# Lancaster, California

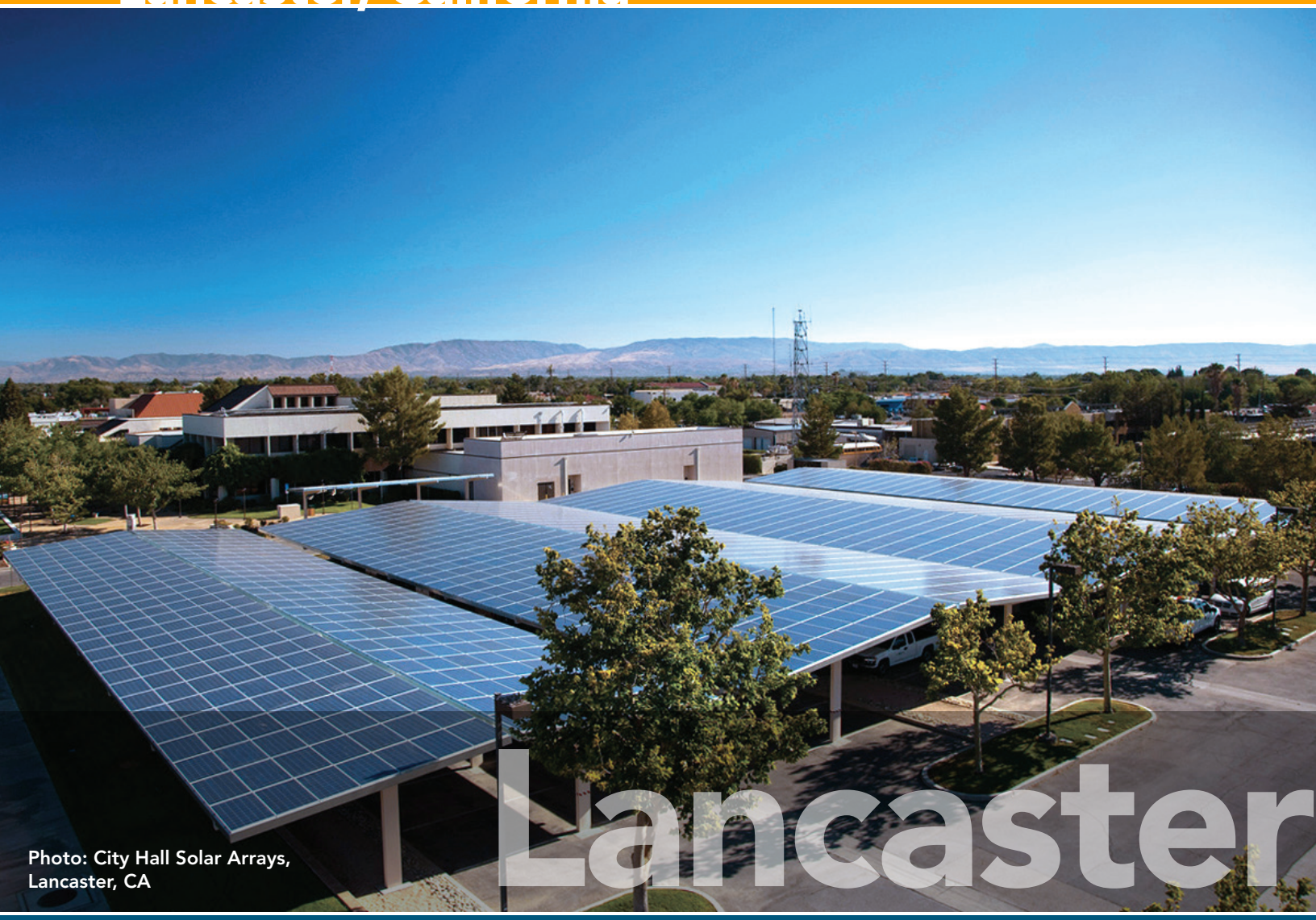


Photo: City Hall Solar Arrays, Lancaster, CA

# Lancaster

CASE STUDY

SOLAR OUTREACH PARTNERSHIP

# Lancaster, California

Lancaster, California, a city of 94 square miles located within the Antelope Valley in the High Desert region of North Los Angeles County, is known for innovation. With temperatures reaching triple digits in summer months and an ideal elevation in relation to the sun, Lancaster has a wealth of solar resources. Recognizing the economic, social, and environmental benefits of tapping this renewable resource, the city is using all available methods at its disposal to become the "Alternative Energy Capital of the World."

