

# Asheville, North Carolina



Photo: City of Asheville, NC

# Asheville

CASE STUDY

**SOLAR  
OUTREACH**



**PARTNERSHIP**

# Asheville, North Carolina

Asheville, a unique community where progressive culture blends with Appalachian tradition, offers a remarkable experience for residents and visitors alike.<sup>2</sup> The county seat of Buncombe County, Asheville has a population of 85,712 and covers approximately 45 square miles. The city operates under the council-manager form of government: policy is set by the city council, which consists of a mayor and six at-large council members elected for staggered four-year terms. Day-to-day management, including supervision of department heads, is handled by a professional manager hired by the council.

Asheville's solar story is one of strong community leadership, collaboration, and creative thinking.

Many cities struggle to meet peak energy demands; for Asheville, peak demand occurs during the cold of the winter months. In 2006, [Progress Energy](#)—the regional power company that serves the Asheville area—proposed constructing a peak energy facility to address seasonal demand, but Asheville's citizens motivated by the perceived environmental impact of the plant on the region mobilized politically to stop construction of the plant.<sup>3</sup> This left Progress Energy with a conundrum: without building a power plant, how could it provide reliable energy to 130,000 retail customers in western North Carolina, “as well as to the customers of electric cooperatives and municipally owned utilities.”?

Progress Energy's response was to engage the community; the first step in that direction was the formation of a regional stakeholder group, the [Community Energy Advisory Council \(CEAC\)](#)<sup>4</sup>, to work with Progress Energy on how best to meet the energy needs of the region—specifically, the management of peak demand.

The CEAC included representatives from local government, environmental organizations, renewable energy companies, and area businesses. Progress Energy chairman and chief executive officer Bob McGhee challenged the group to think about the needs of a growing population in the context of potential environmental impact; specifically, McGhee asked the CEAC to help the utility company in the following ways:

- Ensuring that the energy efficiency programs put in place would work in the real world and fit well with the region
- Helping to build strong community support for, and participation in, efficiency programs, by capturing the attention and interest of citizens
- Providing perspective on options for power generation, as well as other related issues.

At the first CEAC meeting, appointed members to the group were given an overview of the utility system's operations and responsibilities, particularly in light of a power purchase agreement—set to expire at the end of 2009—that supplied a significant portion of the energy used by Progress Energy's customers in western North Carolina.

Through the CEAC, Progress Energy educated customers and business, government and environmental leaders from the community about the perspective of the utility, including technical challenges and regulatory barriers that could affect various courses of action. Maggie Ullman, chief sustainability officer for the City of Asheville, characterized the CEAC process as “awesome”: according to Ullman, rather than being attended by the utility's public relations officers, CEAC meetings were attended by the company's “highest-level strategic planners.” Ullman noted that “the head of distribution would come and talk with us, as did the president of the company, Lloyd Yates. They were putting serious people in front of us, and they really opened up. . . . We all got a good education . . . on the complexity of the issues.”

Ultimately, Ullman felt that the CEAC “primed the pump” for the community's approach: “The focus was not a bunch of citizens going to the utility and saying, ‘You should do this’; it was . . . the group saying ‘This is what we should do.’ We were empowering each other to take . . . leadership.” According to Ullman, the CEAC process revealed two dominant themes: community recommendations for renewable energy programs, and energy efficiency programs that the utility could start. CEAC members also considered how best to use the “leadership-by-example opportunities” that were brought up in the course of CEAC meetings. Many of



the members of CEAC took the lessons learned from their involvement with the committee and found ways to integrate solar PV into their own institutions.

The CEAC met for two years, ultimately producing a series of detailed recommendations to the utility on how to meet the region's energy needs. Equally important, the process yielded an empowered group of community members who were ready to take on the next challenges—collectively.

Even before the CEAC was created, the City of Asheville had made a commitment to sustainability by establishing a commission to advise the city council on the development of a carbon reduction plan. The plan approved by the council in 2007 included a reduction of greenhouse gas emissions by 2 percent per year, until an overall reduction of 80 percent was achieved.<sup>5</sup> In 2008, to lead this effort, the council formed the Office of Sustainability, whose first priority was the development of a sustainability management plan. In 2011, the American Academy of Environmental Engineers and Scientists recognized the plan, both for its specific initiatives and for the city's success in meeting the plan's goals.

