



ANNUAL REPORT

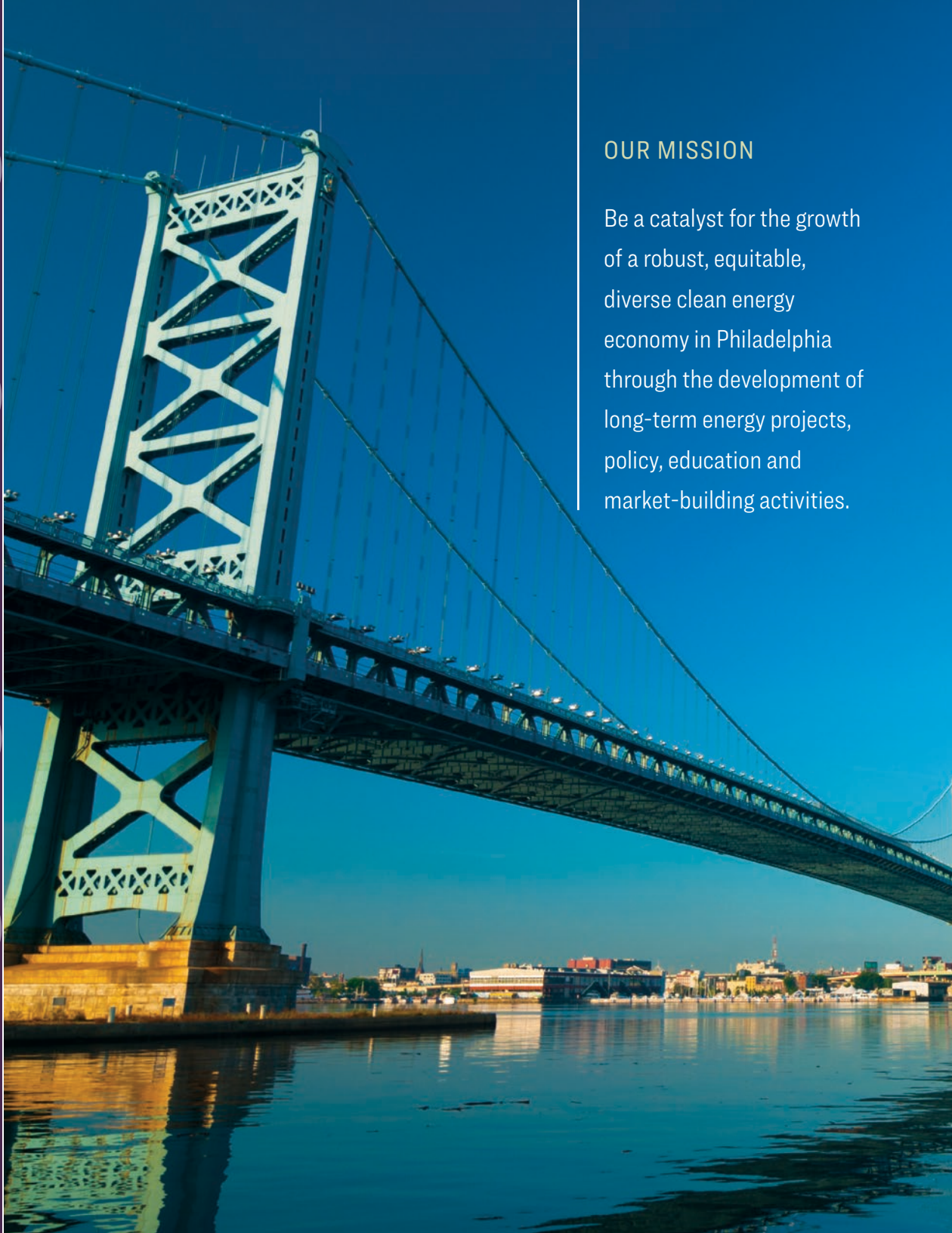
- 2019/20 -



2019-2020

OUR MISSION

Be a catalyst for the growth of a robust, equitable, diverse clean energy economy in Philadelphia through the development of long-term energy projects, policy, education and market-building activities.





OUR VISION

Philadelphia will serve as a model for leveraging clean energy to address the climate crisis, create local jobs, attract global businesses, drive economic development, and improve quality of life for its residents.

OUR VALUES

diversity & equity

transformational impact

strategic partnerships

operational
sustainability &
accountability

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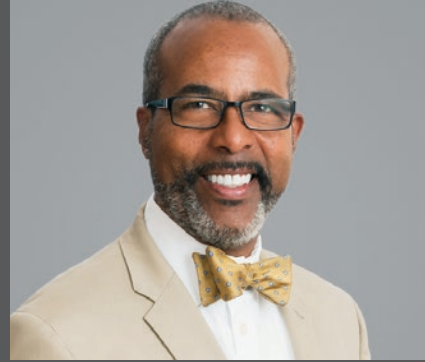


Photo: Blank Rome

In this report, you will read about the innovative programs and projects of the Philadelphia Energy Authority, designed to promote a robust, equitable clean energy economy in Philadelphia. Over the past two years, we have made tremendous progress with the Philadelphia Energy Campaign, charted the path to meet our goals, and have created other initiatives to build on this success.

While I am proud of these accomplishments, I am even more proud of the way the Authority has pursued its goals. As reflected in our updated values statement, the Authority's core values include strategic partnerships, diversity and equity, transformational impact, and organizational sustainability and accountability.

2020 was uniquely and historically challenging for Philadelphia and its residents, and we remain deeply committed to continuing to drive job creation, reduce poverty, and fight climate change through our clean energy work. We are pleased to be able to share this update on the positive work accomplished in 2019 and 2020. With our core values as our compass, I am confident that the Authority will emerge from the COVID-19 crisis positioned even stronger to assist the City in improving the quality of life for its residents.

Christopher A. Lewis
Chair, PEA Board

MESSAGE FROM THE PRESIDENT & CEO

At the Philadelphia Energy Authority, we see how energy affects the lives and well-being of all Philadelphians on a daily basis. This has become all too clear during the COVID-19 crisis, with utility bills rising as folks are in their homes more, the urgent need for appropriate ventilation in homes, businesses and schools, and the clear inequities from one community to the next in housing quality, access and affordability.

As we often say, the Philadelphia Energy Campaign was developed to leverage energy as a tool for impact on some of the most challenging issues facing our city, focused on poverty, job creation, public health and climate change. Our aging housing stock often needs more than weatherization to lower utility costs for our most vulnerable residents. There is a need to address the high cost of entry to access the benefits of solar power and school infrastructure that needs to be updated to support the kinds of healthy, comfortable learning environments that help our students achieve.

Despite all the challenges of this past year, I am deeply proud to share that the Philadelphia Energy Campaign is on track to meet its goals of investing \$1 billion and creating 10,000 jobs by 2026. We are proud to share the progress we've achieved in the first four years of this initiative. Our work started with a set of goals and progressed to feet-on-the-ground action. In these last two years, it has matured to major construction projects, complex new programs launched and successful large-scale initiatives like Solarize Philly, which has put rooftop solar on over 750 homes so far, or our Water and Sewer Service Line Program, which serves 90,000 households and has saved them over \$16 million in repairs.

To date, we've helped invest over \$167 million in clean energy projects, \$81 million of which occurred in 2019 and 2020 despite the negative effects of the pandemic. We've helped create over 1,700 jobs, including over 400 in 2020 during the COVID-19 pandemic.

We have teed up the next set of major projects for 2021 and 2022, including the completion of the first round of procurement for the conversion of all 140,000 of Philadelphia's streetlights to LEDs and the pilots for our new low-income owner-occupied housing restoration program, Built to Last. We've seen significant progress from the School District of Philadelphia on their energy makeovers and graduated our first PowerCorpsPHL cohort of Bright Solar Futures trainees, 92% of whom went on to full-time employment.

This work would not be possible without the support, commitment and leadership of Council President Darrell Clarke, members of City Council, the City's Office of Sustainability, and dozens of partners and supporters in and outside of City government. With their help, we are poised to emerge from the pandemic ready to significantly expand our impact in the next few years and drive forward an equitable and robust clean energy economy in Philadelphia.