With a population of nearly 160,000, Lancaster operates under the council-manager form of government; 250 full-time employees help manage the city's $107 million budget. City leadership and staff, along with community advocates, are extremely committed to the city's renewable energy goals, especially as they relate to solar. City policies reflect this commitment. The city has created a pro-business environment, including an easy permitting process, and it has adopted solar requirements for new homes, the first program of its kind in the nation. Its strategic use of creative partnerships, including the creation of its own electric utility to develop solar projects, is helping Lancaster become a main hub of the solar industry.

**City Profile**

- Form of government: Council-manager
- Total population (2010 census): 159,5231
- Total geographic size (2010 census): 94.3 square miles[1]
- Number of local government employees: 250
- Major departments: Administration, City Clerk, Finance, Human Resources; Parks, Recreation & Arts; Public Works/Planning; Housing & Neighborhood Revitalization
- Total annual budget (2013–2014): $106,787,633[2]
- Type of electric utility: Southern California Edison

1. U.S. Bureau of the Census, "State and County Quick Facts," http://quickfacts.census.gov/qfd/states/06/0640130.html
2. Annual Budget Figure provided by Jocelyn Swain, Associate Planner, City of Lancaster, September 2013

## Lancaster's Ambitious Solar Goals

By harnessing the immense solar resources available to this High Desert community, Lancaster is making great strides to becoming the world's solar capital. Its culture to "go solar" is highly pervasive, as reflected by its ambitious goals to be one of the world's net-zero cities for electrical use by 2020. In 2011, Lancaster partnered with Beautiful Earth Group, a company that develops, owns, and operates utility-scale renewable energy facilities, to establish Lancaster as a net zero city.[1] The net-zero goal, defined by the city as the production or procurement of renewable energy that exceeds usage within city limits, has two phases. The Phase I goal is 215 megawatts (MW) at peak load; the Phase II goal is 530 MW, which is total city consumption in a twenty-four-hour period. As of late 2013, the city is 20 percent of the way toward meeting the Phase I goal, with 100 percent of this renewable energy production coming from solar. It expects to meet the Phase I goal by 2015 but has not yet set a target date for meeting its Phase II goal.

Lancaster is leading California in solar production per capita. In May 2013, the city generated 177 W of solar energy per capita. In comparison, San Jose and San Diego produced approximately 61 W and 38 W of solar energy per capita, respectively. As of August 2013, Lancaster generated 44 MW of solar (25 MW of utility-scale projects (projects that are 10 MW or larger) and 19 MW nonutility-scale projects, such as residential, commercial, and schools) with 7.5 MW under construction. In addition, 204 MW have been approved but not built and 20 MW more are under review. This totals 275.5 MW of solar capacity for both utility- and non-utility-scale projects.[2]

Most of the city's solar production comes from utility-scale projects as the city actively recruits solar developers who have been quick to recognize Lan-

### Major Solar Milestone Timeline

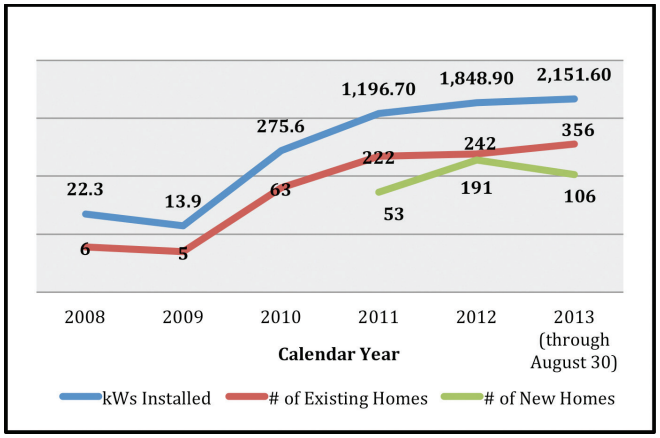
- 2008: Established goal of becoming "alternative energy capital of the world"
- August 2009: Partnered with eSolar to open a twenty-acre, 5 megawatt (MW) solar thermal power tower plant
- July 2010: Brought Build Your Dreams and KB Home together to build net-zero homes
- July 2010: Launched Solar Lancaster program
- March 2011: Created Lancaster Power Authority (LPA)
- Summer 2011: LPA partnered with Lancaster and Eastside school districts and SolarCity to develop solar photovoltaic energy on school facilities
- July 2011: Created High Desert Power Authority
- August 2011: Partnered with First Solar to develop a 230 MW utility-scale solar project
- September 2011: Partnered with Beautiful Earth Group to establish Net Zero City Goal
- August 2012: Created California Clean Energy Authority
- March 2013: Adopted residential solar requirement

