocates.

Stories by RORY SWEENEY | rsweeney@timesleader.com

Some say offering different electricity rates based on market demand could be way for customers to cut costs

Editor's note: First of a two-part series that explores changing electricity needs in Northeastern Pennsylvania and elsewhere.

Working within a tight budget, Ellen Cecelon sweats the small things. She buys secondhand clothing and discounted produce to clothe and feed her grandchildren. To make the numbers work, she's even risked her health.

"I took myself off all my medicine because I couldn't pay for it," the Plains Township resident said.

AIMEE DILGER/THE TIMES LEADER

Laundry is a constant, and costly, chore at Ellen Cecelon's Plains Township home. If she is able to reschedule similar energy-demanding tasks, she might save money using proposed market-based electricity rates.

Her most recent monthly electric bill was about $100, even though she's tried conservation measures such as buying energy-efficient light bulbs.

"I've tried a lot of different things. With everything going up, my money's not going far," she said.

One thing she hasn't tried is decreasing electricity use in her Main Street home during high-demand periods, and for one simple reason: It won't save her money – yet.

The idea of paying different rates for electricity – depending on market demand – could become an option for folks such as Cecelon if state lawmakers enact a new law now being discussed.

It will require electric utilities to offer special rate programs that could save money. Instead of the usual flat electricity rates, prices would rise and fall based on demand. Utilities will charge less for electricity during low-demand periods overnight and higher rates during the day when demand typically increases.

Quite simply, customers could save money by rescheduling electricity-intensive activities.

Used elsewhere

Electric utilities are promoting this change to let customers control costs, particularly in the face of expiring rate caps that will cause monthly bills to skyrocket by as much as 30 percent in 2010. Similar programs have been around in Europe, including France, England and Wales, for decades. In recent years, they've been in-

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As demand grows, it's either conserve or build new plants

SALEM TWP. – It's a clear, sultry, August day at the Susquehanna Steam Electric Station, just the kind of day energy utilities love – and hate.

Love because such days mean more air conditioning, which means selling more electricity. But hate because they won't reap the full profit margin.

Coming Monday: Why residential electric rates in Pennsylvania will spike in 2010 and what's being done to soften the blow.

"A kilowatt of electricity on a day like today is going to cost a lot more than a kilowatt of electricity at 3 o'clock in the morning on a day in May," PPL spokesman George Lewis explained. "Electric companies are paying their highest prices to generate electricity."

The reason why is a mix of issues that, in the face of ever-rising energy demand, leaves the industry that powers nearly everything we do at a vital crossroads: either find a way to curb our voracious energy appetite or greatly expand the energy trough.

Since 2004, peak demand in the mid-Atlantic region has risen almost 17 percent.

The growth has easily outpaced supply increases, allow-

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AIMEE DILGER/THE TIMES LEADER

Ellen Cecelon's daily routine includes several energy-demanding chores, such as vacuuming. Under proposed market-based electricity pricing, if she's able to change that routine from daily to nightly, she could save money.

POWER

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troduced successfully in Georgia, California and Arizona.

Legislators favor the idea to stave off the price spikes after caps expire and to avoid the need to build more transmission lines and power plants.

Gov. Edward Rendell is backing the proposal. He called a special legislative session on energy, which began in September, and campaigned heavily for time-of-use and the "smart" meters to make it work.

The Senate bill that would require such programs, if approved, would require time-of-use offerings within six years and allow utilities to charge customers for the cost of installing the new meters.

In other states where the bill option has been offered, monthly charges for the meters average about $3. However, the meters are able to monitor specific details about time, energy use and cost. They can also be programmed to notify customers or turn off certain appliances if prices become too high.

"The consumer is going to know immediately, instantly, exactly what's taking place and how many kilowatts they're burning at the time and find ways that they can save energy," said state Sen. Raphael Musto, D-Pittston Township.

Pilot program under way

PPL Electric Utilities, the electricity distribution arm of Allentown-based PPL Corp., has been running a pilot program during summer months since 2002 involving about 600 households. It offers off-peak power at a flat, below-standard rate and peak power at a rate above standard.