## Asheville Goes Solar

Once the citizens of Asheville had determined that the construction of a new facility to meet peak demand ran counter to their vision of sustainability, business, local government and environmental leaders began searching for ways to keep the region on track. Among the strategies were a number of solar deployments.

### Hilton Asheville Biltmore Park

In March 2009, the newly constructed [Hilton Asheville Biltmore Park](#)<sup>6</sup> installed rooftop solar panels that provide 2,000 gallons of hot water to the hotel every day, eliminating 60 tons of carbon dioxide emissions every year. The Hilton Asheville is the first Hilton hotel to install a large-scale solar hot water system—and at the time of construction, the hotel's system was the largest of its kind in western North Carolina.

### Evergreen Solar Farm

In March 2010, [FLS Energy](#)<sup>7</sup> installed [Evergreen Solar Farm](#)<sup>8</sup>, a 555-kilowatt (kw) array, on the site of the closed Evergreen Packaging landfill, about 30 miles west of Asheville, in Haywood County. The EPA encourages the use of a brownfield site,<sup>9</sup> for renewable energy development.



**Solar panels on the roof of the Hilton Asheville Biltmore Park.**

Mike Cohen, a spokesman for Evergreen Packaging,<sup>10</sup> said, “We thought this would be a great use of that property. Our attitude was that if there was a way to produce clean energy from that landfill, we wanted to work it out.” The arrangement made sense because the landfill cannot be used for development or agriculture for many years.

Through the Evergreen array, area residents receive about 730,000 kilowatt-hours (kWh) per year through Progress Energy's distribution grid. The array was installed through a power purchase agreement: under this arrangement, FLS operates the system and sells the electricity generated by the 2,300 solar panels to Progress Energy. Evergreen Packaging gave FLS a 20-year lease on its land for \$1 per year.

The project was not straightforward and required creative design solutions. Thanks to those solutions, Evergreen Solar Farm became one of the first large-scale photovoltaic systems in the country to occupy landfill space. FLS's engineers noted, for example, that what looked like a grassy hill was actually tons of waste that was continuing to settle, compact, and shift. A protective membrane that sealed the contents of the landfill, so that the soil could not be penetrated, compounded the design problems. “Normally, you just dig into the ground and create your support for the panels,” said FLS president Dell Freudenberger—but in this case, everything had to be designed to sit aboveground. After conducting geotechnical surveys, FLS's designers created a concrete base that was heavy enough to support the panels in strong winds, but not so heavy that the structure would sink into the ground.



Biltmore Estates Solar Array, Asheville, NC<sup>11</sup>



Solar panels on Neo Cantina<sup>13</sup>



Biltmore Array from Interstate 40<sup>12</sup>

## Biltmore Estate

In December 2011, Biltmore Estate installed a six-acre, 1.5 megawatt system of 5,000 solar panels; among the largest installations in western North Carolina, it can be seen from Interstate 40, in Asheville.

Chuck Pickering, the Biltmore Estate's vice president for agriculture and government relations and a member of the CEAC, noted that part of the vision for solar can be credited to George Vanderbilt, the estate's founder, who intended to develop a self-sustaining agricultural operation that would emphasize stewardship of the land and its resources. "We are looking at ways to really make a difference, both within our agricultural operations and our energy supply," said Pickering. Ultimately, the goal is for the entire Biltmore Estate to have net-zero energy usage.

The system uses Bosch panels, chosen for their

track record in Europe, where cloudy days can decrease performance. Pickering reported that the panels are testing at 12 percent above norm.

## Green Dining

In 2011, the [Blue Ridge Sustainability Institute](#) (BRSI) applied for funding from the American Recovery and Reinvestment Act to establish Asheville as America's first [Certified Green dining destination](#). BRSI and [Asheville Independent Restaurants](#) worked together to gain certification from the Green Restaurant Association—focusing primarily on energy retrofits, including the installation of solar water heaters. In November 2012, Asheville met the goal and was designated as [America's first Green Dining Destination](#). Through the efforts of the program, eight of seventeen restaurants that participated in the initiative were fitted with solar hot water systems (one restaurant had already installed a system before the program). Not every restaurant was eligible for the program.

Tim Ballard, director of BRSI, noted that the systems are working well, but we did have some challenges in the project. We did not have the solar expertise that we needed to make the process smooth. There was extreme variation in system design, so that made it difficult. Different companies had different needs (sizing and storage), and we did not have some of the . . . data that would have made the process more efficient. We also had some historic preservation concerns, which prevented some installations.