caster's huge solar resource potential and deep support for clean technology and innovation. Currently, there are sixteen utility-scale projects either in operation or under way; these projects are expected to generate a total of 257 MW of solar energy. The number of solar photovoltaic (PV) installations on homes, businesses, schools, and city-owned properties has also risen significantly over the past three years. Figure 1[3] shows a dramatic increase in single-family residential installations; from 2008 through August 2013, the city has issued 1,244 single-family residential solar permits for a total of 5.5 MW.

## Benefits of City Leadership and Business-friendly Policies

The urgency of climate change has reached critical mass in Lancaster, where the mayor, city council, city staff, residents, and business leaders understand the implications of doing nothing. The mayor and city representatives look at climate change as a public safety issue. For a politically conservative community like

**Figure 1. Single Family Residential Solar PV Production**




Lancaster, framing climate change in this context has given the subject traction.

Mayor Rex Parris made this point at the Pathways to 100% Renewable Energy Conference in 2013, where he said, "One thing us Republicans are very good at is public safety—we don't screw around with public safety. What is this but a public safety issue and why aren't we framing it that way?"[4] This understanding about climate change and the need for a bottom-up instead of a top-down approach to fix the problem (i.e., a local government – driven process instead of a federally mandated one), coupled with the city's competitiveness to be net zero before any other city, is driving the community to go solar at a very swift pace. At the conference, Mayor Parris stated, "We intend to be net zero before anyone else and that competitiveness has captured the city and the urgency has captured the city. It is economically viable and technologically possible. Every house should have solar on it."[5]

In 2010, Los Angeles County Supervisor Michael D. Antonovich invited Mayor Parris to attend a meeting with China-based green energy technology and manufacturing firm Build Your Dreams (BYD), one of the world's largest suppliers of advanced battery technology. After Mayor Parris' trip to China to visit BYD's Solar Village where he witnessed BYD's commitment to clean energy, the city brought together BYD and KB Home, one of the U.S.'s largest homebuilders, to build net-zero production homes in Lancaster. Early in the process, BYD and KB Home had concerns about permitting and fees. In response, the city waived all building fees and made the permitting process easy. As a result of the initial partnership, three net-zero electrical homes were built; these houses can power a car and were the first in the nation to have smog-eating roof tile installed.

**Solar array at Lancaster's Performing Arts Center.**

> "The city of Lancaster truly understands the word "partnership": their low-cost approach of doing business provides endless potential for growth. Their commitment to the business community is evident from the top down, from the mayor and city manager to city staff. For example, the city approached us for insight when they proposed their new solar ordinance. While we are not supportive of mandates, the city listened to our concerns and welcomed our expertise. This inclusive process helped them create an innovative and flexible solution that best met the need of all stakeholders."
>
> *—Thomas DiPrima, executive vice president Southern California Division, KB Home*
>
> *Source:* Quote from interview with Thomas DiPrima on October 2, 2013.

The city also assessed and improved its permitting processes to make them smoother and more accessible for installers and residents. Lancaster now provides an expedited plan review for residential PV installations; a process that used to take several days is now an over-the-counter process that takes fifteen minutes. The city's planning and building departments worked together to streamline the residential PV installation process, which requires only an electrical permit rather than detailed engineering studies. The city adopted the Solar ABCs as acceptable minimum submittal information, and it provides submittal forms and examples in addition to the *Expedited Permit Process for PV Systems Report* as guidance on its website. To help solar installers understand the revamped process, the city works individually with them so they know what information they need to provide. Installers go to the Building and Safety Department to pull the required electrical permits. Permit and inspection fees cost $61 for single-family residences, while multifamily and commercial installations are charged at $189 and $133 per hour, respectively. Inspections are conducted one day after being requested. Prior to permitting changes, permit fees were not specific to solar and did not have reliable turnaround times.

At the utility scale, it generally takes a solar developer about three to four months to get entitlement [6] from the city, which is extremely fast when compared to the year or more it takes in other jurisdictions. Lancaster has granted entitlements as quickly as two months and the longest has taken five months. During the entitlement process, the city works with developers to learn where their price sensitivities are, whether those sensitivities relate to a power purchase agreement (PPA) or interconnection, and what their timing is.