PPL's current rates are, on average, about 5.2 cents per kilowatt-hour. The pilot offers off-peak electricity at 3.6 cents per kilowatt-hour and 9.1 cents during midday peaks.

The program found that some people saved, on average, at least $10 per summer. But it also found that at least 25 percent of participants – and about 41 percent in 2004 – paid more with the experimental rates. One participant paid an extra $98.98 in 2004.

Though PPL concedes the pilot has only created modest savings, the company is confident it can work. "Making it an option is what's most important. It may not make sense for customers who may not be able to shift usage or conserve during peak periods," PPL spokesman Ryan Hill noted. "It can really make sense for families who both mom and dad work and the kids are at school, and you can really cut back during those on peak hours."

TOP 10 MOST ENERGY-DEMANDING APPLIANCES

Appliance	Estimated monthly use (kWh)	Estimated monthly cost ($)
Sauna or hot tub outdoor	500	35
Pool pump	463	32.41
Water heater (one adult)	400 + 162/addt'l person	28 + 11.34/addt'l person
Air Conditioner (8000 BTUH room unit)	300	21
Dehumidifier	290	20.30
22-24 cu. ft. frostless fridge/freezer	275	19.25
Sauna or hot tub (Conditioned area)	250	17.50
15-19 cu. ft. frostless fridge/freezer	230	16.10
Oxygen tank (concentrator)	227	15.89
Lighting	150	10.50

To benefit from time-of-use pricing, customers will have to reschedule use of certain appliances during low-price, off-peak periods. The appliances listed above cost the most to operate, meaning adjusting their use will provide the largest savings.

Live greener

And, while there is potential to save money, customers tend to see other social benefits.

"They have indicated to us in the past that there are other reasons ... most often green, sometimes just because it's the right thing to do," Hill said.

That's what keeps Darrell Brubaker and his family involved.

"We like the program; we'd like to see it expand . We'd go so far as saying we'd like to see it mandated," Brubaker said. "In America, it is always about the money and as long as you keep that in mind, everybody cares about how much they are going to save."

Brubaker, who works in Wilkes-Barre part of the week, has been able to save about 10 percent on the $200 monthly bill at his Elizabethtown home. He said it has caused his family to make minor changes to their lifestyle.

"It's one of those things where you play the multiplication game" as the monthly savings add up, he said. "Now you're starting to look at some substantial figures. And you're trying to offset some figures when the PPL rate caps come off."

In dollars, however, Brubaker's 10 percent savings is based on an atypical situation: his 3,400-square-foot house is larger than most Pennsylvania homes and offers extra amenities, circumstances that offer more opportunities to save.

"The program is the added incentive that gets you over the hump," Brubaker said. "You can always lay down the law to the rest of the household ... but if you lay down the law and say, 'This is why' ... you just hope some of that sinks in. ... We're looking for even better savings next year because we replaced the 11-year-old washer and dryer with front loaders" that save energy and water.

PPL is confident the program can work.

The true test, however, will be to sell it to customers.

But consumers such as Cecelon, of Plains Township, will need incentives to volunteer for the programs, and nothing entices like money – or saving it.

"If you could prove it to me, then I would probably do it," she said. "They would just have to sit me down and explain things, and I think I could give it a try."

Rory Sweeney, a Times Leader staff writer, may be reached at 970-7418.

DEMAND

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ing the peak demand to come within 13 percent of the region's total generating capacity.

Generation companies have seen the profit potential such increases portend.

"In the past several years, we saw a decrease in proposals and plants coming online, but in the last year, we're seeing a pick up in proposals for future generation," said Ray Dotter, spokesman for PJM Interconnection, the world's largest electricity wholesaler. The company serves 13 East Coast states, including Pennsylvania.

While many of the proposals are for small natural gas plants, the trend points toward larger, more efficient units. Government and industry officials are heralding a national "nuclear renaissance," evidenced by the announcement last month that federal regulators received an application for a new reactor – the first in the nation in three decades.