Emily Schapira



Photo: Jordan Baumgarten

THE PHILADELPHIA ENERGY CAMPAIGN

4
GOALS

cut energy bills

create jobs

reduce air & water pollution

strengthen communities

5
SECTORS



Our
10-year
objectives

Invest \$1 billion

Create 10,000 jobs



“Launching the Philadelphia Energy Campaign in 2016 put Philadelphia on the cutting edge by approaching clean energy investment as an economic development strategy. Now the Philadelphia Energy Authority is at the forefront of an expanding national conversation. With four years of on-the-ground experience implementing equitable clean energy programs, we are ready to support the federal administration and other stakeholders in their efforts to rapidly scale up this important work.”



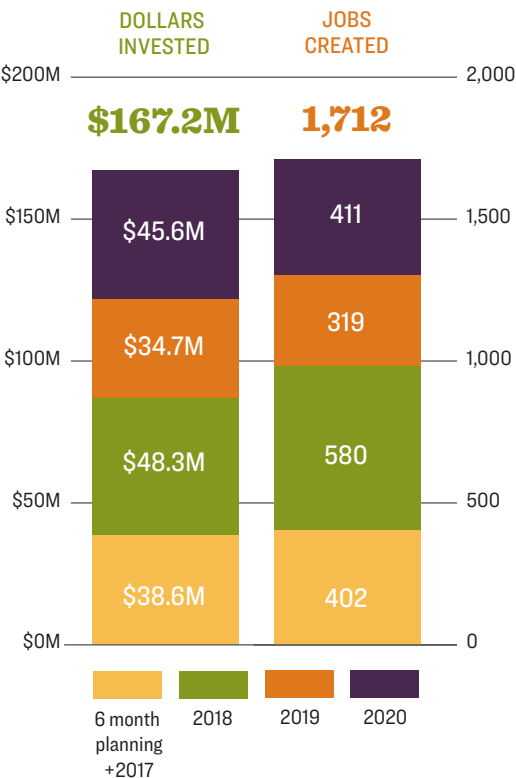
Green Job Growth Continues

PEA prioritizes initiatives that create living-wage, family-supporting employment in Philadelphia’s growing clean energy economy. These are, among others, solar installers, designers and salespeople, equipment suppliers, teachers and trainers, energy auditors, weatherization and solar technicians, energy engineers and building tradespeople.

In 2019 and 2020, PEA tracked jobs from clean energy and energy efficiency projects with:

- Solarize Philly,
- PEA's Water and Sewer Service Line Protection Program,
- School District of Philadelphia,
- City of Philadelphia,
- SEPTA (Philadelphia projects only),
- Philadelphia Housing Authority,
- Commercial and non-profit projects receiving PEA technical assistance, and
- Projects financed through C-PACE.

Other projects highlighted in this report are in various stages of construction and will show job creation at the appropriate stage.



HOW DOES ENERGY EFFICIENCY CREATE JOBS?

When energy efficiency and clean energy projects move forward, jobs are created in three ways:



Direct Jobs

Direct jobs tend to be the skilled trades, sales and project managers, engineers, and designers needed for clean energy projects.



Indirect Jobs

Indirect jobs are created down the supply chain with suppliers and distributors of products, like furnaces or solar panels purchased for projects. These purchases create jobs for companies that supply the energy industry.



Induced Jobs

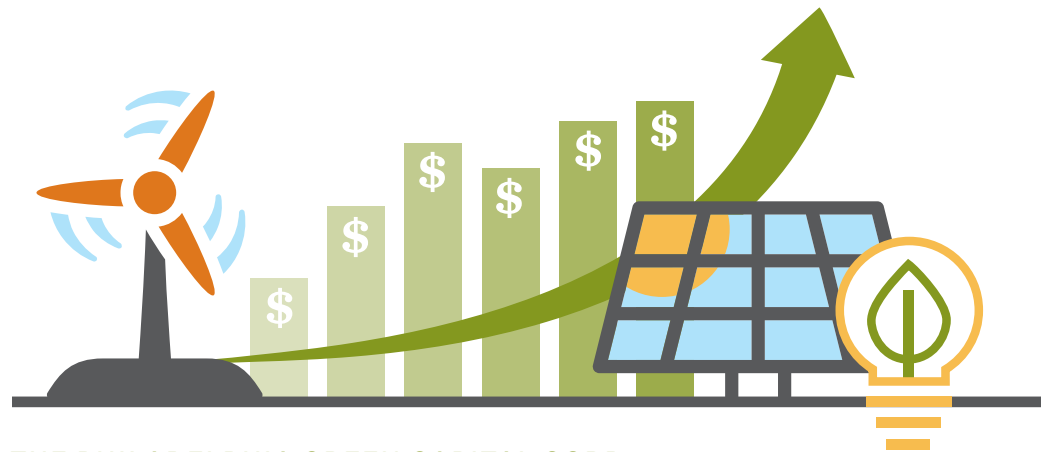
Newly employed workers in these direct and indirect industries spend their earnings on goods and services in the broader economy, creating induced jobs.

The Road to \$1 Billion Invested and 10,000 Jobs Created

After spending the last four years building programs and supporting large and small energy projects, PEA has spurred over \$167 million in clean energy investments and created over 1,700 jobs.

In the next few years, PEA expects a large jump in capital deployed, jobs created, and overall market reach. In fact, PEA has line of sight on \$1 billion in projects through 2026, including over \$700 million in City of Philadelphia and School District of Philadelphia clean energy investments, many of which have been years in the making. During that same timeframe, PEA expects to invest almost \$300 million in projects supported by PEA programs such as Built to Last, C-PACE and Solarize. The projects on the horizon will allow the Philadelphia Energy Campaign to reach its goal of creating 10,000 jobs by 2026.

While PEA's pathway to \$1 billion relies heavily on large institutional projects, PEA will continue to build programs that create jobs and help residents and businesses access clean energy solutions.



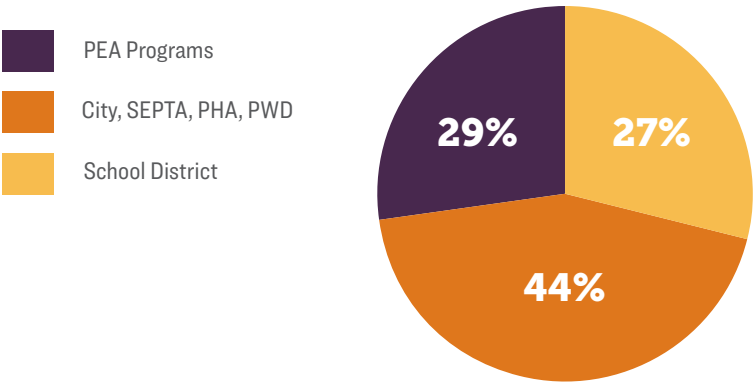
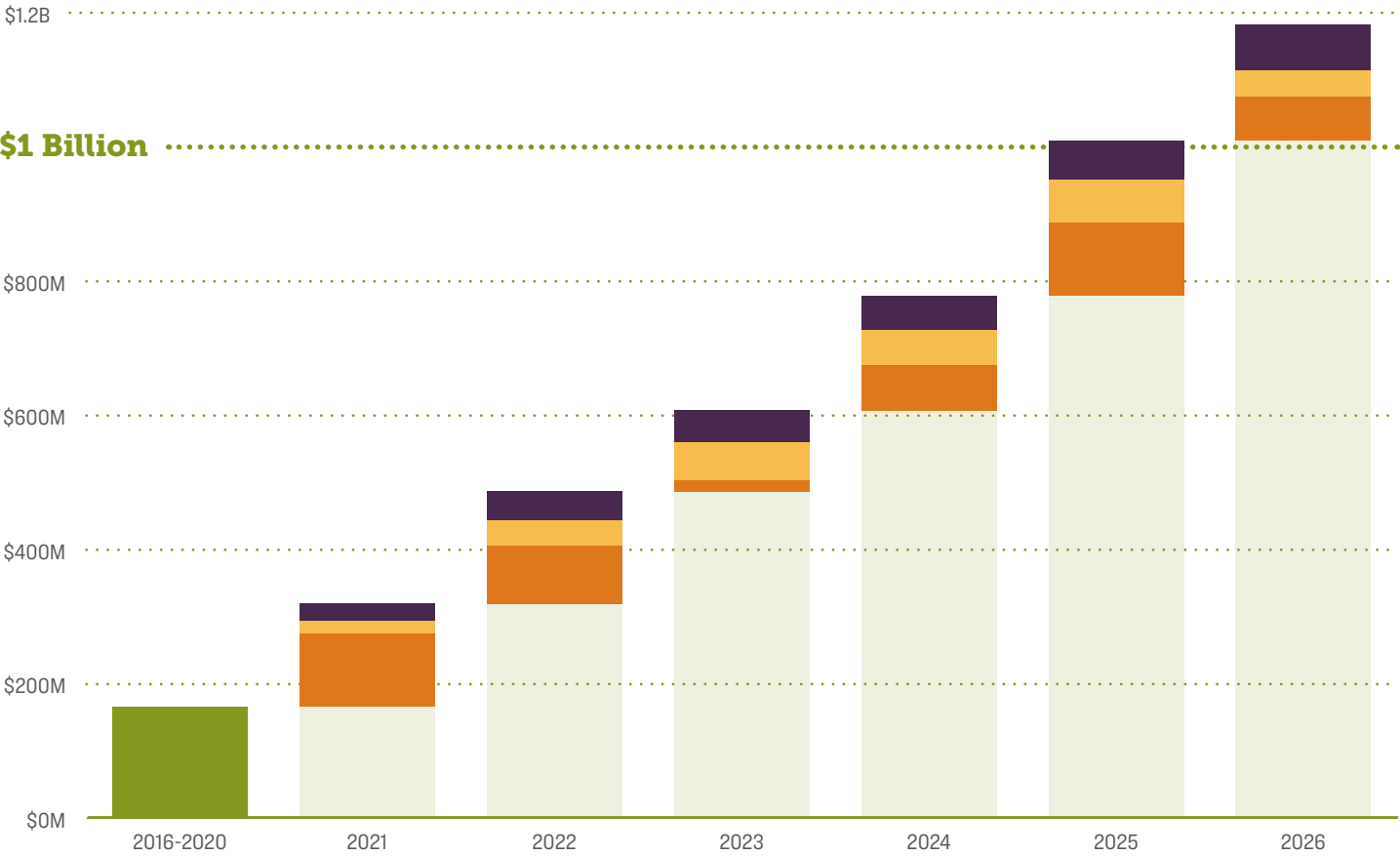
THE PHILADELPHIA GREEN CAPITAL CORP