Ballard also noted that "not everyone wanted a system." According to most participants and diners, the program has been a huge success. BRSI is now examining how to transition the initiative into a larger program for sustainable business development.



## First Congregational United Church of Christ

In 2011, the 85-year-old [First Congregational United Church of Christ](#)<sup>14</sup> installed a 10 kW solar photovoltaic system on the roof of the building adjacent to the church. The church is one of only a handful of churches in the state to install solar panels; what is most interesting about the project, however, is the financing model. Because the church is not eligible for state or federal tax credits, the congregation worked with the [Appalachian Institute for Renewable Energy \(AIRE\)](#),<sup>15</sup> a nonprofit that helps entities such as houses of worship, nonprofits, schools, and governments take advantage of tax credits they might otherwise miss out on. AIRE helped the church set up a limited liability corporation (LLC), First Church Solar, which includes six private investors. The private investment entity enables the solar installation to be eligible for a 65 percent tax credit (30 percent federal and 35 percent state).

The system is connected to the electrical grid, and [Progress Energy](#) and [NC Green Power](#) pay the LLC for the energy it generates. The investors expect to earn back their money in five years, after which they plan to donate the solar panels to the church. The system, installed by [Sundance Power Systems](#) (a CEAC member), generates enough electricity to power two homes in western North Carolina for a year.

## Electric Vehicle Charging Stations

In 2011, BioWheels RTS (now Brightfield Transportation Solutions)<sup>16</sup>, received a grant from the North Carolina Green Business Innovation Fund to design and install solar-supported electric vehicle (EV) charging stations and to partner with community organizations to educate consumers about the availability and use of the stations. Along with the grant funding, creative partnerships and innovative solutions enabled the city to expand and demonstrate its commitment to sustainability and solar energy.

The initiative is notable for two characteristics: the use of public land, and an innovative strategy that prevented the project from being derailed by a state policy. Under state law, only regulated utilities can sell electricity; third parties cannot. But Brightfield came up with a solution: instead of selling the energy to charge the car, Brightfield sells parking spaces for limited times.

Brightfield's business is based on enabling cars to drive on sunshine—and challenging folks to think beyond coal and nuclear energy. The charging stations are located on prime public real estate, which the city



Solar panels are installed on First Congregational United Church of Christ



City of Asheville Electric Vehicle Charging Stations

agreed to lease to Brightfield for \$1 a year.

## Solarize Asheville

In August 2013, inspired by a [model](#) that had originated in Portland, Oregon, in 2009, Asheville established the Solarize Asheville. Through group purchasing, coupled with outreach and education, the Portland initiative had succeeded in solarizing 560 homes in one year. Other communities learned about the program and adopted it; eventually, the U.S. Department of Energy (DOE) became interested in the approach, and began funding the [SunShot Initiative](#)—whose principal goal is to “make solar energy cost competitive with other forms of electricity by the end of the decade.”<sup>17</sup>

Solarize Asheville is directed by Katie Bray, of BRSI, with financial and technical support from the

DOE, Fred and Alice Stanback, and the AB-Tech Global Institute for Sustainability Technologies. The first Solarize program in the southeastern United States, Solarize Asheville began with a group of neighbors who wanted to go solar, but didn't know where to start. They believed that if they could organize a group of neighbors to "go solar" together, they could collectively make an informed purchase and negotiate a volume discount.

What makes the Solarize program unique is its approach to the three biggest market barriers for residential solar: cost, complexity, and inertia.

The Solarize program addresses cost through group purchasing. According to Bray, Solarize Asheville began by sending a request for proposals to 34 solar installers in the southeast: "We included tiered pricing, so that the more people that sign up, the cheaper it is for everyone." After carefully reviewing the four proposals, Solarize Asheville selected [Sundance Power Systems](#), a member of the CEAC, as the installer, because "they had the most detailed, thoughtful plan"—as well as the lowest price. Bray noted that the tier one price locked in for homeowners "is already 26 percent below the state average for North Carolina." In addition, homeowners receive a 30 percent federal tax credit and a 35 percent state credit. The financing partner for Asheville is [Admirals Bank](#), a Boston-based institution that provides homeowners with no-money-down loans for solar installations. Home equity is not required, and loan payments are typically lower than electrical bills.