PPL, the Allentown-based power company, recently announced it was considering adding a third reactor to its 2,260-megawatt nuclear facility at Susquehanna.

To illustrate the capacity ramp-up: in September, PPL decommissioned two Northampton County coal power plants. The 150-megawatt units were the largest in PPL's fleet when they were built in the 1950s, but by the time they were shut down, they had become the company's smallest coal-fired generators.

Transmission concerns

But going bigger doesn't always mean getting better.

"If you don't have the power plants right where they're needed, you need to move" the electricity, PJM spokeswoman Paula DuPont-Kidder said. It must be sent across high-voltage transmission lines, which residents view as eyesores.

In June, the same month PPL announced it is considering the third reactor, PJM recommended PPL build a 500,000-volt transmission line by 2012 to connect this plant to a substation near Newark, N.J., about 115 miles away. Environmental groups and local officials and residents caught in the path immediately cried foul, complaining the line would cross the scenic Delaware Water Gap National Recreation Area.

"We're already seeing, and it's just my observation, that the opposition to a long-range, high-voltage line is as large as the opposition to anything I've seen ... because it affects so many people over such a wide area," state Consumer Advocate Sonny Popowsky said.

The U.S. Department of Energy fanned the flames last month when it created two National Interest Electric Transmission Corridors, one of which covers all but 15 of Pennsylvania's 67 counties, including Luzerne. The corridors would allow federal regulators to overrule states on transmission-line locations and permit builders to use eminent domain to acquire property.

The decision sparked near-universal ire from politicians. U.S. Sens. Arlen Specter, R-Philadelphia, and Bob Casey Jr., D-Scranton, Gov. Edward Rendell, the state Public Utilities Commission and state legislators expressed their disapproval to federal Secretary of Energy Samuel W. Bodman and threatened to thwart the ruling. Casey even attempted to block it.

Curbing demand

Long-standing opposition to the lines, whose detractors often say ruin picturesque vistas as they snake across rural areas, has government officials considering ways to curb demand.

Termed "demand-side response," the ideas center on getting consumers to cut back on use during high-demand periods.

To understand the logic, it's important to point out a few things:

• Energy demand changes, almost literally, at the speed of light; the infrastructure to supply that electricity does not. Even if the average demand doesn't increase, increases in peak demand mean more plants are necessary.

• Demand changes enough throughout the day that if some usage were simply rescheduled to another time, it could even out the ebbs and flows, reducing the need for increased production.

• Electric utilities don't produce the energy they distribute to customers. They buy it on the open market from electric-generation companies. That means the purchase price is based on how much demand exists.

• Utilities often charge customers flat rates, some of which, like in Pennsylvania, are capped by legislation.

To combat this, some utilities are offering so-called "time-of-use" programs. By enticing customers to change the times they use energy, utilities and customers can save money, generating companies can rely on a predictable demand and more transmission lines won't be necessary.

Duel approach needed

Which approach will win out? Perhaps neither.

"I hate to say it, but I think you have to do both ... which is not to say that I think we need to build all these big transmission lines," Popowsky, the consumer advocate, said.

He supports increasing supply where demand increases. "You always hear that, 'oh, you can't build anything on the East Coast,' " he said. "It's true that you can't build anywhere, but you could probably build something in most places. ... There are sites like the Susquehanna site ... that theoretically have more room for more units."

Like Popowsky, U.S. Rep. Paul E. Kanjorski supports the usage-curbing programs. He wistfully remembers a time when "if you left the room and left the light on, you really heard it from your parents."

Today, however, "we're a wasteful nation. We've raised a nation of children who leave lights on. ... They almost seem to consider that power is free," he said.

Regulations and programs are fine, he said, but the real work needs to be done by average people, Kanjorski said.

"So why don't we treat it like a war effort? Hell, we're in a war over oil," the congressman said. Children should be educated about energy saving at school. "After five, six years of grade school, these kids for the rest of their lives will be conservative."