To scale PEA's current work and meet the goals of the Philadelphia Energy Campaign, PEA recently formed a green bank affiliate, the Philadelphia Green Capital Corp. The organization's mission is to connect projects to capital to drive a robust, equitable, clean energy market in the Philadelphia region, support PEA, and respond to the local challenges of climate change.

The Philadelphia Green Capital Corp. will use proven green bank tools to unlock capital for clean energy projects, including leveraging capital from public, private, and philanthropic sources, offering credit enhancements, using alternative underwriting methods, and facilitating partnerships.

Stay tuned for more details, including an official public launch in Fall 2021!

Total Projected Energy Campaign Investments (2021–2026)



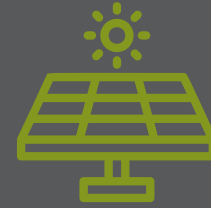
Note: Projections are based on program goals, existing contracts, and City, School District, and other institutional energy plans at this time. Subject to change.

MUNICIPAL

City projects are driven by the Office of Sustainability and enabled by PEA to meet the city's climate goals, including carbon neutrality by 2050 and 100% renewable electricity by 2030.

In 2019, PEA completed contracting for what will be one of the largest municipal power purchase agreements in the nation—70 MW in Adams County—that will power 22% of the City's electricity. PEA also began the procurement process to convert the City's streetlighting to LEDs, which will reduce the municipal carbon footprint by 9%.

In late 2020, construction was completed on the Philadelphia Museum of Art's energy performance contract, which will reduce the Museum's energy use by 23% and greenhouse gas emissions by 2,400 metric tons of CO₂ equivalent annually.



70MW

solar array contracted
on behalf of the City



23%

energy savings at
Philadelphia Museum of Art



140,000+

streetlights to be converted to LED

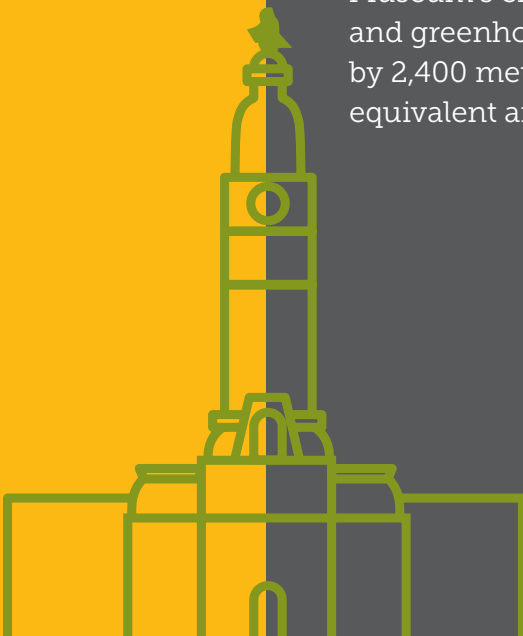




Photo: Jared Piper

"As 438 US Mayors representing 70 million Americans, we will adopt, honor, and uphold the commitments to the goals enshrined in the Paris Agreement. We will intensify efforts to meet each of our cities' current climate goals, push for new action to meet the 1.5 degrees Celsius target, and work together to create a 21st century clean energy economy... The world cannot wait—and neither will we."

—Mayor Jim Kenney

Tackling the Climate Crisis

POWER PURCHASE AGREEMENT FOR SOLAR ENERGY

In 2017, Mayor Jim Kenney joined a global group of mayors in Copenhagen for the C40 Cities Climate Leadership Forum to call for cities to lead in the fight against climate change by remaining in the Paris Climate Accord and driving carbon reduction.

In 2018, PEA received City Council approval to move forward with the City's first major renewable energy purchase. The City selected Community Energy's Adams Solar project, a 70-megawatt solar plant located near Gettysburg, PA. The array will provide 22% of the City's electricity through a 20-year, fixed price power purchase agreement.

In October 2019, PEA completed contracting on behalf of the City. Like most utility-scale solar projects, Adams Solar was sold to a long-term owner-operator—in this case, Engie, one of the largest global operators of large renewable energy projects. PEA and the City initially expected power delivery in 2020, but it was delayed due to the COVID-19 pandemic.

Though the project is not in Philadelphia, PEA and the City required an Economic Opportunity Plan to ensure diverse contractor participation and to ensure Philadelphia-based contractors could compete for the work. The City's Office of Sustainability worked with the Office of Economic Opportunity to negotiate an appropriate prevailing wage that falls between those of Adams County and Philadelphia County.

PEA Board Vice Chair E. Mitchell Swann chairs the project's EOP Oversight Committee, formed in 2020, and Community Energy, Talson Group and Engie hosted a Philadelphia forum to introduce diverse contractors to the project. Once contractors are selected, they will also host a job fair to bolster workforce diversity.

PEA signed an additional agreement with Community Energy (and the subsequent owner) to ensure on-the-job training opportunities for Philadelphia-based solar trainees and that every effort will be made to identify ways to engage the Philadelphia workforce. Fifteen students will train in the field as the solar array is installed, in addition to those who are employed full time on this project. Construction will take twelve months.

City Project Lights the Way

LED STREETLIGHTING PROJECT



According to the City's Municipal Energy Master Plan, "converting the City's more than 100,000 streetlights to LED lights remains the single largest carbon-reducing energy efficiency project that City government can complete." By the Office of Sustainability's (OOS) calculations, the conversion will represent a roughly 9% reduction in our municipal carbon footprint, or over 13,000 metric tons of CO₂e (based on 2014 electrical grid composition).

Philadelphia's streets are currently lit by inefficient, high-pressure sodium lights that cast a yellowish hue and are unable to target light where it's needed. Lack of adequate lighting often results in public safety risks, higher traffic accidents, and other negative community consequences. Energy-efficient LED streetlighting is just one of many needed steps to curb gun violence in Philadelphia, and its rollout will focus on providing equitable, appropriate lighting across all neighborhoods.

Evidence shows that LED streetlights can improve driver visibility and reduce traffic accidents and deaths, supporting the City's Vision Zero efforts. Further, LED streetlight conversions are the perfect opportunity to incorporate smart cities technology, which is being evaluated as part of the streetlighting design process, supporting the SmartCityPHL Roadmap. Over the last decade, the Streets Department has installed pilot LED light projects on commercial corridors and has seen an anecdotal reduction in litter and an increase in revenue and foot traffic to local businesses.

After more than 5 years of development and planning, PEA released a Request for Qualifications on behalf of the City for streetlighting implementation. This work was led by Adam Agalloco in OOS's Energy Office with support from Richard Montenez and Kristin Del Rossi in the Streets Department, the Office of Innovation and Technology's SmartCityPHL initiative and PEA.