Given policies like these and other efforts the city has undertaken, it is not surprising that the Los Angeles County Economic Development Corporation awarded the city the Eddy Award for Most Business-Friendly City in Los Angeles County in 2007 (see text box). Lancaster won the award again in 2013 after waiting the required five years to reapply.

## The Power of Relationships

Lancaster is willing to reach out to anyone who has the same goals, whether public or private, to form a relationship to achieve those goals. With Mayor Parris's leadership and with city council, city staff, and residents on board, the city made strategic partnerships for solar a priority. Two examples include the aforementioned collaborations with the Beautiful Earth Group and BYD/KB Home, but other examples abound.

- **Solar Lancaster.** Looking to jump-start solar in Lancaster by boosting solar PV installations, the city decided to partner with SolarCity in July 2010 to create Solar Lancaster, a solar financing program for homeowners and businesses. SolarCity is an all-in-one service provider that works on design, financing, installation, and system monitoring. Through Solar Lancaster, residents and business owners can install solar with no upfront costs. The city marketed Solar Lancaster as a city-sponsored program, which resulted in 130 residential installations in its first year. The partnership also created 1.45 MW of installed solar on five city

properties (city hall, the maintenance yard, the Performing Arts Center, Big 8 softball fields, and the Jethawks' Stadium), saving the city $50,000 per year in electrical costs.[7]

- **Lancaster Power Authority.** Following these successes, the city created the Lancaster Power Authority (LPA), a joint powers authority between the city, Lancaster Housing Authority, and Lancaster Economic Development Agency, to establish a municipal utility specializing in renewable energy as allowed under California's Constitution. The establishment of the LPA was a key factor in moving the city closer to achieving its goal of becoming a net-zero community.

  Once established, LPA assessed the state of energy consumption in the city to identify opportunities to decrease consumption. It saw a unique opportunity to assist the Lancaster and Eastside school districts, which were exploring the possibility of installing solar systems on school facilities to help bring energy costs down. Given the schools' assessment of installing solar, the school districts were unwilling to take on the risks associated with purchasing, owning, and operating solar installations. LPA was able to mitigate these concerns by managing the scheduling and permitting of the solar installations and offering to sell power to the schools through a PPA (an agreement between a provider and a customer to purchase ongoing solar power), prepaid for twenty-five years. LPA provided an innovative financing model (partnered tax-exempt municipal bonds with private tax equity) to further lower the school's PPA price. See text box for additional information on the school solar installations.

### Results of Partnerships between Lancaster Power Authority and School Districts

- Twenty-five facilities throughout the Lancaster and Eastside School Districts
- 7.5 megawatts installed by SolarCity
- Total 32,094 solar panels installed on school parking shade structures
- An estimated $325,000 per year in electrical savings
- More than $8 million in savings over the twenty-five-year project
- Approximately 250 construction jobs

Following the success of the collaboration with the school districts, Lancaster led the establishment of the California Clean Energy Authority (CCEA) in 2012. The main purpose of CCEA is to take what the city has learned through the various partnerships it has created in its effort to become a net zero community and help other smaller cities, school districts, hospital districts, libraries, and utility districts to reach their renewable energy goals.

- High Desert Power Authority. One main challenge to utility-scale solar projects in the region is interconnection (i.e., connecting renewable energy systems, such as utility-scale solar projects, to the electrical grid). Existing connection to the substations and associated infrastructure in Lancaster and the surrounding region is antiquated, so solar developers have to pay substantial fees to upgrade the system. Currently, there is a long line of developers trying to get into two main substations, which are the only points for connection. To help alleviate congestion and make utility-scale solar more financially feasible, the city has proposed a new transmission line and has partnered with the city of Pittsburg, California, to create the High Desert Power Authority, a joint powers authority, to develop it.

## Increasing Momentum with New Solar Requirements

In March 2013, Lancaster became the first city in the nation to pass an ordinance requiring solar PV on new residential construction. The ordinance, which became legally effective January 1, 2014, is the result of the city's effort to amend the residential portion of its zoning code to allow an easier path for alternative energy, especially solar, and other progressive updates. The process by which the city developed the ordinance is also noteworthy. Planning staff and the Planning Commission collaborated with the residential building industry, as well as with organized real estate and building trade associations, to gather input and feedback throughout the process, ensuring that the outcome was practical and supported by key stakeholders.