That being said, Kanjorski also dreams of building transmission lines "like building the interstate highways." Not doing so will risk blackouts, so "as we push closer to that doomsday that we're running out capacity, people will say, 'Let's get it done.' "

There are various ways to go about it, he said, such as combining them along with existing lines or in other long-distance infrastructure, like highways.

And while observing property rights is important, he said, caring about how lines affect the view through someone's back window isn't. "If an ugly woman lives next to me, I may be offended," Kanjorski said. "But I'm not entitled to compensation."

So the future-energy debate comes down to this: Invest in more places like this 2,100-acre facility near Berwick, where millions of gallons of water vapor constantly rise from iconic cooling towers and, somewhere hidden deep within the plant, neutrons smash into 270 tons of uranium atoms to release energy.

Or invest in small, energy-saving practices, like doing laundry at night and installing compact fluorescent light bulbs.

Luckily, the immediate answer seems to be simple alternative. "If I had a dollar to spend," Popowsky said, "the first thing I'd do is change my light bulb."

Rory Sweeney, a Times Leader staff writer, may be reached at 970-7418.

THE TIMES LEADER

WILKES-BARRE, PA | timesleader.com | MONDAY, NOVEMBER 5, 2007

Power transmission complex, costly

Getting the electricity where it is in the highest demand a matter of type of plants, lines available.

Second of a two-part series.
By RORY SWEENEY
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HAWLEY – Perhaps the crowd for the open house at PPL Corp.'s Lake Wallenpaupack hydroelectric dam was an indication. There were old and young people alike, but few in between, suggesting most folks had found other things to do at this lakeside town on an overcast summer day.

That illustrates the public's attitude on electricity production. Consumers want it here on demand as cheaply as possible, but only those inquisitive few care about where it comes from or how it is transmitted.

MORE INFO

To read Part I of "The power struggle" series, see Sunday's Times Leader or go to www.timesleader.com.

Consumers, attuned or indifferent, will get bigger electric bills in 2010 when prices in Pennsylvania jump perhaps 35 percent or more. Electricity companies say it's an inevitable reaction to open-market prices that increased during the cap years.

Alert customers might be confused. Wait, they might ask, haven't bills already gone up? Haven't companies already received rate increases?

Indeed, they have because only the generation rate, which accounts for about 40 percent of the total cost, was capped. Utilities have been free to request and receive increases to transmission and distribution rates. This year alone, local provider PPL Electric Utilities has requested increases of about 10 percent. About half of that has already been granted by the state Public Utilities Commission.

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DON CAREY/THE TIMES LEADER

Wind turbines at the Bear Creek wind park rise about 400 feet in the air, towering above the tree line. Wind energy is the fastest growing energy source in the state.

Region focus of energy production

Wind power, bio-fuel, hydroelectric power and geothermal energy are being tried locally.

By RORY SWEENEY
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BEAR CREEK TWP. – It's been decades since Northeastern Pennsylvania laid claim to being the world's energy king.

But with many new ideas and renewable production sites fueling a resurgence of local significance in the energy game, perhaps the region is destined to regain part of its past glory.

The most noticeable argument for such a claim is wind energy, led by the tall, white turbines perpetually spinning on Bald Mountain.

Up there on a cool fall day, the 12 turbines, rising above the tree line and silhouetted by the clear blue sky, seem like high-tech trail markers stretching over 3.5 miles. Beyond the continuous mechanical hum and the cyclical whoosh from the passing blades, nature commands the ambiance.

"It's a pretty quiet place, actually," said Todd Solliday, the park's manager.

Though wind parks draw criticism, they are the fastest-growing energy source in the state, according to Doug Biden of the Electric Power Generation Association. Projects are in the works for another mountain in the township, several ridges in and around Noxen Township and elsewhere in Northeastern Pennsylvania.

The region also is being eyed for biofuel production. One investor consortium is looking to build a plant in May-

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ENERGY

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Demand surges

Demand changes constantly, creating spikes that the industry must handle or risk blackouts.

It's not cost effective for generating companies to always generate peak-period amounts, so the industry has created a two-tiered system to handle that demand.

The first tier is large, efficient power plants that create vast amounts of power. The plants are slow to turn on, but run almost continually, forming the backbone of the supply.