The RFQ, issued in December 2019 by PEA on behalf of the City, was the first step in the procurement process and specified upgrading the City's existing 140,000 street and alleyway lights with high efficiency LEDs and controls. In 2020, PEA led the RFQ evaluation process, selecting four firms as finalists: Ameresco, AECOM, Johnson Controls, and The Efficiency Network. In 2021, PEA will release a Request for Proposal (RFP), and with representatives from Streets, OOS, the Office of Innovation and Technology, Finance, and the Office of Economic Opportunity, PEA will select a service provider to begin project development.

Energy Projects Support City's Climate Goals

ANNUAL BENEFITS OF ART MUSEUM ENERGY UPGRADES:

Reduce emissions by
2,400
MT of CO₂e

Reduce electricity use by
4.8M
kWh

Lower steam use by
16,000
MMBTU

Recycle
10M
Gallons of Water



Check out a short video on the project at: <https://on.jci.com/3vMqEiG>

ART MUSEUM GUARANTEED ENERGY SAVINGS PROJECT

The public-private partnership of the Philadelphia Museum of Art, the City of Philadelphia's Energy Office, the Philadelphia Energy Authority and Johnson Controls completed its guaranteed energy savings project in 2020. The performance contract covered the identification and implementation of energy system upgrades and improvements that will significantly reduce the operational cost of the Art Museum complex and protect PMA's valuable artwork collections. PEA holds the 20-year contract on behalf of the City and monitors contract performance.

At a project cost of \$11,300,000, the upgrades and improvements will return a guaranteed annual cost savings of \$750,000 for the one million square foot facility, one of the five largest energy users in the City. Energy conservation measures included the installation of 11,000 high efficiency LED lights in the Main Building, the Rodin Museum and the Perelman Building, upgrades to the heating system, the installation of a variable flow chilled water distribution system as well as a condensate water reuse system, the conversion of 200 pneumatic steam valves to DDC valves, the replacement of 800 steam traps, upgrades to the building automation system and air handling units, and improvements to water fixtures.

These conservation measures will result in a 28% electricity usage reduction, a 21% steam usage reduction, and an 8% water usage reduction as well as an emissions reduction of 2,400 metric tons of CO₂ equivalent annually. The project created 191 green jobs and included 42% MWDBE project participation.

This project set a global standard for cultural institutions to make significant investments in energy reduction and "behind the wall" infrastructure. PMA and their vendor, Johnson Controls, continue to field inquiries and interest in the project from all over the world.

OTHER MUNICIPAL ENERGY EFFICIENCY INITIATIVES

Reducing energy consumption is key to meeting Philadelphia's climate goals, including achieving carbon neutrality by 2050. The Office of Sustainability's (OOS) Energy Office, in partnership with the Office of Innovation and Technology, expanded building automation systems (BAS) in City buildings and completed procurement to centrally connect all BASs to better manage energy efficiency and occupant comfort.

Through the Greenworks Sustainability Fund and other capital and Rebuild projects, OOS began or completed energy-efficient retrofits at Greenland Nursery (Parks & Recreation), Curran Fromhold Correctional Facility (one of the City's top 10 energy users), Roxborough and Central Libraries, and Police, Fleet and Department of Public Property facilities.

Retrofits included interior and exterior lighting, HVAC upgrades and building controls.

For further details, see the 2020 Update to the Municipal Energy Master Plan at <https://www.phila.gov/documents/municipal-energy-master-plan/>.

SEPTA ADDS SOLAR AND BEGINS HQ RETROFIT

In 2019, SEPTA completed contracting and construction on a solar power purchase agreement for roof-mounted solar PV at four SEPTA maintenance facilities across Philadelphia. These sites include the following maintenance facilities:

- 2nd and Wyoming (Bus Maintenance, Print & Sign Shop)
- Fern Rock (Rail Shop for Broad Street Line)
- Callowhill (Bus Maintenance)
- Roberts (Rail Shop for Regional Railcars)

The budget-neutral project, which incorporates 3.1 MW of solar, spans 15 acres of rooftops and provides just under 1% of SEPTA's electricity.

SEPTA also ran a public bid for a large off-site renewable energy project, which was contracted in 2020 with Lightsource BP for 35 MW in Franklin County, PA. SEPTA joins the City, Penn State University, University of Pennsylvania and other major institutional players in signing long-term clean energy project agreements that can help hedge risk for electricity prices over time and support climate mitigation efforts in Philadelphia and beyond.

In 2019, SEPTA also contracted and began construction on a major energy efficiency project at their headquarters at 1234 Market St. in Philadelphia. The almost \$13 million renovation is structured as an energy performance contract with Constellation as the implementation partner.

The renovation includes LED lighting and controls, building envelope improvements, major HVAC renovations including motors, drives, air handlers, destratification fans and cooling tower refurbishment, water conservation, improved electric submetering to better track use and promote savings, and electric window shades to reduce uneven heat transfer on one side of the building.

PEA tracks clean energy projects that SEPTA completes inside of Philadelphia city limits, since they contribute to job creation, carbon reduction and building a robust clean energy economy here. Credit for these significant projects go to SEPTA's innovation and sustainability teams.

SCHOOLS



In 2019, PEA's partnerships with public schools and workforce development agencies established Philadelphia as a leader in solar job training. In the school buildings themselves, the School District of Philadelphia's continued commitment to deep energy retrofits proved that significant energy savings, improved building performance and learning environments, and climate resilience can be achieved through guaranteed energy savings projects.

create
jobs



21

internships in
2019 & 2020

cut energy
bills



38%

average energy
savings across
first 3 schools

51%

average energy
savings at Strawberry
Mansion High School

strengthen
communities



88

young people trained
for solar jobs
(2017-2020)



PA's First Solar Energy
Career and Technical
Education program
approved

Schools Get High Marks on Renovations



Photo: Jared Piper

ENERGY PERFORMANCE CONTRACTING: SCHOOL DISTRICT OF PHILADELPHIA

GESA Pilot

PEA provided technical assistance to the School District of Philadelphia (SDP) to plan its first energy performance contracting pilot, termed GESA Pilot (for the Guaranteed Energy Savings Act). The \$23 million project, approved in Q4 2018 and awarded to NORESO, yielded an average of 38% energy savings across three high schools: Walter B. Saul Agricultural School, Strawberry Mansion High School, and Northeast High School.

The energy efficiency upgrades implemented at these schools included installation of new boilers, windows, daylight-controlled lighting, and ventilation units to circulate fresh air into the classrooms, especially important in light of the COVID-19 pandemic. Energy efficiency renovations will save the district an estimated \$375,000 a year in energy costs.

Green Bond - GESA 1, Phase 1 Schools

In October 2019, the SDP Board of Education approved a \$30 million Green Bond to fund environmentally beneficial capital projects that reduce energy use in selected schools across the district.

Construction is ongoing on the first non-pilot phase of energy makeovers, which includes three schools: Conwell MS, Gompers ES and Lincoln HS. GESA allows the School District to contract for all needed energy conservation and related capital measures with a single vendor, Johnson Controls, Inc. (JCI), who was selected via a public procurement process for up to 20 schools. The twelve selected schools will be addressed in six phases. JCI must provide an energy performance guarantee, which ensures that actual energy savings match what was projected during project development.

As with the three pilot schools, buildings will receive significant HVAC, lighting, and building envelope and other upgrades. HVAC improvements include air conditioning installation at Conwell MS and Gompers ES and updated ventilation to ensure needed airflow for health and safety. Construction is expected to be completed in 2021. This phase reflects a \$25.9 million investment and 24% net utility cost savings.

PEA provided support through the procurement process, serving an advisory role on the selection committee, and continues to provide technical assistance and other support on these and other energy-related projects.



Photo: Bellefonte Area School District, 2010. Provided by Aaron Barto.

SOLAR SCHOOLS STUDY

Since the launch of the Philadelphia Energy Campaign, PEA has been interested in installing solar on school rooftops to provide long-term cost savings, create learning opportunities for students, and support the SDP's GreenFutures climate goals.

