

Franklin, Tennessee



Photo: Historic Franklin, TN¹

Franklin

CASE STUDY

SOLAR
OUTREACH



PARTNERSHIP

Franklin, Tennessee

Franklin is a historic community located in Williamson County, about twenty miles south of Nashville. About thirty square miles in size, the city has a population of 59,000. A unique and comfortable small-town vibe blends a vibrant business district core of retail and city offices with a new growth area on the town's perimeter. *Business Week Magazine* named Franklin one of the [Top 50 Cities to Start a Small Business](#).

Governed by Mayor Ken Moore and eight alderman, the city gained status as a solar community with a vision to be a sustainable community through a mix of political will and creative thinking.

A Vision for Sustainability

Prior to becoming mayor, Alderman Ken Moore was flying home from a business trip and read an article about the top 25 green cities in America. He noticed that no city in the Southeast was on the list, "much less Franklin, TN." He thought, "Franklin is a progressive community; why are we not on the list?" When he returned, he shared the article with then-mayor Mark Shore, and said, "Look at this list, we aren't on it." Mayor Shore responded, "It looks like a good job for you." In January 2011, Moore was elected mayor and began in earnest to pursue a significant solar energy presence in Franklin. He talked to people in the community, and they responded with ideas about various green initiatives.

Community Buy-in and a Sustainability Plan

In 2008, while Moore was still an alderman, he asked a friend from [Johnson Controls](#) to assemble a volunteer team and perform a sustainability analysis for the city. A workshop was held, attended by more than 250 people from the community. From the 2,000 ideas that were generated, the city created a Sustainability Commission comprising nine different committees. These committees worked for a year to identify and examine sustainability issues and to develop an action plan for

the city. At the same time, the city created sustainability goals for each of its departments. The 2009 [community action plan](#) was presented to the Board of Mayor and Aldermen. Subsequently, the city created a position for sustainability coordinator and further tasked the sustainability commission with creating metrics for the action plan and with continuing to advise city government on energy usage, solar photovoltaic (PV), wastewater, community recycling, solid waste, and other green initiatives. Some of the first measures the city took toward sustainability were to

- conduct an [energy audit](#) to assess usage and areas for cost savings
- conduct a [solar study](#) using GIS mapping to identify potential and ideal sites for solar
- create a recycling program and solid waste plan, which ultimately diverted 16 percent of waste from the landfill between 2010 and 2013
- establish energy goals for Leadership in Energy and Environmental Design (LEED) certification of municipal buildings.

The biggest challenge, according to Mayor Moore, was developing metrics, particularly those that would be associated with being a "top 25 green city." "It is important to have benchmarks," he said, "but they are not standard, and it is also important that any initiative has substantial payback in order for it to make sense." The city is now working on the [2013 Sustainability Plan](#).

Creative Thinking

Franklin successfully integrated solar into the community by taking advantage of the creative thinking among its staff and community. It installed a low-impact 200 kW array at the municipally owned wastewater treatment facility *at no cost to the city*. It also successfully integrated solar into its historic structures without losing the cultural integrity of the community.

Wastewater Treatment Facility

Franklin is a rapidly growing community with diverse needs and big goals. As other cities in the region have



Sign at the Wastewater Treatment Plant, Franklin, TN²

found, however, a dependence on sales tax revenue to capitalize city improvements has proven unreliable. The mayor tasked his staff to find ways to cut costs, including using solar and renewable energy to zero out the cost of power used by the treatment plant. One option was to place a solar installation project on the Capital Investment Plan list, but this option was not ideal because the city would not be able to capture the 30 percent federal tax credit and capital outlay required for a solar project. A second option was to seek grant funding. This option was determined to be even less viable, however, because of the amount of staff time required, the uncertainty of an award, regulatory and reporting requirements, and the unlikelihood that the grant would cover the entire cost of the array. The third option was a power purchase agreement (PPA). Planning officials began a discussion around this option and interviewed several firms before finally selecting [Energy Source Partners \(ESP\)](#), who offered a business model of “no money up front.”

