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Energy, Environment, and Sustainable Industry in the Appalachian Mountains, United States

Steve Owen
Jeff Boyer

In July 1979, the world's largest wind turbine was dedicated on Howard's Knob, a mountain overlooking Boone, North Carolina. NASA and the Department of Energy's selection of this site confirmed the wind resource, and the windmill's striking presence above town sparked a great deal of imagination. But a newly elected President Reagan removed solar panels from the White House, and along with them went public investment in renewable energy. Nearly 3 decades later the converging threats of peak oil and global warming are compelling reasons to reconsider the wind in Appalachia. Howard's Knob is a poignant reminder of a comparative advantage that could spawn vital new industries and sustainable livelihoods. Appalachia's coal and timber helped to underwrite America's 20th century growth, but the process left a legacy of poverty and environmental destruction. Most recently, free trade agreements have sparked a wave of unemployment prompting citizens, business, and local government to look for a better way forward.



Limits to extractive economies

Economic inequities and ecosystem ruin provide a telling rationale for regional sustainability and demand the creation of green industry and restored livelihoods. More than 2 decades of corporate downsizing and global outsourcing has left mountain towns without steady jobs in light industry. Unemployment has run over 10% in some mountain counties, and the figure is probably higher as displaced workers revert to livelihood strategies outside the formal economy. Further, the predominance of low-wage service jobs is a thin veneer on a vulnerable job market. Statewide, unemployment peaked at almost 7% and ran above 6% for 27 consecutive months.

In central Appalachia (Figure 1), where "King Coal" has operated since the 1880s, the impacts of the "coal cycle" reach from the household to the larger geogra-

