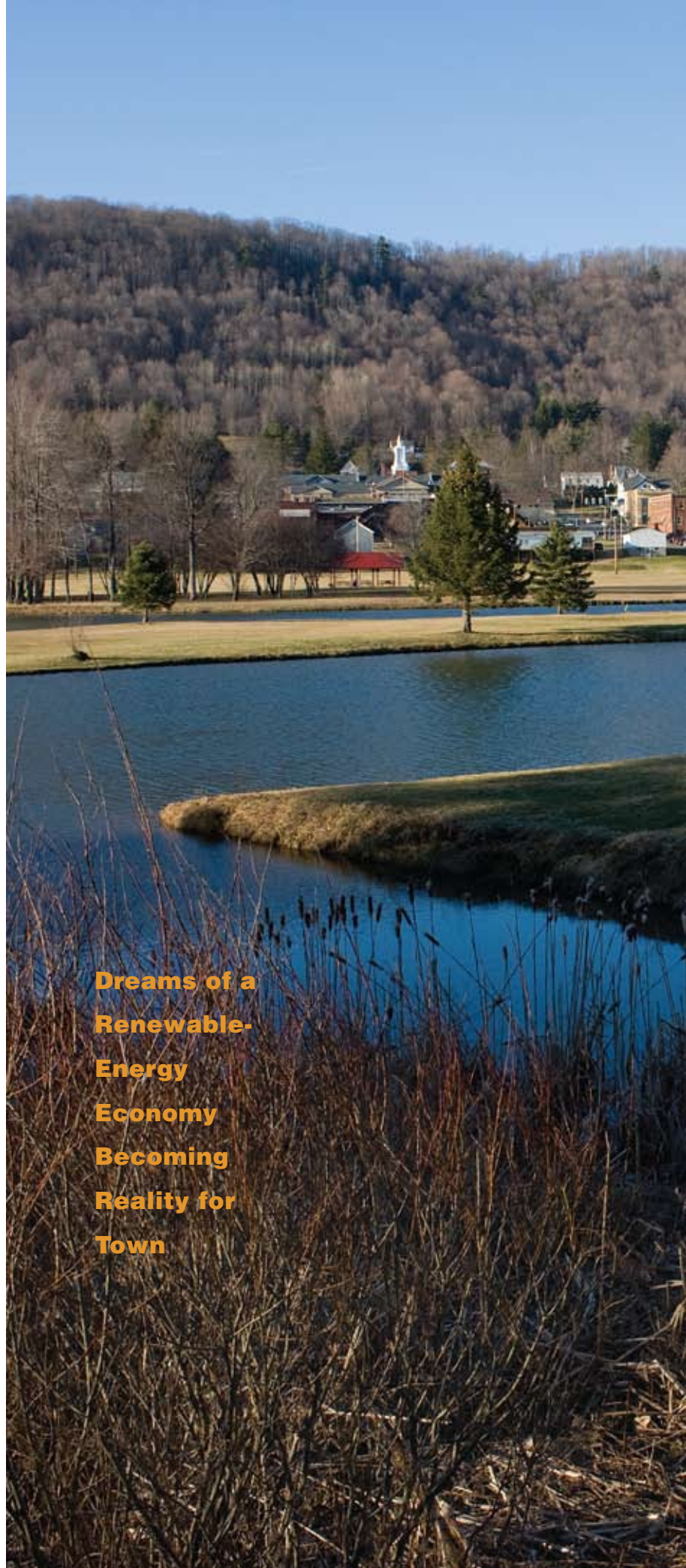