Planning officials met with Ron Merville, ESP’s chief executive officer, and entered into a public-private partnership that consisted of a twenty-year ground lease of one acre of property to produce solar power. ESP provided the design, construction, funding, and maintenance of a 200 kW ground-mounted solar array at the city’s wastewater treatment facility. All the energy produced onsite is sold to the Tennessee Valley Authority (TVA) as part of the [Generation Partners Program](#). In return, ESP shares a percentage of the revenue with Franklin. As Merville explained, “We chose a 200,000 watt system (two tenths of a megawatt [MW]) with the idea of seeing how the whole thing would work—to see if it really can offset

some of the power costs of the treatment plant. First, does it work? Does it offset power? And if it offsets power, does it really generate the revenues that you say it’s going to?”

Mayor Ken Moore noted that “leasing this property allowed us to explore public-private joint ventures and to test this model while also keeping our options open for the rest of the 100-acre property.” Because the site is a former sludge field, the city did not want to turn any dirt (or sludge) but instead wanted to make the installation as low impact as possible. Andrew Orr, Franklin’s sustainability coordinator, described the system as follows:

This was all done very low impact. The ballasts weigh about twenty pounds each and they’re made out of recycled tires. Each row in the whole system is connected; we did not do any digging, and all of the panels were walked out and hand placed on this racking system, which was fabricated in Nashville. The panels were assembled in Memphis: [Sharp panels](#). Everything was a local product, very low impact. There’s grass underneath. I’ve seen other ground-mounted systems that are on concrete pads or have been secured by drilling into the ground. With this system, it could be disassembled and moved and no one would know that there was previously a solar system on-site. Ron Merville came up with this great design, and it probably saved him a lot of money, too.



Ground Mounted Solar Array at the Franklin Wastewater Treatment Facility, Franklin TN

The revenue generated from the solar power is split 80/20 in favor of ESP until the company has received payments totaling \$393,690. Staff estimates that the projected payoff point will be reached in the first quarter of the ninth year of the agreement, at which point, the revenue will be split 80/20 in favor of the city for the duration of the twenty-year lease. “This project is a public-private partnership that allows the City of Franklin to generate both revenue and renewable energy that lowers its carbon footprint,” said Merville. “Franklin will lead by example as a city committed to being a better steward of both its resources and the environment.”

The city anticipates earning \$11,530 per year until the estimated payoff in year nine, after which the average projected revenue is \$31,530 per year through the end of the lease agreement. At the end of the twenty-year lease, Franklin has the option to either buy the system and take ownership at fair market value, or request that ESP—at no cost to the city—remove all equipment associated with the project and restore the site to its original condition.

ESP used several incentives to bring the project to fruition, including a 30 percent federal tax credit; a Treasury 1603 Grant, an incentive that expired on December 31, 2011; five-year depreciation; and the TVA’s Generation Partners program (now referred to as [Green Power Providers](#)), which includes purchasing electricity at base retail rate plus 10 cents per kW/h and a \$1,000 cash rebate.

The project was a win for everyone. Andrew Orr acknowledged the benefit of working with the private sector: “They could design it, bring the money to the table, build it, maintain it. We got our contract approved in December and we cut the ribbon on May 1. That’s five to six months! There’s not a whole lot that you can do in city government in five or six months.” As ESP’s Merville explained,

We see the bills every month: the city furnishes them to us, and the system is performing as we thought it would. It’s generating the revenue we hoped for. Energy Source Partners sees cash, and the city sees a credit on its power bill; for all the power we produce, the bill never goes up. There’s an agreed-to number in the contract so every time they make a payment, it comes off dollar-for-dollar of that number. So when that’s satisfied, the 80 percent we now get flip-flops back. It’s very powerful, it should take less than ten years and with the life expectancy of system

at thirty to thirty-five years, it is a very good investment. The panels themselves have a full warranty for twenty-five years. The electronics have a warranty for twenty years. So all is good right now. We’ve been into it a little more than a year, and all went well. We built a facility that is a great showcase for demonstrating that all the power you generate is used and it could be constructed in partnership with a municipality.