The second barrier the program addresses is complexity, and the reluctance it can engender. A solar purchase can be daunting; it means selecting a contractor and addressing technical issues such as inverter efficiency, the size and type of panels, and optimal array tilt. Solarize Asheville addresses such issues through outreach and education. At the first Solar 101 event, on August 29, 2013, representatives from DOE and Admirals Bank discussed the investment side of solar (that is, why it makes financial sense for homeowners), and a representative from Sundance and a tax expert addressed utility and tax issues for homeowners.

The third barrier is inertia. According to Bray, because of permitting and codes, installing solar can sometimes take two to three years; the Solarize program gets solar installed in three to six months. "Solarize really works," said Bray. "We are minimizing the 'soft costs' of solar, which can account for 40 to 50 percent of the cost of the system. Soft costs are the costs associated with permitting, inspection, utility interconnection, financing"—the part of solar can potentially

confuse and intimidate homeowners. "Asheville has addressed all of this and makes solar easy."

Asheville residents who install photovoltaic panels on their roofs are "going local" with respect to energy production, lowering their energy bills, reducing their carbon footprint, and increasing the value of their homes—all while leading the way toward a cleaner energy future. [Erika Schneider, director of communications for Sundance Power Systems](#), said, "This initiative has the potential to bring solar to the Asheville community on a significant scale, and we're very excited about that."<sup>18</sup>

## The Future of Solar in Asheville

Discussing the challenges and opportunities that lie ahead for solar, Maggie Ullman, Asheville's chief sustainability officer, noted that

the incentive structure in North Carolina is great, but the city government can't get any of the tax credits, which means we are going to leave 65 to 80 percent of the money on the table. That makes it hard to finance some of the systems. If we want solar, then we really need to look at public and private partnerships and utilize public land where its available, and set up lease agreements.

Recently, the city created the Renewable Energy Public/Private Partnership Policy, to address these and related issues—in particular, to ensure clarity on the structure of public/private partnerships, and to create as much opportunity for such partnerships as possible by maximizing the use of public assets. For example, the city is currently exploring a partnership with Sundance Power Systems to install a 250 kW array on the roof of the civic center.

Asheville is also developing incentives to encourage solar development. Although the city cannot offer anything close to the 35 percent state incentive, it can, for example, provide rebates on permit fees. Ullman noted that such efforts don't necessarily "tip the scales of whether a project will happen," but they are "good faith" incentives, meaning that they demonstrate a commitment to the process. Along the same lines, the city is working on streamlining the permitting and ordinance processes, and the [North Carolina Sustainable Energy Association](#) is working on a comprehensive state ordinance on the permit process.

A final word about the future of solar was offered by Brownie Newman, a former member of the Asheville

City Council and currently the commissioner of Buncombe County and vice president for business development for FLS Energy. Newman noted that “small and municipal projects are becoming more difficult. Incentive funds are no longer available, the financing is more difficult, and the legal and due diligence costs are high.” Newman also observed that although homeowners who receive the 30 percent federal tax credit will see their tax bills reduced small businesses or municipal projects that attempt to obtain such tax credits find the process very complicated: every transaction is expensive.

Finally, Newman noted that we need to challenge ourselves to think bigger. The world doesn’t need a little bit of solar power, it needs a lot of solar, or else it doesn’t have an impact or make a difference. Let’s identify all projects and properties that are suitable for solar and then put it on all of them. Don’t put solar on one school; put solar on all of the schools.

## Contacts

Tim Ballard, director, Blue Ridge Sustainability Institute; 828-777-4248; [tballard@blueridgesustainability.org](mailto:tballard@blueridgesustainability.org).

Katie Bray, director, Solarize Asheville, Blue Ridge Sustainability Institute; 651-245-3100; [kbray@blueridge-sustainability.org](mailto:kbray@blueridge-sustainability.org).

Brownie Newman, commissioner of Buncombe County; vice president for business development, FLS Energy; 828-350-3993; [Brownie.Newman@buncombecounty.org](mailto:Brownie.Newman@buncombecounty.org).

Dudley Orr, vice president, Phillips and Jordan, Inc.; 865-688-8342; [dorr@pandj.com](mailto:dorr@pandj.com).

Maggie Ullman, Chief Sustainability Officer, City of Asheville, 828-271-6141; [MUllman@ashevillenc.gov](mailto:MUllman@ashevillenc.gov).

## Endnotes

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## Author

AK Consulting, LLC



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