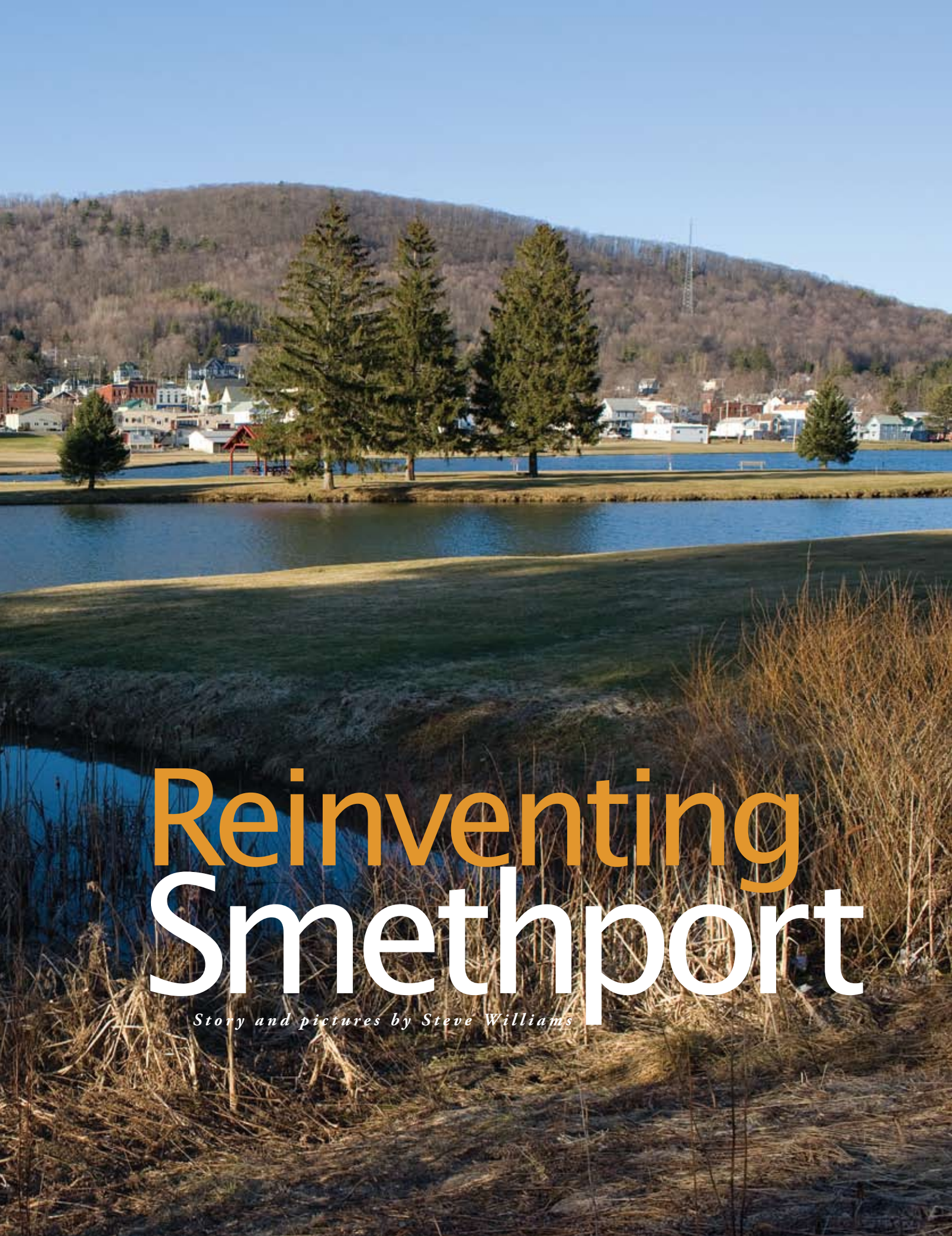