The partnership between the two entities will continue for a second phase. The team made an application to install a megawatt of power at the wastewater treatment plant. The increase in production will raise the current \$5,000 monthly offset to a \$30,000 per month offset.

Historic Integration

Franklin approaches historic preservation in a way that is consistent with the city’s vision for sustainability, making it immediately compatible with solar technology. In 2010, the [Historic Guidelines](#) for the city were updated to include the use of solar PV on historic structures. According to Amanda Hall, preservation planner for the city, “Franklin is a historic community that maintains its identity while incorporating solar without compromising who they are. We start with the premise that historic preservation *is* sustainability, so solar fits well within that. Solar is not incompatible. When we revised the guidelines, we made sure that it was blessed by the state historic planning office as many of the buildings that solar was going on are listed on the National Register.” The National Trust for Historic Preservation also offers guidelines on combining [solar panels with historic preservation](#). Hall continued,

The important thing, we believe, is that a community should go ahead and prepare the process to allow people to include solar, because you could get a request for solar (from a resident or business), and if you don’t know how to handle it administratively—that is, what inspections are involved, etc.—then it causes problems and delays. We put Historic Guidelines in place because we are a progressive community and want to be prepared for these installations to go anywhere someone asks for them to go, provided they fit within the Historic Guidelines. By adding the Historic Guidelines for solar, it brings

attention to the fact that it is a possibility for our historic areas and advances our sustainability goals as a city.

The guidelines look at compatibility of materials, aesthetic choices, and colors; they emphasize the need to match existing roof materials as much as possible; and they ensure that arrays are not visible from the street or front façade. All solar panel installations must be considered on a case-by-case basis; the best option will depend on the characteristics of the property under consideration. The overall objective is to preserve character-defining features and historic fabric while accommodating the need for solar access to the greatest extent possible.

To date, the city has completed three solar projects in the historic district in Franklin: (1) solar panels on the roof of the Starbucks building at 438 Main Street behind a parapet and not visible from the street (left); (2) a 5 kW array on the roof of an office/business at 202 5th Avenue, a Dutch Colonial residence, where it doesn't face the main road (center); and, most notably, (3) a 200 kW array on The Factory at Franklin 230 Franklin Road (right). The Factory, which was built in 1929, occupies the buildings that once served as the Dortch Stove Works, Magic Chef, and later the Jamison Bedding Company. A member of the [National Register of Historic Places](#), The Factory is rich with history, and a very careful [renovation](#) has preserved many of its original features and architectural details.

While there was a vision for solar on The Factory before it was renovated, it was not until after the building was renovated that the solar PV was installed. ESP's Ron Merville and Factory owner Calvin Lehew initially approached the city about the solar installation, but because the process had to go through historic zoning review, it took much longer than anticipated. This project was actually proposed before Merville took on the municipal wastewater treatment facility. "I talked to Calvin about it first and proposed a lease agreement and a 200 kW array," Merville said. "Calvin was interested. He's an early adopter of renewable energy and all things green. If it's green, Calvin's into it. I talked to him and he said, 'well, let's try it, let's see



The Factory, a renovated manufacturing building that now houses boutique shops and restaurants, Franklin, TN.



Solar arrays on historic properties in Franklin, TN. Left to Right, Starbucks Coffee, Dutch Colonial Home converted to a business, and The Factory.

what we can do.’ So we went to the city and made our spiel, gave them our drawings, and showed them what we wanted to do.”

The process for getting approval through the Historic Zoning Commission began as a result of this inquiry.