The second tier includes small, often automated "peaking" plants that usually run on expensive fuel, but can be turned on almost instantly. They run when demand exceeds the large plants' output.

"The philosophy is entirely different," PPL spokesman George Lewis said. "Those plants are for the most part sitting in wait. If they get the call ... they'd better be able to start."

Electricity is sold by generating companies in an open market through a brokerage organization to utility companies. The brokerage solicits bids from the generating companies, and accepts the lowest ones first.

Generating companies, however, are all paid the highest accepted bid. So when expensive peaking units must be used, utilities pay a premium price for every megawatt.

The rate caps, which began in 1996, have kept customers from feeling that effect.

Also at issue is where plants are located. Because large plants often face opposition, they often are built where few people live.

Pa. largest exporter

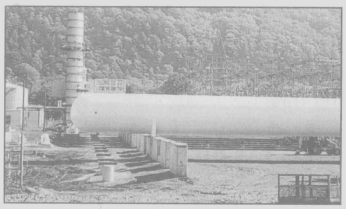
Pennsylvania exported 70 billion kilowatt-hours in 2006, more than any other state, according to Doug Biden of the Electric Power Generation Association.

All that power gets shipped through high-voltage lines, which themselves often receive opposition.

"I would say it's more difficult to build a transmission line than to build anything else just because of its length," state Consumer Advocate Sonny Popowsky said.

They're also somewhat unreliable. In August 2003, electricity-laden lines in Ohio sagged into a tree, sparking a blackout that crippled the Northeast. And PPL estimates energy lost to heat while traveling on the lines accounts for 9 percent of use.

To control the price shocks that come with relying on one fuel, the industry plans to use a variety of fuels in the future. Politicians are pushing eco-friendly sources.



AIMEE DILGER/THE TIMES LEADER

Though it looks like part of the hulking coal plant next to it, these tanks visible along U.S. Route 11 in Hunlock Creek are part of an automated natural gas 'peaking' plant owned by UGI. On days when demand peaks, the plant can create electricity very quickly.

Lines needed

But such plants must go where the fuel is, requiring more transmission lines. Furthermore, their energy-production-to-land-use efficiency is dwarfed by larger, more established plants.

An example: The Susquehanna nuclear plant near Berwick can produce about six times more power per acre than the Bear Creek wind park.

Renewable energy accounts for only 3 percent of total generation in the state, according to Biden.

Legislation might soon make renewable sources more appealing, though. Renewable energy quotas have been passed in some states, including Pennsylvania. More stringent carbon dioxide emissions caps would put heavy economic restrictions on coal plants.

Many officials believe it comes down to personal responsibility.

"We have a society problem where we demand electricity" while complaining about its drawbacks, said Terry Williamson, a spokesman for the brokerage organization PJM Interconnection. "But you've gotta have the juice somewhere."

Rory Sweeney, a Times Leader staff writer, may be reached at 970-7418.

Unlikely sources provide clean power

By RORY SWEENEY
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DERRY TWP. – It seems like it's been years since the Montour coal-fired power plant near Washingtonville has had a good cleaning itself, much less a major modification to clean up the environment.

But that's what a swarm of construction workers bustling around two massive cylinders have been doing at the Montour County plant in preparation for the unveiling of a new drywall plant in early 2008.

Sure, a drywall plant at a power plant sounds odd, but such cooperation between industries is increasing as the energy industry works to solve its own environmental problems by helping solve others.

The construction at the power plant is actually to create dual "scrubbers," which remove pollutants from the plant's exhaust by spraying limestone slurry over the flue gas. The limestone and water react with sulfur dioxide to form synthetic gypsum. Once operational, the scrubbers will reduce the plant's sulfur dioxide emissions 97 percent to 3,000 tons per year.