Building on a report PEA released in 2016 that found the cost of electricity from rooftop solar was at parity with the price the SDP pays for its power, PEA, in partnership with PECO, commissioned an updated solar schools study in 2019. PEA focused the study on four sites that the SDP capital team recommended based on school facility conditions:

- Andrew Hamilton
(5640 Spruce Street, 19139)
- Henry A. Brown
(1946 East Sergeant Street, 19125)
- Mayfair Elementary
(3001 Princeton Avenue, 19149)
- Murrell Dobbins Career &
Technical Education High School
(2150 West Lehigh Avenue, 19132)

Two of the region's top subject matter experts, Ron Celentano of Celentano Energy Services and Roger Clark of Roger Clark Consulting, conducted the study, funded by PECO. Because the cost of solar had continued to decline, this report found that electricity generated by rooftop solar was actually cheaper than the price the School District was paying for electricity.

The researchers determined that the proposed 4-school pilot would save the district over \$60,000/year in electricity costs.

The study proposed that the solar installations be funded through a power purchase agreement (PPA). Under this model, solar developers would be selected through an RFP process to design, finance, construct, commission, own, and operate the solar installations. The SDP would be responsible for paying for the delivered electricity at the rate negotiated in the PPA. This model allows for monetization of the federal solar Investment Tax Credit.

The assessment of the four schools' usage patterns showed 1,218,234 kilowatt-hours could be generated from solar in the first year of operations, which would offset approximately 45% of the electricity consumption for those schools.

A group of young people and an older man are standing in front of a brick wall. The young people are dressed in casual clothing, including t-shirts and jeans. One young man is wearing a black t-shirt with a graphic that says "LEVI STRAUSS & CO. ORIGINAL TWEED QUALITY CLOTHING". Another young man is wearing a grey t-shirt. A young woman is wearing a red headscarf and a red top. The older man is wearing a white t-shirt and glasses. They are all looking towards the right side of the frame. The brick wall is made of red bricks with white mortar. The lighting is bright, suggesting it is daytime.

"Bright Solar Futures has been recognized as a national model for scaling up solar training, by unlocking public funding for a vocational program that can sustain the program into the future. Solar installer is one of the fastest growing jobs in the U.S., and we are committed to preparing Philadelphia's young people for these new positions."

— Laura Rigell,
PEA Director of
Development, Policy,
and Workforce
Initiatives

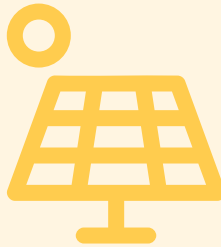
Unlocking the Solar Workforce for Young People of Color

BRIGHT SOLAR FUTURES FOR YOUNG PHILADELPHIANS

In 2019, PEA kicked off Bright Solar Futures, an intensive solar training program for young people, with a focus on people of color and those who are un- or under-employed. Through Bright Solar Futures, PEA launched Pennsylvania's first high school vocational solar program and a parallel Solar Fellowship program for Opportunity Youth. The Bright Solar Futures program prepares Pennsylvania's young people for solar jobs, diversifying the solar industry while meeting employer demand for a highly skilled workforce.

Bright Solar Futures partners include:

- The School District of Philadelphia
- Solar States
- The Energy Coordinating Agency
- The Philadelphia Education Fund
- PowerCorpsPHL
- YouthBuild Philly
- F.A.V.O.R.
- Actus Policy Research
- PECO
- The Fund for the School District



WHY SOLAR?

Solar installer is currently listed as a High Priority Occupation for Philadelphia County due to high employer demand for solar workers. Additionally, solar installer jobs start at a living wage, do not require a college degree, and provide valuable on-ramps to apprenticeships in the building trades and utilities, solar design and sales, entrepreneurship, higher education and more.

SOLAR FELLOWSHIP FOR OPPORTUNITY YOUTH

In 2020, PEA launched the Bright Solar Futures Opportunity Youth Fellowship in partnership with PowerCorpsPHL. The program provides a paid solar training fellowship for Opportunity Youth (young adults ages 18-30 who are not in school or are un- or under-employed). The program includes 17 weeks (680 hours/40 hours per week) of hands-on, highly technical training in solar installation and design and electrical basics, taught by industry professionals from Solar States and the Energy Coordinating Agency.

The training prepares participants to sit for the NABCEP PV Installation Professional Certification Exam. Completion of the Bright Solar Futures training unlocks 10-week paid fellowships with solar employers and access to job placement with an average starting wage of \$16/hour.

PENNSYLVANIA’S FIRST HIGH SCHOOL SOLAR PROGRAM



Photo: Lisa Shulock

In 2019, PEA laid the groundwork for the School District of Philadelphia’s (SDP) new Career and Technical Education (CTE) program in Solar Energy. PEA convened an Occupational Advisory Committee of industry and education experts to advise on curriculum development for the program. The PA Department of Education then issued approval for the proposed curriculum, paving the way for the SDP to access federal Perkins funds to hire a solar teacher and launch the program in fall of 2020.

The program earned local and national media coverage thanks to press events coordinated by PEA that featured Mayor Kenney, Superintendent Hite, members of City Council, and PECO executives.

In 2019, PEA provided introductory solar training to two cohorts of high school students to pilot elements of the new curriculum and to continue making solar training available while the CTE program was in development. PEA offered a 6-week paid summer class, partnering with Solar States, the Energy Coordinating Agency (ECA), F.A.V.O.R., and Philadelphia Youth Network’s WorkReady program, as was done for the 2017 and 2018 Find Your Power programs.

PEA placed 10 successful graduates from the introductory classes into paid internships in the summer and fall of 2019. Students participated in paid work experiences with employers in the clean energy sector, applying skills they learned in the program and gaining valuable work experience.

PEA offered another introductory class as an elective course for the School District’s CTE students during the 2019-2020 school year. Participating students traveled off-site one day per week to take solar classes at ECA, starting in the fall of 2019 and continuing into 2020. This elective course was suspended in spring 2020 due to COVID-19, and PEA invited students to complete the curriculum through another WorkReady program in summer 2020.

In fall 2020, PEA supported the School District to launch the new Solar Energy CTE Program at Frankford High School. The curriculum includes 1,080 hours of content delivered between 10th and 12th grade, making it the most advanced solar training of its kind in the nation. Students will graduate with field experience, internships, and industry certifications and will receive job placement support.

MILESTONES

JULY 2019

Convened Occupational Advisory Committee (OAC)

JULY-AUGUST 2019

19 students enrolled in the summer classes, returning students placed into internships

DECEMBER 2019

Received approval from PA Dept. of Education for new Solar Energy CTE Program

JANUARY 2020

OPPORTUNITY YOUTH FELLOWSHIP
PEA and PowerCorpsPHL kicked off the first Bright Solar Futures Fellowship



“Most quality career pathways in this city, and in this country, are more accessible for young people who come from great privilege than for young people who come from great promise. Bright Solar Futures is about connecting young Philadelphians of great promise to jobs in solar.”

— Scott Emerick, Executive Director, YouthBuild Philly

NEW SOLAR TRAINING LAB AT FRANKFORD HIGH

PEA is proud to support the School District in building a state-of-the-art solar training lab at Frankford High School, which will be home to the Solar Energy CTE Program when students return to in-person learning. The lab will include a mock roof for solar installation practice, inverters, a battery, and other electrical equipment for students to practice skills that they can apply in the field. The lab is in development with planned completion in 2021.

The solar lab is made possible by support from the School District’s Capital, Facilities, and CTE teams, along with lead sponsorship by PECO at \$150,000. Community Energy and the National Electrical Contractors Association (NECA) have each contributed \$10,000 toward the lab. In-kind equipment and professional services contributions cumulatively valued at \$58,400 have been made or pledged by the following companies:

- BFW Group
- CED Greentech
- Cooper Electric
- Milwaukee Tools
- Open Sky
- Palmetto
- Practical Energy Solutions
- Re:Vision Architecture
- Solar States
- Spotts, Stevens and McCoy
- Suncycle

MARCH 2020

Introductory high school program suspended due to COVID-19

Bright Solar Futures Fellowship switched to online learning

JUNE 2020

New Solar Energy Teacher hired at Frankford High School, with support from PEA and OAC members

AUGUST 2020

92% of Fellowship graduates placed into jobs

SEPTEMBER 2020

New Solar Energy CTE Program launched at Frankford High School

AFFORDABLE HOUSING



PEA uses energy projects and programs to stabilize utility costs, improve health and comfort, and ensure all Philadelphians can access clean, affordable energy.

In 2020, PEA launched the Solar Savings Grant Program, Philadelphia's first solar program for low- and moderate-income homeowners, which offers rooftop solar installations at no upfront cost and savings starting in Year 1. PEA also completed the roadmap for its new Built to Last program for single-family, low-income homeowners, which layers, coordinates and supplements home repair programs to restore safe, healthy, and affordable homes.