Several years earlier, in 2009, Lancaster adopted a city-wide general plan and began working on the residential zoning code for the city. It was during the development of this code that the idea to make solar a

"When determining if an ordinance requiring solar is a good fit, first, a city needs to determine what the solar resource is in their community. For example, how many sunny days are there and what is the climate situation. It needs to clearly make economic sense. Second, if your city leadership's main concern is not to offend anyone, then adopting solar requirements is not for you. If leadership is willing to take risks in the name of progress, then you have an excellent chance of replicating the ordinance."

*—Brian Ludicke, planning director, City of Lancaster*

*Source:* Quote from interview with Brian Ludicke on August 29, 2013.

requirement first came up. It became evident that with the mayor and city council's commitment to the net-zero goal, it might be viable to propose that a baseline amount of renewable energy—specifically, solar—be required for new housing.

The Planning Department and Planning Commission started the dialogue about the residential code update in earnest in March 2012. With support from the mayor, the commission sought feedback from builders on the proposed solar requirements. Builders had three main concerns: (1) not every homeowner might want solar, (2) the time frame in which the city would expect the new requirements to go into effect, and (3) the new requirements might give solar a bad name if installations underperformed or failed because of inexperienced or incompetent builders. The city ensured that key members of the building industry were engaged in the process from start to finish, not only to address their concerns and obtain buy-in but also to use their knowledge to help develop the standard. As explained in more detail below, this collaboration resulted in an average for solar PV production over a project rather than a requirement that every new home have solar. In addition, the city gave the building community almost a year from the time the ordinance was enacted to the time it went into effect to prepare for the new requirements. Finally, the city engaged the Greater Antelope Valley Association of Realtors, which supported the idea that a home with solar would sell more quickly than one without.

Over the summer and fall of 2012, the Planning Commission analyzed the potential effects of the solar requirements and other components of the residential code updates. Based on the input received from the building and real estate industry representatives, it concluded that the code updates were flexible enough to not have an adverse impact on the building industry in Lancaster. In February 2013, the commission unanimously made its recommendation to adopt the updates, and the city council approved the new requirements on a 5 – 0 vote in March 2013. In just a year, the city was able to conduct a stakeholder engagement process, analyze the findings, and adopt a landmark ordinance.

The new ordinance requires residential units built within Lancaster on or after January 1, 2014, to provide an average of 1 kW of solar-generated electricity per housing unit (see text box). The requirements were designed to be averages and provide flexibility so that the building community does not feel overburdened. By focusing on average solar generation per project instead of a requirement per unit, the city addressed a primary concern for builders. The city determined a sliding scale of 0.5 kW to 1.5 kW as a baseline average for solar generation capability per unit depending on lot size and location. The city expects to get much higher than the 0.5 kW – 1.5 kW baseline, but when dealing with a shift in policy and thinking, it wanted to start with something palatable. In order for a PV installa-

### Lancaster's New Solar Requirements for New Homes

- New single family homes on 7,000-square-foot or more lots must have a 1.0 kilowatt (kW) to 1.5 kW solar system.
- Homes in rural or nonurban residential zones on lots greater than 20,000 square feet must have a minimum 1.5 kW system.
- Builders' model homes must include the solar system they offer.
- Subdivision builders can aggregate housing requirements like installing one 10 kW solar system, two 5 kW systems or four 2.5 kW systems for a subdivision of ten homes.
- Each phase of housing tract development must meet requirements.
- A rooftop or solar support/shade structure can meet multifamily development requirements.
- Builders can meet the requirements with evidence they bought solar energy credits from another solar-generating development within city limits.

*Source:* Chapter 17.08.305 of the Lancaster Municipal Code.

tion to make economic sense, builders have to install 1.4 kW at a minimum. Although the requirements did not go into effect until January 2014, many new homes being built in Lancaster already included solar; already, new homes in Lancaster are averaging 2.4 kW per system. On new KB Home construction, solar is a standard option, and as of September 2013, KB Home had voluntarily installed solar systems on 310 homes in Lancaster with 745 kW of capacity.

To date, Lancaster has required solar for only new residential construction; this is because it was the residential code that was being rewritten. When it comes time to amend the commercial code, city staff indicated that the city might consider a solar baseline for commercial projects. Interestingly, the city is not requiring solar on residential remodeling projects or add-ons. Instead, it hopes that the benefits of solar are so obvious that homeowners will opt in to solar instead of being forced into it.

For the most part, the reaction to the new solar requirements has been quite positive. Lancaster residents are extremely supportive and the building industry recognizes market demand for solar PV, as reflected in KB Home standard solar option. However, as with most mandates, builders would prefer not to have additional restrictions to abide by. Realtors, though, see this as another way they can market the benefits of living in Lancaster.