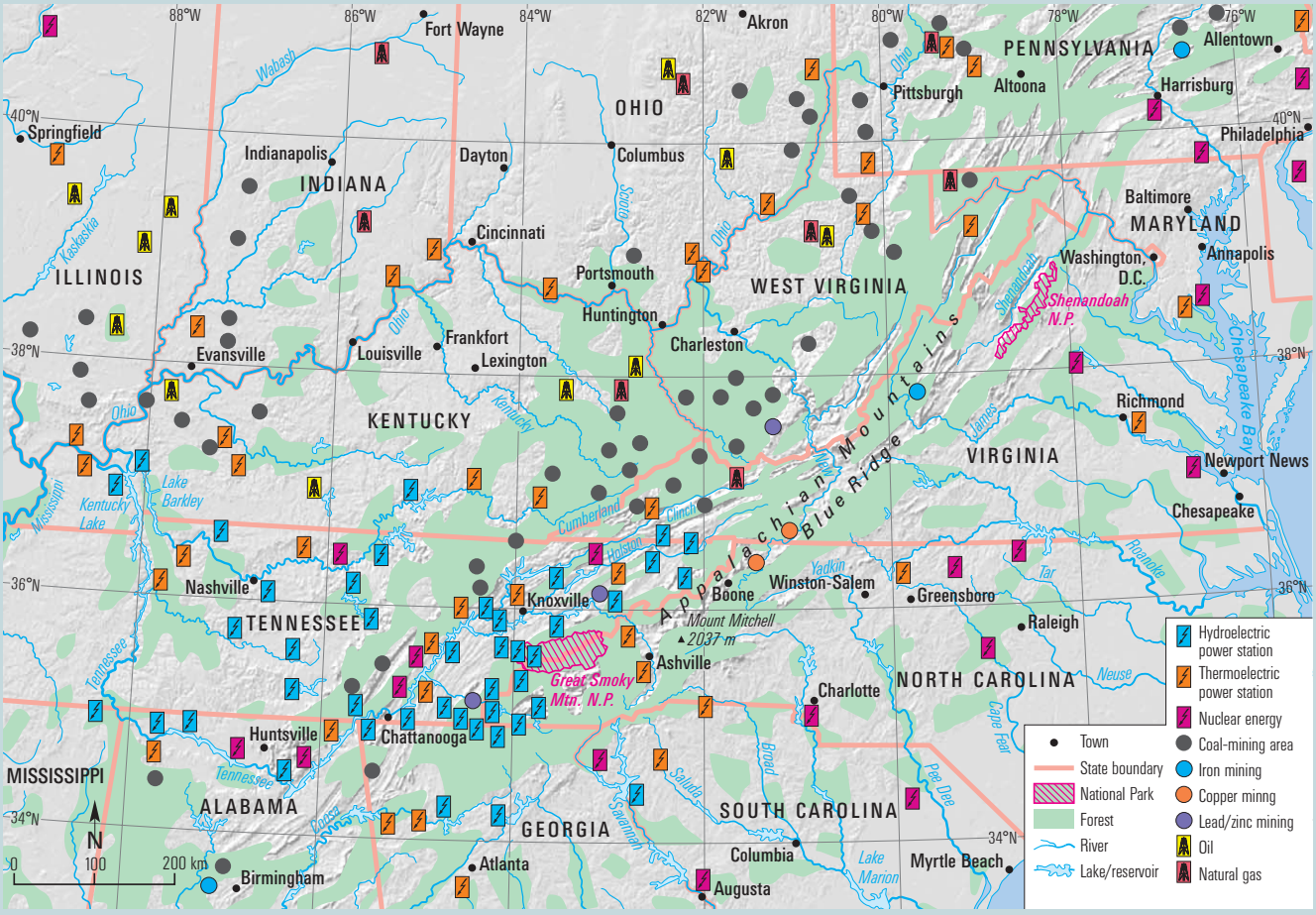


FIGURE 1 Main industrial features linked to the coal mining and power industry in the Appalachian Mountains. (Map by Andreas Brodbeck)

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phy of eastern America. In the Clearfork Valley, on the Tennessee–Kentucky border, coal trucks ferry their loads toward distant power plants to supply America's demand for electricity. Even in these very coal-producing communities, creative livelihood strategies are stymied by rising electricity bills from coal-fired power. Mountain top removal mining is rapidly destroying entire mountains and the ecosystems that supply eastern America's water. Once thought to be plentiful, water has entered the policy discourse in terms of scarcity, and has become a problem in daily life for coalfield residents. Another problem is air pollution from coal-fired power plants far from Appalachia, which contributes to the decline of high altitude spruce-fir zones and the region's respiratory health. Resource exploitation also takes the form of land commodification for tourism and real estate development, which is rapaciously carving a suburban landscape into fragile slopes, forests, and former family farms.

The emergence of sustainable development

Presently, wind and other renewable energy initiatives are attempting to scale up and expand their job creation potential. To emphasize the need to preserve existing jobs, our first case is a workers' fight to save an 89-year-old paper mill. In 1997 Champion International Paper put its Canton, North Carolina mill on the auction block, triggering a wave of fear throughout the region's economy, especially among the mill's 5000 workers. But with the help of Frank Adams and the Southern Appalachian Center for Cooperative Ownership, workers were able to navigate the complex business, legal, financial, and political hurdles to buy the company, which became Blue Ridge Paper.

While this mill's production has several green hurdles to overcome, this is an instructive case about the transitional nature of sustainability. As we have already stated, many jobs were saved. Moreover, Adams' consulting approach was rooted in education for social change. Consequently, the workers soon began to trust in their abilities as negotiators and managers, producing some counterintuitive, but highly successful strategies. In one notable example, the workers engaged environmentalists as a strategic partner in their acquisition bid. Champion's pollution of the Pigeon River sparked a legal battle with the governments of North Carolina and Tennessee, and with environmental groups. But this move won the environmentalists' endorsement of the workers' proposal, key to allaying investor fear of environmental liability. Blue Ridge Paper reciprocated by making significant investments to clean up the river, which cuts a deep gorge through the Great Smoky Mountains. This case embodies several key concepts of this new sustainability movement—empowerment, workplace democracy, livelihood retention, and a good faith effort to reduce waste and restore the river's ecosystem.

Numerous local governments, in partnership with complementary agencies, economic development authorities, and the private sector, are beginning to develop landfill methane projects (Figure 2). Solid waste landfills produce methane gas as a by-product of decomposition, which can be captured for productive uses. The stories of two of these illustrate the place-specific challenges and opportunities they afford. In Yancey County, North Carolina, beneath the Black Mountains—eastern America's highest—the Energy Xchange business incubator supports heritage crafts studios, green houses, and an education center. Arts and crafts in the moun-

FIGURE 2 Capped landfill with methane recovery operation in Yancey County, North Carolina. (Photo courtesy of Energy Xchange)



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FIGURE 3 Glass blowers producing crafts for market at the Energy Xchange. (Photo courtesy of Energy Xchange)

tain region have historic roots and are being embraced by several communities as an alternative economic development strategy (Figure 3). In the development of Energy Xchange, the planning and steady encouragement of a federal rural development official played an important part in its success.

In the Blue Ridge Mountain foothills, Catawba County, North Carolina has installed 3 megawatts of co-generation capacity to utilize its landfill methane. Revenues from the sale of electricity to Duke Power directly benefit the county's taxpayers. The small industries powered from the landfill are designed with mutual synergies: lumber mill culls become the prime material for a pallet manufacturer, and the waste from methane bio-digestion becomes the main ingredient for making agricultural fertilizer. This project will save the county taxpayers more than US$7 million over a fifteen-year period, and has created over 500 jobs to date.