Since The Factory is a National Register property, the location of the array was an important consideration. The most pressing issue was that the array would be visible from all sides of the building, no matter where it was installed. Sustainability Coordinator Orr said, “The Factory really tested the limits with the historic zoning commission on what would be allowable. Before that, we really didn’t have a building in the historic district that had panels that you’re going to see when you’re driving by.” The design review committee at the Historic Zoning Commission determined that installing the solar array on the roof that faced a side street was less obtrusive than installing it to face the front. “We requested a physical material sample of the panels ahead of time and discovered that they take on the color of the sky, . . . and because it is an industrial-type building, you don’t really notice it so much. For this building, it really worked.”

The array was financed in part from a grant received through the [Tennessee Solar Institute’s](#) American Recovery and Reinvestment Act funds. To use these federal monies, the city had to ensure that the array would have no adverse impact on the building. The use of federal monies on projects that affect a property listed on the National Register, even if the money is distributed at the state level, must be reviewed in context of the Section 106 process in order to mitigate any potential damages that the federal government could inadvertently make to its own identified historic resources. Amanda Hall said, “I had to assure the State Historic Preservation Office that the City of Franklin did review this and found it appropriate. We didn’t feel it would cause any negative impact to this building.”

The Future Of Solar in Franklin

One of the challenges Franklin faces as the city looks to the future of solar is the reduction of incentives. As Andrew Orr noted,

The 30 percent rebate grant expired in 2011, and while the cost of solar is going down, incentives are drying up. There are [TVA programs](#) we can still tap into, but the program is limited/capped at 2.5 MW. The total program is 2.5 MW, and an individual project can

only be 50 kW, or one-quarter of the existing array at Franklin’s Wastewater Treatment Plant. That’s where it can be difficult to do these third-party, public-private partnerships: the payback on such a small array no longer makes sense. That’s why we’re thinking the RFQ [request for quotation] route. If you say “we’re going to do five or six fire stations, a solid waste facility, etc.,” you’re starting to capture an economy of scale. Maybe we can do 12 kW here, we can do 23 kW here, we can do 5 kW over there; if you can package enough of that, high enough, hopefully, you can attract somebody.

City Engineer Dan Allen added,

As you look forward, obviously, the trend is less and less incentives so you have to start thinking more about how you’re going to do it. How are you going to capitalize on energy savings and things like that? We’re not just repeating the same things we did before. While it may again be a lease agreement, there will be a different set of incentives and you have to be flexible, take advantage of whatever’s out there, size, scale, price. You can make the projects happen, you just have to be flexible and adjust to shifts in incentives as they change over the years. For example, we are examining the possibility of an RFQ and a formal selection process to identify a third-party group to help us program the rest of the city facilities. So, we’ll start looking at rooftops and fire stations, solid waste, and other things and see how we might make those things work.

The future of solar in Franklin also depends on answering other questions about zoning. While much of the residential process for installing solar has been streamlined, thanks to the [Rooftop Challenge](#) and what is referred to as the [Brooks Report](#), there are other issues to consider. City Engineer Dan Allen framed those issues as follows:

If I have a house that’s, say, 2,500 sq. ft., . . . and let’s say I’ve got five acres. If I want to put solar on my land—say, a 5 kW system—it’s not a big deal. You can classify that as an accessory-type use to the primary structure on the site. But if I took that same piece of land, same scenario, and now I want to put

up a huge array—cover up the rest of the property—now, all of a sudden, solar is not necessarily an accessory use to the primary structure because it overshadows everything else. How do you handle that from a land-use standpoint? Do you put a cap on a certain size? Do you say, up to a certain size, this is an accessory use to the primary structure? The reason that’s important is that we have a process with our codes official that streamlines the process and lets you bypass a lot of the site plan process with the planning commission. You can go straight into your building permits. But if someone makes a determination that it’s not an accessory use and it’s something bigger, that doesn’t streamline it because you’re going to have to do site plans and bigger submittals, and you’re going to have to go through a process just like you were doing a development.

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Endnotes

1 “Smart Growth Stories,” <http://www.smartgrowthamerica.org/2013/03/14/smart-growth-stories-mayor-ken-moore-on-balancing-preservation-with-growth-in-franklin-tennessee>

2 Unless otherwise noted, photos were taken by the authors.

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