**ARRIVING IN SMETHPORT FROM ANY**  
direction, you can't help but be aware of the trees. You wind along a narrow, two-lane highway where the mountains creep right up to the road. The pavement runs miles through tunnels of trees until finally opening onto a small valley. You're in McKean County, the state's most heavily forested county, where the Borough of Smethport, population 1,684, lies within 5.2 million acres of federal, state, and privately owned forest. It's a small town with a history of creativity—a toy industry developed more than 100 years ago is still going strong with toys like Woolly Willy available at Amazon.com. But that's not all that's unique about Smethport.



**Dreams of a  
Renewable-  
Energy  
Economy  
Becoming  
Reality for  
Town**



# Reinventing Smethport

*Story and pictures by Steve Williams*

Since the 1920s, the borough has owned and operated its own electric company. To this day, it remains unique in the twelve-county “Pennsylvania Wilds” region as the only municipality that runs its own power company—servicing its own transmission lines and purchasing electricity from outside generators.

But the town has a problem. The borough’s 100-year-old water system is in desperate need of replacement. Old iron pipes, and even some wood piping, run underground throughout the community. The price tag to rebuild the system—currently estimated at \$20 million—is daunting. For a community of fewer than 1,700 people that’s just shy of \$12,000 per person.

“Because of careful management, our budget is stable, with no deficits,” Smethport mayor Ross Porter explains. “But paying for new water lines entirely with revenue from our water rates will put us back fifty years. We need to be creative.”

Some innovative thinking may help the borough turn this infrastructure problem into a major opportunity. The rise in oil prices in recent years has stimulated a renewed focus on alternative energy, rekindling interest in a 1980 plan to utilize woody biomass from the surrounding forest. Back then, the McKean County Industrial Development Council did a feasibility study, looking at the construction of a fifty-megawatt power plant generating electricity through the burning of woody biomass harvested from the area. (The smallest nuclear plant is 600 megawatts.) A plant this size could power nearly 14,000 homes—far too big for Smethport’s needs. But the possibility of using local resources to produce energy was attractive then and is even more so today.

With help from Penn State faculty and extension educators, the Smethport dream may soon become a reality. “This idea was born in Penn State’s College of Agricultural Sciences,” says Porter. “Dean [Robert] Steele funded a study trip to Austria to explore community energy systems. That trip triggered everything that’s happening now.”

What emerged is a proposal to use wood chips from the local forest to fuel a combined heat and power (CHP) proj-



**Paul Roth (left), specialist with the Pennsylvania Department of Conservation and Natural Resources, and McKean County extension educator Tim Pierson survey one of the proposed sites for the Smethport combined heat and power facility just outside of town.**

ect that will generate both electricity and hot-water heat for residents and businesses. The hot water would be delivered through a new system of underground pipes, essentially killing two birds with one stone.

Along on the European study tour were McKean County extension educator Timothy Pierson, wood scientist Charles Ray, and Westmoreland County extension educator Edward Johnston-baugh. Pierson saw immediate possibili-

ties in Pennsylvania for a combined heat and power project like the ones spread throughout Europe. “The system we saw running in Güssing, Austria, was exactly what Smethport needed,” he says. “Similar location, similar situation, population. It would allow us to generate a modest amount of power and produce hot water for heat for the all of the businesses and residents.”

Güssing, Austria, also a small community surrounded by forestland, mirrors

Smethport in many respects. “Tim called from Austria saying, ‘This is awesome! This could work in Smethport!’” Porter recalls.

A CHP system features a centralized plant, which can produce electricity and hot water that is distributed locally to residences, businesses, and public buildings for their power and heating needs. Done correctly, these projects are efficient and provide a wide range of economic benefits. Similar systems are already in place in European communities and have a proven track record in supplying local heat and power needs. Implementing such projects is a step toward a future that embraces energy independence and more vital and sustainable local economies.

If the Borough of Smethport is already digging up and replacing pipes, it may make sense to run pipes that could provide hot water as well, providing a way to leverage the costs of rebuilding the water system. “If we can bring funding streams together—that is, rebuild the water system and install a distributed heating system—we’ll achieve a multitude of goals,” says Porter. “Subsequently, we’ll also pump up our local economy.”

The town wants to become the first in the nation to use a local renewable fuel source to become energy self-sufficient. Currently, more than \$1 million leaves the Smethport area every year to pay for electricity generated in other states, such as Ohio and New York. Even more money leaves to pay for oil and other fuels used to heat homes and businesses. A locally based CHP would make sure most of that money remained close to home, where it could re-energize the local economy.

“Many people believe the big benefit of a CHP project is electricity,” Pierson says. “But the real financial impact comes from the centrally distributed heat. By some estimates, a household’s heating bills could drop by as much as 50 percent.”