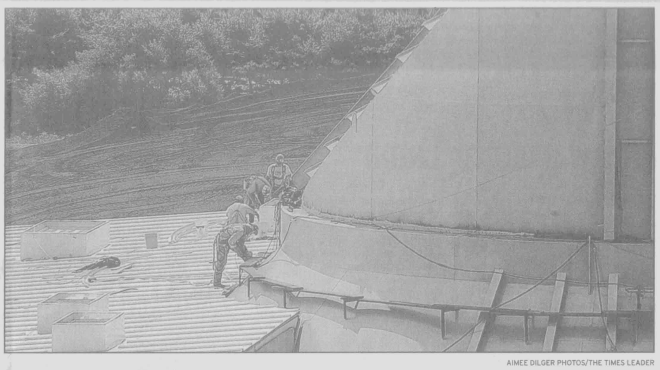
While coal plants are often seen as particularly dirty electricity sources, other modifications since it came online 1972 reduce several key air pollutants.

"It's not a zero-emission plant, but it's closer than it's ever been," said Dan Crispell, the plant's environment, safety and health manager.

The byproduct gypsum from the scrubbers will be shipped along a conveyor belt to a plant being built down the road, which will use it to produce about 150 miles of drywall boards each year.

Another byproduct from using coal that has gained attention, both positive and negative, in this region is fly ash. The debate over its use to fill mine voids has raised concerns in various places recently, including Hazleton, but a much more accepted use is as a substitute ingredient in concrete and, when mixed with other substances, a stable fill material.

The energy industry also uses the resources and byproducts of other industries for energy creation. Generation companies are searching in unlikely areas for fuel sources, such as gas from landfills, solar energy collected from the rooftops of large stores and cogeneration, a process that harnesses the waste heat created during electricity production.



AIMEE DILGER PHOTOS/THE TIMES LEADER

Skilled workers connect an absorber to an exhaust stack at PPL's Montour coal plant. The absorber is part of major renovations to decrease pollution emissions. 'We've got 1,000 people here, and 800 of them are doing very risky work,' said Dan Crispell, the plant's environment, safety and health manager.

George W. Auten, the control operator at PPL's Montour coal plant, watches over gauges that measure every detail of producing electricity from burning coal.

Pennsylvania has several power plants that burn methane from landfills. Decomposing trash constantly produces a mixture of gas that landfills used to simply vent off as pollution. One such plant went online in Lebanon County about a month ago. A similar project at two Lancaster County landfills was named a 2006 "Project of the Year" by the U.S. Environmental Protection Agency's Landfill Methane Outreach Program.

That project buys the gas from the landfills to power a 3.2-megawatt generator, supplying power for several thousand homes, and pipes waste heat to Turkey Hill Dairy for pasteurization and other operations, offsetting about 80 percent of the diesel fuel the well-known diary previously used.

However, problems do exist. Landfill gas isn't pure methane and contains low levels of toxic chemicals, notes the Energy Justice Network, an environmentally safe energy advocacy group. When burned, those chemicals can combine with hydrocarbons into even more toxic chemicals, which are then released into the environment, the group contends. Its impurity also means it doesn't burn as cleanly as natural gas, which is mostly methane.

WIND

Continued from Page 1A

field, Lackawanna County, that would pump out about 60 million gallons of corn-based ethanol annually.

A smaller company wants to set up shop on a culm bank in Newport Township, where its principals will try to do what the industry says can't be done yet – create price-competitive fuel from grass.

Using algae – the killer of some lakes in Northeastern Pennsylvania – a company recently won a $1 million state grant to research creating biodiesel from algae blooms in Jenkins Township.

Hydroelectric power is also rising. Lake Wallenpaupack already boasts a 44-megawatt system. Last month, the state announced a $750,000 grant to add two turbines to the Beltzville Dam in Carbon County.

For residents, a small shed in the middle of an empty lot off Providence Street in Scranton might prove the biggest renewable energy impact. There, amateur researchers are demonstrating a cheap, renewable way to extract energy from the mine water left by the coal industry.

The idea would harness the thermal energy in minepool water to heat and cool thousands of homes located atop the major mine seams that run from Shickshinny to Forest City. According to the system's engineers, it would pay for itself in four years, and the energy source would exist indefinitely, regardless of how many places tapped into it.

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