

Cincinnati, Ohio



Photo: Cincinnati, Ohio

Cincinnati

CASE STUDY

SOLAR
OUTREACH



PARTNERSHIP

Cincinnati, Ohio

Cincinnati, known as the Queen City, is the third-largest city in Ohio; its estimated 2013 population of 297,517 people live within 77.9 square miles. It has an operating budget of \$996 million and employs about 6,000 people. The city is governed by a mayor and city council, who set policy direction, and a city manager, who oversees day-to-day operations.

Early in its history, the city experienced significant growth, thanks in part to the Ohio River—a major transportation route for industry and raw materials. Today, various national and international companies, including American Financial Corporation, Duke Energy, The Kroger Company, Omnicare, Cincinnati Milacron, and Procter & Gamble, are headquartered there.

Tucked into the country's Rust Belt, this once industrial town is becoming known for big ideas and business models that could very well lay the groundwork for the future of the solar industry in many of the nation's cities. Mark Fisher, director of facilities at the Cincinnati Zoo, summed up Cincinnati's current economic and energy climate: "In Ohio, you have cheap power and crappy weather—two strikes right off the bat—but we hit a grand slam."

The "grand slam" is the largest publicly accessible solar array in the country—a 1.6 megawatt (MW) parking canopy located at the **Cincinnati Zoo**. This array, which provides shelter and shade for visitors' automobiles and generates 22

percent of the zoo's power annually,¹ is just one example of the city's vision for a sustainable future, which started years before with the election of Mayor Mark Mallory.

Leadership and Vision from City Hall

In December 2005, Mark Mallory was sworn in as the 68th mayor of Cincinnati. During his campaign, he announced that he would re-create the city's environmental office and revitalize the city with bold economic initiatives. The decision to "green" the city was, in part, the result of findings in a report by the Brookings Institute called *Shrinking the Carbon Footprint of Metropolitan America*. The report quantified the most significant sources of carbon emitted in metropolitan areas in 2000 and 2005. For Cincinnati, the region's heavy reliance on coal for electricity; its limited public transit system; and the heavy freight traffic on the I-75, I-71, and I-74 corridors were the biggest contributors. As reported by the *Cincinnati Business Courier*, the Brookings report **ranked Cincinnati third** out of the 100 largest metropolitan areas in the country for having the largest carbon footprint. This poor ranking worried city leaders, who saw it as an impediment to the city's ability to compete economically.

In his first city budget, Mayor Mallory fulfilled part of his commitment by re-creating the Office of Environmental Quality, and he hired Larry Falkin to direct that



Photo courtesy of the Cincinnati Zoo

Aerial of the 1.6 MW Solar Parking Canopy at the Cincinnati Zoo



Cincinnati City Hall

office and spearhead environmental issues for the city. Falkin explained that signing the [U.S. Mayors Climate Protection Agreement](#) was an important step in actualizing Mallory’s vision. According to Falkin, “Mallory wasn’t sure how he was going to reduce greenhouse gas emissions, but signing the Climate Protection Agreement set a direction, and we launched the process of creating what is now called the Green Cincinnati Plan, though, at the time, we were calling it a [climate protection action plan](#).”²²

The mayor appointed a steering committee to oversee the development of the plan. The steering committee comprised 150 subject matter experts divided into five “task teams” in the areas of energy, transportation, land use, waste management, and advocacy. Among them were the presidents of the chamber of commerce, Duke Energy, and the University of Cincinnati; labor leaders; and representatives of local environmental, neighborhood, and community groups. Completed in 2008, the climate protection plan outlined an economic development strategy that focused on being able to contribute to the wind and solar supply chains and reduce dependence on grid electricity. The city aimed to install solar panels on municipal and other buildings, and to build solar and wind components for sale in other places.

The city council adopted the steering committee’s plan with a nearly unanimous vote, an action that, according to Falkin, carried a lot of significance: “Cincinnati is a deeply divided city, and a city where we would expect a sustainability plan to be somewhat controversial. But because the plan was developed with everybody at the table, and because our touchstone from the beginning was not just reducing greenhouse gases but reducing greenhouse gases in a way that did other things that were important for the

community—it created jobs, saved money, improved public health, and took care of all of the members of our society—it ended up with universal support.”

Instruments of Growth

Ohio’s [Renewable Portfolio Standard \(RPS\)](#), which the state legislature passed nearly unanimously in 2008, complemented Cincinnati’s action plan. Among other recommendations, the RPS required utilities in Ohio to buy renewable energy to meet a portion of their energy needs. Typically, when Ohio utilities buy renewable energy, they are buying [renewable energy credits \(RECs\)](#). RECs are the legal instrument that represent the “green” attributes of power and provide the accounting of electricity that comes from renewable energy and nonrenewable energy sources.