**The Smethport Woody Biomass Leadership Team discusses plans and progress related to the combined heat and power project. The group is co-chaired by McKean County extension educator Tim Pierson and Ross Porter, mayor of the borough of Smethport.**

He explains that about a third of the energy output from burning wood is converted to electricity. The remaining two-thirds of the energy is in the form of heat. If a community utilizes that heat, the fuel efficiency rises to over 80 percent, and that’s where money is saved. Using a distributed heating system that pipes hot water throughout the borough to homes, businesses, and schools leads to cost savings for everyone connected to the system.

“Wood chips are less volatile in terms of price,” says Paul Roth, a specialist with the Pennsylvania Department of Conservation and Natural Resources. “Historically, the wood chip market hasn’t seen the kinds of dramatic market shifts that occurred recently in oil and gas. From a BTU perspective, wood chips average one-fifth the cost of home heating oil for the same heat value. If we see fossil fuel prices escalate again, wood will be even more cost competitive.”

Operation of the plant would reach beyond Smethport to support forest industry jobs, which have been hard hit by the recent economic downturn. Early estimates point to an ongoing need for about 30 tons of fuel each week that would have to be cut, chipped, and shipped to the generation site. A CHP facility would create an ongoing, reliable

demand for wood chips, providing consistent employment to loggers and truckers as well as giving forestland owners and forest managers wider economic options when making decisions about what trees they should cut.

It’s not just the economy that benefits from a project like this, experts say. The forest does too. Current demand in the timber market results in loggers cutting the valuable trees from the forest. Without a market for the low-value or waste wood, forest composition is increasingly lopsided in the direction of low-value trees.

“Well-planned and executed harvesting operations that implement the recommendations found within DCNR’s Guidance on Harvesting Woody Biomass for Energy in Pennsylvania present an opportunity to enhance the composition, health, and productivity of our forests,” says Roth. “The Department of Conservation and Natural Resources is very supportive of the initiative in Smethport. Executed correctly, it’s a win-win situation for everyone.”

Johnstonbaugh also brings critical expertise to the project in regard to navigating the power-generating world. At a recent meeting in Smethport, he discussed legislation regarding the sale of Alternative Energy Credits. He explained how



the system works and noted its advantages and risks.

By Pennsylvania law, Johnstonbaugh says, power-generating companies must prove that a certain amount of their elec-

It's easy to sense the excitement for the project, but concerns are also aired. Images of devastation from logging operations in the early 1900s still echo in the region. And a CHP plant often is judged

Other technical challenges must be met as well. "There's always the danger of choosing too big a system," says Johnstonbaugh. "That could lower the total efficiency of the project."

The team, co-chaired by Porter and Pierson, includes local elected officials, planning personnel, a staff member from the office of a United States congressman, representatives from the local forest industry, staff from the Pennsylvania Bureau of Forestry, Penn State faculty and extension educators, and others. All are there to offer support and expertise that can help bring this project to life.

Asked why he decided to fund the fact-finding trip to Austria, Steele, then the college's dean, replies: "Venture capital." He explains that the college looks for opportunities to apply proven research results where it makes sense. When the reasons for the trip were outlined, Steele believed it was an idea worth pursuing. "The college has the ability to explore good ideas," he says, "just as venture capitalists do in hopes of supporting

exceptional opportunities. Penn State is committed to helping communities make the right decisions."

Playing this kind of role is somewhat of a departure for Penn State Cooperative



Ross Porter

tricity has been generated by alternative sources (like that from a woody-biomass facility), or that a certain amount of power has been conserved. Proof exists in the form of Alternative Energy Credits (AECs).

"Since these credits can be bought and sold as a commodity, power companies can meet legislative targets by buying credits from other entities, which could potentially support efforts like the one planned for Smethport," he says. "These credits are valuable: prices per kilowatt-hour for alternative energy are far higher than prices for conventionally produced power, making them a potential profit engine for the community."