Such methane projects are the result of cooperation between local, state and federal government, non-profit corporations, and foundation partners. Local community colleges and regional universities are involved. Industrial capital needed the participation of government to help incubate these new firms, to design energy- and waste-efficient manufacturing, and to rethink and stimulate niche markets.

These examples are but a few of the innovations that are emerging across Appalachia. In order for this sustainability movement to flourish, we must answer the following questions:

- How might knowledge be leveraged, transferred, and applied more effectively?
- Can capital formation be conceived of in more beneficial and egalitarian ways?
- Can such a movement advocate for policies at the local, state, and federal levels that will encourage these important new developments?

In November 2005, we started to answer these questions. Appalachian State University (ASU), Wilkes Community College, and the Appalachian Coalition for Just and Sustainable Communities (ACJSC) together hosted a regional conference on sustainable industry and livelihoods creation. Sixty-five stakeholders from industry, government, education, research, and civil society came together to assess our current industry and livelihoods situation. We agree that Appalachia enjoys the following comparative advantages: renewable energy sources and ecological services from the remaining forests and watersheds, and relative proximity to large eastern markets. We also benefit from mountaineer understandings of nature's diverse bounty and limits in a local economy. Participants need better access to important technical, investment, and collaborative information beyond the region. One way this is being facilitated is through the ACJSC national and global network that includes the UN Commission on Sustainable Development.

Conference for sustainable industry

Our November 2005 conference made clear many policy reforms that are needed because current economic models are unsustainable. First, state and local governments need to play a greater role helping and protecting small farmers and businesses as they revitalize local and regional markets. Second, better support and incentives for cooperative business structures would

"I had this crazy idea that the government ought to be for the people." (Barry Edwards, Director of Utilities and Engineering, commenting on his desire to initiate the landfill methane project)

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FIGURE 4 Students replace blades at Beech Mountain research site. (Photo courtesy of ASU Small Wind Initiative)

"Human agency very often leaves room for individuals or even entire communities to maneuver within or around the world economic system." (Donald Davis, in Where There Are Mountains*)*

help to revitalize equitable development at the grassroots. Third, a thorough review of state and local industrial recruitment goals and tax policies could provide both incentives and needed funds for smaller and larger green enterprises. A related fourth point is that a major commitment of state (and federal) investments in research, development, and joint public–private seed capital for sustainable industry is necessary if any substantial greening of the economy is to occur. Finally, we understand that eco-efficiencies alone are inadequate to bring ecological footprints within biophysical limits. We, therefore, see a governmental role in providing both early incentives and then sequential goals for households, businesses, and industries as they adopt workable sustainable production and consumption guidelines.

History ties ASU in Boone to this movement, since its Earth Studies Program of the 1970s blazed the trail for its current Sustainable Development Program. Today, ASU is also home to the Western North Carolina Small Wind Initiative. One of the chief findings of the Howard's Knob research was that scale mattered, so "small wind" is a technically appropriate focus for professor Dennis Scanlin and his colleagues at ASU. They have done public workshops and consulting, legislator education, and technical research at a six-turbine demonstration site atop nearby Beech Mountain (Figure 4).

Challenges and the way ahead

Just south of Howard's Knob and across the valley from Beech, stands a reminder of inappropriate economic development and its lingering consequences. In 1982, an out-of-state developer leveled the top of Little Sugar Mountain to erect a 10-story condominium. It was promoted as economic development in a "poor county," but to local residents it was seen as a desecration of nature. The North Carolina General Assembly enacted the Mountain Ridge Protection Act in July 1983 to prevent further development on mountain ridges.

Ironically, this law has been used to bar wind projects, as the Tennessee Valley Authority discovered in 2002 when it withdrew its proposed utility-scale wind project west of Boone after the North Carolina Attorney General's unfavorable reading of the statute. ASU Energy Center director Dennis Grady believes "utility-scale wind energy is as much a legal, political, and economic question as it is an engineering and climatic one." Yet renewable energy may well have an important ally. Watauga County Commissioner Winston Kinsey sees considerable support from rural natives. He argues that many see small-scale wind energy as part of a rural land preservation strategy that can help farmers struggling to keep their land from developers.

We wish to conclude by saying that Appalachia is a region capable of creating its sustainable future. Counter to stereotypes of poverty and fatalism, its diverse cultures are industrious, and its people have a strong history of reciprocity, sharing and commons-making. If our regional sustainability movement is to succeed, we must integrate these experiences, encourage critical analyses of local and global scale and then "make the road by walking." It has been nearly 30 years since Howard's Knob. As the *Limits to Growth* authors say in their 30-year update, "we do not have another 30 years to dither."

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