## Lessons Learned

Lancaster's attitude toward becoming the solar capital of the world and a net-zero community is not about "*if* we can do it" but "*how quickly* we can get there." By being willing to take on a certain amount of financial and political risk to reach its alternative energy goals, Lancaster is an example of how a small, politically conservative city with huge solar resources can make it happen. Because its efforts are scalable and transferrable to other communities with similar resources, one of Lancaster's goals moving forward is to provide other cities a roadmap on how to successfully meet their renewable energy goals.

- **Elect the right city leaders, who must be 100 percent committed.** For a city to be successful with solar, communities need to choose elected officials who will get changes made. They are the ones who can make city processes (e.g. permitting) easy and can build successful relationships and create business-friendly practices. In addition, city leaders and staff must be committed. If the city is risk averse and not 100 percent committed to making the installation of solar on homes an easy process, it will be difficult to achieve its goals. For example, when the city passed the ordinance requiring solar on new homes, the building industry on principle did not support the mandate; however, this did not sway city leadership from furthering Lancaster's solar goals.
- **Take advantage of natural solar resources.** Lancaster, like many small U.S. cities, does not have a lot of money to create financing or other programs to promote solar. Yet it is on its way to becoming a net-zero community because it has recognized the huge potential of its location and its vast solar resources.
- **Foster relationships and build public-private partnerships.** Lancaster can attribute a substantial amount of its success to the relationships it has formed, including numerous public-private partnerships. Absent a lot of money to put into programs, it becomes almost essential to reach out to anyone with the same goals to make the right connections and leverage resources. Lancaster's

Lancaster City Hall solar array.

### Awards and Recognition

- November 2007 – Eddy Award for Most Business-Friendly City in L.A. County (nominated again in 2013)
- June 2012 - World Energy Global Award
- July 2012 Named Solar Capital of California
- November 2012 - EPA's Smart Growth Achievement Award - Overall Excellence

Mayor Parris at Jack Northrop Elementary School's new solar array.

business-friendly attitude has attracted numerous solar developers. Its ability to get solar PV on homes, schools, city buildings, and businesses at an affordable price is helping the city reach its net-zero goal at a swift pace.

- **Find the formula that is right for you.** If a city has a goal of becoming net zero or dramatically decreasing its energy consumption, Lancaster's strategy should serve as inspiration, not a prescription. Other cities use different approaches toward the same goal. In California, for example, Sebastopol's new solar ordinance is based on watts of power per square foot, while San Francisco is considering ways to address substantial remodels since the city has minimal new construction. Like Lancaster, each of these communities is developing requirements tailored to reflect its specific goals and needs.
- **Emphasize the benefits of solar PV to reflect your constituents' priorities.** Not every elected leader or constituency recognizes climate change as more than an environmental issue, much less something that affects the fundamentals of public safety and the economy. That is not the case with Mayor Parris and his constituents. The mayor recognizes that climate change can result in instabilities in reliable electrical output through the grid with the potential to compromise public safety in times when electricity is out or rationed (brownouts). Further, he and his constituents see private market demand for solar PV as an ideal match for their abundant sunshine. Framing solar PV as a public safety and economic development issue has helped drive solar initiatives in a political climate that might otherwise view solar PV as a purely environmental priority.

## Contacts

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## Endnotes

1. See Lancaster, "Alternative Energy Developments" (last updated June 16, 2014), http://www.cityoflancasterca.org/index.aspx?page=1499; Go 100% Renewable Energy, "Lancaster: Net Zero Power City by 2020," http://www.go100percent.org/cms/index.php?id=92&tx_ttnews%5Btt_news%5D=181&cHash=ce0be9725a292ac373baf02cc04860b1.
2. Data provided by City of Lancaster, September 2013.
3. Data provided by City of Lancaster, September 2013.
4. Quote from presentation given by Mayor Rex Paris at the Pathways to 100% Renewable Energy Conference on April 16, 2013, https://www.youtube.com/watch?v=tmjaSo3ruQs.
5. Quote from presentation given by Mayor Rex Paris at the Pathways to 100% Renewable Energy Conference on April 16, 2013, https://www.youtube.com/watch?v=tmjaSo3ruQs.
6. Defined as the series of predevelopment activities involving the submittal of plans to the city to secure approvals and permits to develop a property for a desired use.
7. Information provided by City of Lancaster, September 2013.

## Author

CIII Associates

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