Solar Parking Canopy at the Cincinnati Zoo

RECs are one of the reasons behind a number of solar projects in Cincinnati, including the zoo installation, which, on some days, produces more power than the zoo can use and thereby provides extra power to the grid. Using a variety of incentives and programs, including utility incentives, federal grants, and [power purchase agreements \(PPAs\)](#), the city has installed solar arrays on twenty-three municipal properties; installations on fourteen sites were done with stimulus grants provided through the American Recovery and Reinvestment Act (ARRA). The three most recent projects make up 500 kilowatts (kW) of installed solar photovoltaic (PV) and were done through a PPA with a local energy developer, [Solar Power and Light \(SP&L\)](#) as Phase I of a two-phase project for the city. The first phase entails installed arrays on a municipal garage, the city permit center, and the

College Hill Recreation Center. Phase Two proposes to add another 2 – 5 MW of solar for the city.

The Duke Energy Convention Center is one of the sites in Phase Two. Currently, the center has 100 kW on its roof, which were installed using ARRA funds. According to Brent Boyd, CEO of SP&L, “The plan is to add another 500 kW and consider some other types of custom solar PV that would be visible from ground level. Panels visible from the ground level have PR [public relations] and marketing value that would help attract ‘sustainability-centered’ conventions and conferences.”

One of the challenges facing the city regarding installing solar is finding sufficient roof space to support the systems. Many buildings in Cincinnati are older and cannot handle the weight of installations. When the convention center project is completed, SP&L plans to build a large solar farm on vacant city-owned land.

One important aspect of a PPA is that it allows a city or a tax-exempt nonprofit to take advantage of federal [investment tax credits \(ITCs\)](#) and other tax incentives, while private owners can take advantage of tax credits to defray the cost of construction. All too often, solar may not be cost-effective without those incentives. Through a PPA, a local government can sometimes install solar without using capital dollars.

The PPA between the City of Cincinnati and SP&L is a twenty-year contract. SP&L installed the system, and the city agreed to buy the electricity generated by the array at a rate slightly below current market value. The city believes that electricity rates will increase over a twenty-year period, so buying electricity at a fixed price for that time span helps the city hedge against future increases. As a business, SP&L makes a profit by buying RECS, selling electricity, profiting from depreciation



Ground mount system at the City's Parks and Recreation building.

on the array and taking advantage of incentives like ITCs, which the city cannot use. As Boyd said, “The solar facility that sits on top of the [College Hill Recreation Center](#) is our asset, our personal property. We have an easement agreement with the city to put our personal property on their building, and they agree to buy the electricity generated from those facilities over twenty years.”

Renewable Portfolio Standard Policy Changes

For a while, the biggest challenge Cincinnati faced was finding sufficient viable roof space to support its solar objectives. In July 2014, this challenge became more complicated. After a heavy debate, the Ohio State Legislature voted to make the state the first to [freeze its RPS](#). Falkin explained the vote as follows: “The business community really came down on both sides. Some felt like the cost of buying RECs was more than they wanted to pay and others felt like the cost of buying RECs was a good investment, because it tipped the supply-and-demand equation for energy in the state in a way that lowered the market prices. The business community was divided. It was the utilities that wanted the repeal.”

Defense and support for the RPS came from what Falkin described as a [surprisingly diverse group of constituents](#). “There were, of course, environmental groups and citizen groups that were ideologically supportive of renewable energy, but there was also support from the state consumer counsel’s office, because their data showed that the renewable portfolio standard was saving Ohio businesses and individuals money on their utility bills.” Support also came from the Ohio Manufacturers Association, which represents big users of electricity. According to Falkin, members of that group mostly believe that the RPS was saving them money and creating opportunities for them to sell their manufactured products.

The RPS was not repealed; instead, the legislature determined that it needed to be “evaluated for efficacy” and thus put it on hold for two years to analyze how the program was working. The action reduced the obligation of utilities to buy RECs during that time and reduced the value of RECs in Ohio, which was not a debilitating decision, but, as Falkin said, “makes it harder for solar deals to be profitable.”