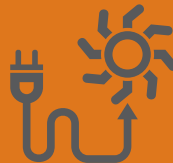
create
jobs



98

jobs through
Solarize Philly's
four phases

cut energy
bills



1.66MW

new contracted rooftop
solar capacity

strengthen
communities



90,068

households enrolled
in Water Sewer
Protection program



346

new contracts through
Solarize Philly and the Solar
Savings Grant Program



\$16.1M

saved in homeowner
water & sewer repairs



Energizing Philly

Photo: Solar States

SOLARIZE PHILLY MAKES GOING SOLAR EASIER FOR PHILADELPHIANS

Launched by PEA in 2017, Solarize Philly is a citywide program to help Philadelphians go solar. Solarize Philly is innovating on the success of the traditional solarize model by expanding job training programs and offering a subsidized option for low- and moderate-income households, all while delivering competitive pricing and consumer protections for all consumers.

The program uses a group buying model to make going solar as easy and affordable as possible. After selecting reputable, local companies to perform installations, PEA vets and approves the solar equipment and negotiates discounted pricing for equipment and labor. PEA reviews and approves consumer contract terms and conditions and provides permitting and interconnection support, installer oversight and quality control, and ongoing customer support. These aspects of consumer protection are critical to the growth of Philadelphia's solar market.

Solarize Philly 2019

Between July and October 2019, Solarize Philly added 2076 sign ups, with 294 new contracts signed.

In 2019, PEA engaged in various outreach activities to spread the word about Solarize Philly and to educate the public about the benefits of going solar. The Solarize Philly team participated in community meetings and tabled at events across the city. PEA also organized “lunch & learn” sessions on solar for employees from organizations including PECO, SEPTA, the Navy Yard, PIDC, University of Pennsylvania and the City.

PEA celebrated its first ever Philadelphia Solar Week in 2019. Highlights included Mayor Kenney signing the Solar Rebate into law, graduation of Bright Solar Futures trainees, a tour of solar homes across the city and an ice cream crawl featuring exclusive Solarize Philly flavors at local shops. PEA proudly hung a 3-story banner on City Hall encouraging people to Go Solar Now.

Solarize Philly 2020

Between April and October 2020, Solarize Philly added 573 sign ups, with 52 new contracts signed, despite a major contraction in construction and solar nationwide during COVID-19.

In 2020, due to COVID-19, PEA switched to virtual outreach platforms and social media to share how going solar can lower electric bills for Philadelphians and create more living wage jobs. PEA organized and participated in various online events during the second annual Philadelphia Solar Week, including a webinar series featuring Council President Darrell Clarke, Office of Sustainability Director Christine Knapp, Solar States Founder Micah Gold-Markel, Director of Congressional Affairs for SEIA, Shaun Garrison, Community Energy Principal CEO Brent Alderfer, and PECO Vice President Nicole Levine.

COVID-19 was tough on the solar industry, but PEA is seeing a rapid bounce back for those companies that made it through.



Photo: Solar States

SOLAR SAVINGS GRANT PROGRAM

It took two years for PEA to develop a viable financial model and the partnerships needed to support low- and moderate-income (LMI) households to go solar through Solarize Philly. In 2020, PEA finally was able to launch the Solar Savings Grant Program (previously referred to as the Special Financing Pilot), which provides rooftop solar installations at no upfront cost and with utility bill savings starting in Year 1. PEA screened participant eligibility based on income and the applicant's electricity bill payment history over the prior 12 months rather than underwriting based on FICO score or debt-to-income ratios to make the program more accessible and in line with national data.

The Program subsidizes about half of the project and provides participants with low-cost financing for the remaining cost. The projects are subsidized with Solarize Philly program fee revenue, with a loan loss reserve and operations and maintenance (O&M) costs funded by a \$200,000 grant from the PA Housing Finance Agency (PHFA). Participating households receive bi-annual inspections, cleaning and minor maintenance at no cost, and support if a system must be removed for roof repairs.

The Solar Savings Grant Program was made possible with support from Solarize Philly, the Pennsylvania Housing Finance Agency, Solar States, Centennial Parkside Community Development Corporation, the William Penn Foundation, Spark Therapeutics, and the National Energy Improvement Fund (NEIF). This creative combination of funding sources allowed PEA to design a very attractive offering for participants. As of December 2020, 29 SSGP contracts were signed, and PEA continues to fill up to 50 spots in the current cohort through early 2021.

Partnering to Help Homeowners

WATER SEWER SERVICE LINE PROTECTION PROGRAM

In Philadelphia, homeowners are responsible for the water and sewer service lines that run underground from their homes to the PWD water main in the street. With the oldest water infrastructure in the nation, every Philadelphian knows someone who has had a service line failure, and these unplanned repairs and replacements can cost homeowners thousands of dollars. To help homeowners manage water and sewer line repair expenses and to help the Water Department reduce wasted energy costs associated with leaky service lines, PEA, with encouragement from Councilmember Derek Green, launched the Water and Sewer Service Line Protection Program in late 2018.

Through a public procurement process, PEA selected American Water Resources as the vendor. AWR offers pricing to consumers that is significantly lower than both local competitors and other markets across the U.S., and they were willing to negotiate terms and conditions that are extremely favorable to Philly homeowners.

Water and Sewer service lines are typically not covered by homeowners' insurance, and even with a rider, homeowners must still find their own plumbers and pay deductibles. In PEA's program, homeowners pay less than \$10 per month with no deductibles, service fees or denials for issues resulting from normal wear and tear, even if the home is 100 years old. The program covers clogs, repairs, and replacements and fully replaces all lead lines identified in need of repair.

The program was extremely well-received by Philadelphians, with 90,068 customers enrolled by the end of 2020. To market the program, AWR sent mailers to all eligible homes, and with the endorsement and support of all ten of Philadelphia's District City Councilmembers, homeowners received information from a trusted source and often reached out to Council offices or PEA to learn more. PEA also conducted outreach through briefings, town halls, info sessions, community meetings and lunch and learns for large employers.



As with all its programs, PEA charges a "program fee" to build revenue to support other programming. Funding from this program helped PEA weather City budget cuts resulting from COVID-19 and allowed the Authority to seamlessly continue driving clean energy job creation and public benefits.



"The Philadelphia Energy Authority's work to center communities of color and low-income communities does not go unnoticed. Whether by retrofitting a public school building, training young people for jobs as solar installers, or supporting low-income households to save money through a rooftop solar installation, this work is flipping the script on who will benefit from the city's transition to clean energy. As we start to scale up these programs at the pace required by the climate crisis, we can have a positive impact on the lives of thousands of our city's most vulnerable residents."

—Councilmember Katherine Gilmore Richardson

THE H2O (HELP TO OTHERS) FUND

As part of its contract with American Water Resources, PEA established the H2O Fund, which provides service line replacements to low-income households that are unable to take advantage of existing city programs. These households may not have clear title to a handed-down property or may be in a foreclosure prevention program, and in some cases, have lived without functioning water or sewer service for years.

Applicants must meet eligibility guidelines, including monthly income not exceeding 250% of the Federal Poverty Level. Intake is conducted through Community Legal Services' Energy Unit.

AWR's initial contract term was two years, and as part of renewal negotiations in 2020, PEA negotiated an increased contribution for the H2O Fund, which now receives \$100,000 annually.

Additionally, encouraged by members of City Council and constituents, PEA and AWR introduced five new home protection programs to Philadelphia homeowners: interior plumbing clog protection, water heater repair or replacement coverage, interior electric line protection, interior gas line protection and surge damage protection. In each scenario, PEA reviewed and negotiated the terms and conditions to ensure pricing is competitive, and benefits are clear and easy to utilize.

Energy Performance Improvement for Long-Term Housing Affordability

BUILT TO LAST

In 2019, after significant stakeholder outreach and discussion, PEA began to design a program to integrate, layer and coordinate low-income home repair services across federal, state, local, non-profit, utility and other programs. Rather than provide a single service, the initiative makes it possible to provide all of the services a home needs to be restored to safe, healthy and affordable conditions.

PEA's goal is to keep people in their homes and communities, preserve existing naturally-affordable housing, reduce program denials, and make it easier for homeowners to access these benefits.

During the fourth quarter of 2019, PEA worked to obtain buy-in from partner programs or departments that have a common goal of assisting low-income homeowners to establish an integrated platform for program providers to deploy their services collaboratively. PEA formed a coalition of 21 organizations.