The project's leadership team is working hard to make the right decisions to ensure long-term success. "These projects must be planned carefully," says Johnstonbaugh. "For instance, when a municipality enters this kind of project, the need for consistent, long-term management is critical. Elected officials move on. New officials will need to understand the system."

by the emissions belching from outdoor wood furnaces that can clog a valley with smoke, raising concerns about the impact on health and air quality.

"These new biomass combustion technologies are clean," says bioenergy scientist Ray. "When we were in Güssing, we weren't even sure when the plant was operating. You don't see anything coming out of the stack." The newest systems burn at around 93 percent efficiency and produce almost no smoke or odor.

Questions related to economic engineering also remain—making the right decisions up front is critical because the community will have to live with them a long time. What size of generating facility is needed? Should it be sized for growth over the next twenty-five years, and for a peak load or average load?

Power generators are not simple and require professional staff to run them. A plant needs qualified people 24 hours a day, 365 days a year. You don't find people with these skills easily, and the project would have to compete with commercial power plants for employees in many cases.



Edward Johnstonbaugh

Extension, which traditionally focuses on educational programs. “Extension is beginning to partner in these kinds of projects,” says Gregory Roth, state program leader for renewable and alternative energy. “Communities need to understand the balance between forest utilization and environmental concerns, as well as the pros and cons of technologies. We can help in several ways—as a catalyst to get projects funded and moving forward, for one. And we’re also helping the state and federal governments achieve goals they’ve set for renewable energy.”

Mayor Porter believes the college’s participation is critical to the project’s success. “Penn State brings the technical expertise to the table that we need to make this happen,” he says. “We hope to continue working with the college to establish a research, technology, and outreach (RTO) center here, similar to the one in Güssing. This will attract new kinds of research, business, and industry to the area.”

As for the college’s commitment, more research is underway to help build a solid scientific foundation for woody-biomass projects. Forest-management expert Marc McDill heads a group of scientists in the School of Forest Resources that has received funds from the Sun Grant Initiative to evaluate the economics and sustainability of woody-biomass harvesting in the region. This work will be valuable



to future expansion of CHP projects.

“In the past four years, Penn State has invested more than \$1.5 million of its own research funds on biomass energy production,” says Ray. “That seed money has brought in more than \$20 million of additional research funds. We’re developing the foundational science for environmental and economic utilization of woody biomass—because we’re sitting on a big source of it right here in Pennsylvania.”

The rapid pace of activity surrounding the Smethport CHP and RTO projects challenges everyone involved. The Woody Biomass Leadership Team now is seeking additional funds, gathering more information and data, and searching for an engineering consultant to conduct a feasibility study. But the team knows that financial resources are needed to make it happen.

“The project is moving ahead wonderfully,” says Porter. “We hope to tie into funds from the federal economic stimulus package now. We feel pretty good about getting all of the pieces of the puzzle together.”

Many small communities have tried various ways of strengthening their economies. They have enlisted the support of state and federal agencies, businesses, and industries, often with little success. But supporters say this Smethport project is different. This time, they say, all the right people are at the table, pulling in

the same direction. In twelve to eighteen months, construction could begin on the first community CHP in Pennsylvania.

At one level, this is a story about alternative power generation. At another, it is a case study in how a community can come together and gather the knowledge, resources, and support needed to create something with lasting value and impact. “This plan will save residents money, as well as energize the local economy,” Porter says. “To reinvent Smethport’s future, we have to be as smart as we can.”

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*Faculty and staff referenced in this article are Edward Johnstonbaugh, assistant extension educator in agri-energy economic development based in Westmoreland County; Marc McDill, associate professor of forest management; Timothy Pierson, senior extension educator in agriculture and natural resources based in McKean County; Charles Ray, associate professor of wood products operations; Gregory Roth, professor of agronomy and Penn State Cooperative Extension state program leader for renewable and alternative energy; and Robert Steele, professor of food science and former dean of the College of Agricultural Sciences.*

*More information on the Smethport project is available online at [smethportpa.org/borough/green-energy-biomass](http://smethportpa.org/borough/green-energy-biomass). To learn more about renewable energy programs in Güssing, Austria, see [www.ecreag.com](http://www.ecreag.com).*