Fortunately, the legislature’s decision has not dampened the enthusiasm among solar supporters and partners; in some ways, it provides an opportunity for new



Array on the Permit Center



Array on the College Hill Recreation Center



Array on the Duke Energy Convention Center



Aerial of the Solar Array on the Duke Energy Convention Center

ground. SP&L's Boyd believes that this is an opportunity for the market to evolve and help lower many of the soft and hard costs related to solar, making it financially viable without reliance on incentives: "The goal is to reduce the cost of solar to about a dollar a watt by 2020. If I can build solar for a dollar a watt, I don't need an incentive. RPS is an interim, a stopgap that incentivizes solar construction until . . . we don't need it."

New Solar Financing Tools

One of the tools that Cincinnati has recently adopted to ensure a strong future for solar is [Property Assessed Clean Energy](#) (PACE) financing to finance energy efficiency and renewable energy improvements in private sector buildings at no cost to the local government. Falkin described how PACE works in Cincinnati: "A special tax assessment is placed on the

property being improved. The municipality collects that tax money, plus interest, and uses that money to pay off the bonds. The building owner gets his building or her building fixed up at no up-front cost, and pays for it over time at municipal bond rates." Local governments are tax-exempt entities and do not pay property tax, but they can volunteer for a tax assessment, which is how they make the program work.

PACE in Cincinnati was initiated in partnership with the [Greater Cincinnati Energy Alliance](#) (GCEA)—a non-profit organization focused on reducing energy costs in the region. The organization was founded five and half years ago on the premise that municipal governments need to work together to drive a greater impact in the energy efficiency marketplace. GCEA functions as the program administrator for PACE, and it partners with the Port of Cincinnati Development Authority, which sells the bonds and administers the financing.

One of the first projects to take advantage of PACE financing was Cincinnati's new police station, which is slated to be a LEED Platinum, net-zero energy building—in part due to solar energy. The city will pay taxes on the building for twenty years. The voluntary tax assessment should prove to be less than the building's utility bills. After twenty years, the city will have a new municipal building with no taxes and no utility costs.

Another effort emerging from GCEA is the Solar Tax Equity Investment Fund. Andy Holzhauser, CEO of GCEA, said the fund will help address one of the key problems facing the solar market: "Since many nonprofit organizations or small and medium-sized solar contractors either do not have the tax appetite or cannot take advantage of the 30 percent federal tax credit, it is hard to make a project cash flow. GCEA aims to aggregate many of those smaller projects, put them into a 'warehouse facility,' and bring to bear the debt and equity investors necessary to create a third-party solution to owning solar projects and monetize that tax credit." Holzhauser admitted that it is a complicated model that requires raising capital—both tax equity investors and debt investors—but that it is something that the organization is committed to and that fits within GCEA's mission and infrastructure.

Lessons Learned

The lessons in Cincinnati are in leadership, partnership, and tenacity. Taking cues from national surveys and the city's existing industrial assets, the newly elected mayor quickly took advantage of what he saw were significant shifts in the sorts of economic development initiatives that make cities competitive. The Office of Environmental Quality was reestablished to spearhead initiatives that would reduce energy costs, meet greenhouse gas emission-reduction goals, and reinvigorate the local economy with green jobs. Leaders at city hall worked with a number of advisory and working groups to develop and implement specific goals outlined in the city's detailed sustainability plan. Volunteers and staff members met frequently with other nonprofit partners to review the direction of that plan, innovating when needed. While Cincinnati took advantage of any and all existing incentives and financing options, it looked beyond current models, developing new financial programs such as PACE and the Solar Tax Equity Investment Fund. These financial models can be more responsive to current market conditions, addressing the state's frozen RPS and allowing the city to continue to invest in a solar future.

Other Resources

Cincinnati Chooses 100% Green Electricity
<http://www.cincinnati-oh.gov/manager/news/cincinnati-chooses-100-green-electricity/>

Guide to Green Energy Financing and Incentives
<http://www.greenenergyohio.org/page.cfm?pageID=3783>

Ohio Renewable Energy Technology Program
<http://energy.gov/savings/aep-ohio-renewable-energy-technology-program>

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Endnotes

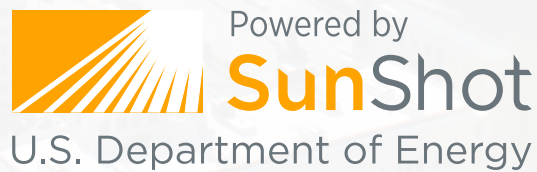
1. Unless otherwise noted, photos were taken by authors and information was obtained through interviews with the individuals listed under “Contacts.”
2. “Mayor Mallory Passes Green Cincinnati Action Plan,” *Cincinnati Beacon*, June 19, 2008.

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