In 2020, PEA worked with the coalition to refine the Built to Last program model for coordinated service delivery to low-income homeowners. This began with a workshop hosted with the Independence Blue Cross Center for Innovation in early 2020. PEA then worked with Capital Access, Inc. to develop a program roadmap, which set PEA up to launch a 50-home pilot in 2021.

PEA received a \$140,000 grant from the William Penn Foundation to support its work with Benefits Data Trust (BDT), a local Philadelphia non-profit that helps connect families with federal, state, and local benefits. PEA will work with BDT to expand their benefits screening tools to include home repair programs leveraged as part of Built to Last.

Analysis conducted on existing programs suggests that nearly 75% of the home repairs for the target population could be deployed by an integrated service delivery model. The remaining 25% of the home repair fees could be covered by grants and microloans. Funding alternatives will be examined and refined during the pilots, which are slated for the spring and fall of 2021.

Built to Last uses energy and weatherization to support long-term affordability, which includes the evaluation of electrification measures. These measures include conversion from oil or other inefficient heating systems to electric heat pumps, which provide both heating and cooling, a feature becoming even more critical as climate change drives hotter summers in Philadelphia. Every Built to Last home will also receive a solar evaluation, and where appropriate, installation of rooftop solar to reduce or eliminate electricity costs.

THE BUILT TO LAST PROGRAM



Benefits Screening and Application Assistance

Single application screens eligibility for all benefits and services and allows for inter-agency data sharing while protecting personal info.



Holistic Property Assessment

Identifies all home needs and matches required home improvements with applicable funding sources.



Cross-Program Construction Management

Streamlines delivery of multiple programs and beings in external funding to shorten timeline and fill any gaps.

CITY REPAIR PROGRAM ENERGY STANDARDS

Photo: Clarifi



PEA worked with both the Restore Repair Renew (RRR) loan program overseen by the Philadelphia Redevelopment Authority (PRA) and the Basic Systems Repair (BSR) program managed by the Philadelphia Housing Development Corporation (PHDC) to review ways to incorporate more energy conservation measures into their programs.

Because RRR participants pay for their home repairs with a low-interest loan, they make the final decisions on the work being completed in their homes beyond what is required to meet minimum quality standards. Therefore, it was critical to find ways to educate homeowners on opportunities identified by RRR inspectors that could lower energy use while improving the health and safety of their home.

Working with RRR program intermediaries, Clarifi and Philadelphia Council for Community Advancement, PEA reviewed the process for conducting preliminary home needs assessments, which are used to verify that participant homes meet minimum quality standards and to help the homeowner identify other repairs that can be included in the program scope of work.

PEA advised Clarifi and PCCA to expand their home assessment to include the minimum home quality standards, additional energy consumption watch areas, and frequently reported health and safety risk areas.

To help the RRR inspectors use the expanded checklists effectively, PEA arranged a two-day class on Building Science Fundamentals, conducted at the Energy Coordinating Agency in 2020. The class helped PRA intermediaries identify energy efficiency opportunities and health hazards in the home while they performed the initial home assessment to develop a minimum scope of work. PEA also produced a guide with recommendations for standard improvements that lead to big benefits.

For the BSR program, PEA teamed up with PHDC to establish Energy Conservation Standards.

The new standards put into place in 2019 included:



New windows must have a thermal resistivity rating of at least R-5; new doors must be exterior-rated.



Replacements for furnaces and boilers must be high efficiency whenever feasible.



Plumbing fixtures must carry the WaterSense label, a U.S. EPA product design standard that uses less water.



Attic and crawl space insulation should be paired with new roof installation when BSRP funding is available. Insulating a home's roof can reduce energy costs up to 20%. PHDC plans to add attic insulation to at least 25 homes annually with the new standard.

Making Multifamily Housing More Efficient

MULTIFAMILY HOUSING PILOT

The Multifamily Affordable Housing Pilot aimed to deliver deep energy savings of over 30% to multifamily properties serving low-income tenants. The program was developed by PEA in partnership with a number of public- and private-sector groups. During the first half of 2019, PEA analyzed the outcomes of the 2017-2018 multifamily pilot projects, which included the installation of energy saving measures at:

- **Mission First Apartments:**

Rhawn Street, a 55-unit complex in Northeast Philadelphia; Academy Road, a 40-unit property; Larchwood Avenue, a 15-unit building in West Philadelphia

- **Friends Rehabilitation:**

Sarah Allen Senior Homes (SASH), a 7-story, 87-unit building located at 4035 Parrish Street in West Philadelphia



Photo: Mission First Housing

Energy usage impacts of the project were mixed over the time period that PEA analyzed. Most properties saw moderate weather-adjusted savings of up to 20% in electricity and/or gas usage. However, Academy Road saw an increase in gas usage, and Rhawn Street and Sarah Allen Senior Homes saw no notable change in gas and electricity usage. Some of these unexpected outcomes were due to non-functional equipment being placed back into service during the upgrades, resulting in higher energy usage.

ENERGY EFFICIENCY TECHNICAL ASSISTANCE

Experience gained in the early PEA multifamily pilots positioned PEA to function as a connector between property owners and the utilities. PEA continues to support owners of multi-unit properties to educate them on available utility incentive programs, financing solutions, and other services that can help them reduce energy consumption and costs. Non-profit organizations, owners of affordable housing and small businesses can take advantage of technical assistance from PEA at no cost to them. PEA demonstrated this support for two property owners in 2019-2020:

- **The Veterans Group**

The Veterans Group is a non-profit that provides transitional homes to veterans in the Powelton neighborhood. The Veterans House consists of two buildings with up to forty beds and an average annual combined utility usage of approximately \$24,000. PEA provided an assessment of Veterans Group's needs and ultimately referred them to PECO's small commercial direct install program and PGW's equipment rebate options. PECO conducted a site assessment and installed electricity-saving measures.

- **Mission First Parkside**

The first PEA multifamily pilot included properties owned by the Mission First Property Management Group. In 2019, Mission First contacted PEA for guidance on having the Mission First Parkside set of buildings evaluated for energy efficiency direct install eligibility. Mission First sought to incorporate energy cost savings in a planned capital project for the 16-building, 82-unit complex. PEA, in collaboration with PECO and PGW, identified eligible energy efficiency measures that could be implemented at Mission First Parkside and supported Mission First in accessing those services.

MULTIFAMILY HOUSING GREEN RETROFIT ACCELERATOR WORKSHOP

In November 2020, PEA held a Multifamily Housing Green Retrofit Accelerator Workshop targeting multifamily property owners and energy retrofit service providers. PEA led the workshop and discussion about low- and moderate-income green housing to begin paving the way to assist property owners and operators in executing these projects. PEA's role in this market is to use clean energy to accelerate development and to assist in improving public health. The workshop was attended by representatives of 17 organizations.

BlocPower and Inclusive Prosperity Capital joined PEA to debut and demo new tools for the Philadelphia market to assist property owners in designing, financing, and implementing energy efficiency projects in multifamily properties housing low-income households. In between demos, workshop attendees broke into small groups consisting of property owners and service providers to engage in discussions about finding services for assessment and design of energy efficiency projects, assessing the initial project viability and securing project financing.

NEW FINANCING OPTIONS

PEA has partnered with Inclusive Prosperity Capital, a non-profit financial firm that has underwritten hundreds of loans to boost energy efficiency for residential and commercial buildings, to introduce pre-development and project implementation loans created to specifically address older properties that need energy improvements. The new loan products—Navigator and Catalyst—are designed for owners of multifamily and non-profit properties serving low-income Philadelphians.

The Navigator pre-development loan is a simple, unsecured line of credit designed to pay for scoping and design of an energy project at a low 1.99% interest for up to 24 months for affordable housing properties. Owners who need additional funding to make their energy improvements can use the Catalyst Loan. The unsecured Catalyst Loan offers terms of 7 years at 5.79% interest and up to 20 years at 6.99% interest and can cover construction costs from \$50,000 up to \$2 million.

BLOCMAPS PHILLY

BlocPower, a Brooklyn-based energy technology startup, began developing a powerful new tool called BlocMaps Philly that will be launched in 2021. BlocMaps is a user-friendly way for multifamily property owners and cultural institutions to understand the potential for energy savings interventions at their properties. The model uses public and private building data, including energy benchmarking data, building audit reports, and utility bill history to identify opportunities for energy saving building improvements. Property owners will be able to locate their properties and explore customized reports outlining those opportunities and can connect with PEA to receive technical assistance for taking on those energy projects.

IPC ensures that the project is designed to save more than the monthly loan amounts, which is the mark of a good investment for the owner and lender.

This partnership will allow PEA and Inclusive Prosperity Capital to work collectively to unlock energy savings, locally driven economic development, and improved health outcomes for the residents of Philadelphia.

SMALL BUSINESSES/ COMMERCIAL BUILDINGS



PEA serves small businesses and commercial buildings of all sizes through financing tools, technical assistance, research and other funding support.

In 2019, PEA launched C-PACE, a new financing tool that helps commercial and industrial building owners invest in energy efficiency and clean energy projects. PEA projects it will drive \$30 million in projects over 5 years. Additionally, during 2019 and 2020, PEA helped three local businesses and institutions complete projects using various other financing, grants, and programs and reported findings on its corner store energy efficiency pilots.

cut energy bills
create jobs



\$8 million
in C-PACE projects closed

55
projects in C-PACE pipeline

740kW
solar project
installed at SoNo

FINANCING FOR



ENERGY EFFICIENCY PROJECTS



RENEWABLE ENERGY PROJECTS



WATER EFFICIENCY PROJECTS

COMMERCIAL PROPERTY-ASSESSED CLEAN ENERGY FINANCING

Philadelphia C-PACE



PHILADELPHIA C-PACE

Commercial Property-Assessed Clean Energy (C-PACE) financing helps commercial property owners pay for energy efficiency, water conservation, and clean energy projects. This innovative financing tool allows borrowers to save money on utility bills while reducing their carbon footprints.

Pennsylvania authorized the creation of C-PACE programs with the passage of Act 30 of 2018. With the leadership of Councilmember Derek Green (At-Large), Philadelphia City Council authorized C-PACE for the City of Philadelphia in Summer 2019 and assigned PEA as Program Administrator. In this role, PEA reviews and approves applications, manages the billing and lien processes, engages in market education, and supports the growth of the program.

PEA officially launched the Philadelphia C-PACE program in Fall 2019. Since then, PEA has led or participated in over 50 in-person or virtual events to educate stakeholders about the benefits of C-PACE.

C-PACE in Action

In 2020, Philadelphia was home to the first three C-PACE projects to close in Pennsylvania. These deals brought more than \$8MM of private capital to support clean energy investments in the City. These investments came at a time when businesses faced unprecedented uncertainty amid the COVID-19 pandemic. The borrowers are expected to avoid more than 19,209 MTCO₂e and save over \$3.3MM on their utility bills over the lifetimes of the projects.



Photo: J-Centrel



Photo: Lisa Shulock



Photo: The Met

J-Centrel

SHIFT Capital borrowed \$1,500,000 in C-PACE financing from Twain Financial to pay for energy and water efficiency upgrades to a new mixed-use development in the Kensington-Harrowgate neighborhood of Philadelphia. The C-PACE measures include LED lighting, window replacements with insulation and low-e glazing, energy recovery units, variable refrigerant flow heat pumps, and low-flow plumbing in the commercial portions of the buildings.

Olde City Day School

Greenworks Lending and the Capers Company LLC executed the financial close of the first project in Pennsylvania to use C-PACE financing for a renewable energy project. Capers Company LLC borrowed \$519,020 in C-PACE financing from Greenworks Lending to pay for a 212 kilowatt solar system built by K.E.S. LLC on the roof of the building that is home to Olde City Day School and other tenants.

The Met

Enhanced Capital and EB Realty Management (“EBRM”), owners of The Met, closed the first project in Pennsylvania to retroactively use C-PACE financing. EBRM borrowed \$6,000,000 in C-PACE financing from Enhanced Capital to pay for energy efficiency upgrades for the former Philadelphia Metropolitan Opera House, renovated in 2018. Philadelphia allows retroactive financing for up to two years after project completion.

Looking ahead, there are over 50 projects in the C-PACE pipeline with a total of over \$80MM of potential C-PACE financing.

BENEFITS OF C-PACE:

- 100% upfront financing for hard and soft costs
- Achieve immediate savings on energy and water bills
- Competitive cost of capital for exceeding new energy codes
- Up to 30-year terms can support projects with long payback periods
- Special assessment stays with the property if a sale occurs
- Improve property value through:
 - o Reduced carbon footprint
 - o Reduced operating cost
 - o Capital improvements

HOW C-PACE WORKS:



“C-PACE is a game-changing initiative for our City. Philadelphia now has a new financing tool to build a robust clean energy economy that will fight climate change, improve public health and well-being, and save our commercial sector money.”

—Derek S. Green, Councilmember At-Large



Helping Businesses Thrive



Photo: Philadelphia Insectarium and Butterfly Pavilion

PHILADELPHIA INSECTARIUM & BUTTERFLY PAVILION

The Philadelphia Insectarium & Butterfly Pavilion, a science museum that houses a 7,000 sq. ft. tropical butterfly pavilion and serves as a nature showcase, used the building assessment provided as part of PEA's Small Business Energy Efficiency Pilot to design a comprehensive project that solved multiple issues.

The Insectarium utilized financing from West Philadelphia Financial Services Institution (WPFSI) with a 7-year, 5.5% loan. The \$92,000 project included HVAC upgrades and a Butterfly Pavilion shading system that is designed to reduce solar heat gain in the summer months. The project is projected to reduce their energy costs by 20% annually.



Photo: Curtis Institute

CURTIS INSTITUTE ENERGY CONSERVATION PROJECT

PEA supported the Curtis Institute to scope, procure and execute a campus-wide energy conservation project. PEA engaged with the Curtis Institute to understand their facility needs, short-term goals, and larger planned capital projects and determined that a guaranteed energy savings project with an energy service company (ESCO) was a good fit for Curtis. PennSEF, a program of the Pennsylvania Treasury and the Foundation for Renewable Energy and the Environment, supported this effort by facilitating the RFP process and serving as an owners' representative for a guaranteed energy savings agreement.

In 2019, the Curtis Institute signed a preliminary contract with The Efficiency Network to conduct an investment grade audit and, pending final approval, to install the energy conservation measures (ECMs) identified in the audit. In 2020, Curtis signed a guaranteed energy savings agreement with The Efficiency Network that will result in a minimum 13% energy savings with an annual cost savings of \$35,000. The \$650,000 project includes upgraded lighting and building system controls in four Curtis Institute buildings.



Photo: Solar States

SONO SOLAR PROJECT

Completed in summer 2020 on the roof of the “SoNo” development at 5th and Spring Garden Streets, the SoNo solar project, owned by developer Alliance HSP, is the first multi-tenant commercial solar project in Pennsylvania. The project enabled Kensington-based solar company Solar States to retain workers during the economic downturn that resulted from the COVID-19 pandemic, including new graduates from PEA’s Bright Solar Futures program. Solar States partnered with Armour and Sons Electric to complete one of the largest solar arrays in Philadelphia.

The 740-kilowatt DC solar array is made up of approximately 2,000 solar panels and is visible from I-95.

Alliance HSP redeveloped the site from a former distribution center into a mixed-use project with Yards Brewery, the City of Philadelphia Archives, and Target. PEA provided technical assistance via research on multi-tenant solar project management and available state grants to ensure the project would be easy to administer and would provide cost-competitive electricity to two of the tenants, Yards Brewing Company and the City Archives.

PEA hosted a press conference that featured Governor Tom Wolf, Mayor Jim Kenney, Councilmember Derek Green, Yards Brewing CEO Trevor Prichett, Alliance HSP Director Matt Handel and Solar States Founder Micah Gold-Markel to celebrate the successful completion of this first-of-its-kind solar project in the Commonwealth.

SMALL BUSINESS PROGRAM EVALUATION

PEA concluded the second phase of its Small Business Energy Efficiency Program in the fall of 2019. The program provided free energy assessments to corner stores and restaurants citywide. In the two phases, PEA worked directly with over 250 businesses, conducted audits of over 100 of those businesses, and delivered nearly 60 proposals with recommended energy conservation measures. After 3 stakeholder sessions and a robust evaluation, PEA ended the pilot, which yielded valuable insights into the potential for energy conservation in Philadelphia’s small businesses.

PEA worked with a set of direct program partners to deliver services in the two phases of its program, including Penn State University (PSU) and Private Energy Partners (PEP) in Phase 1, and Lime Energy and West Philadelphia Financial Services Institution (WPFSI) in Phase 2. Energy audits revealed opportunities for lighting, HVAC, refrigeration, and domestic hot water measures. These measures had a wide range of initial costs and projected energy savings. Overall, projects had an average cost of about \$13,000 with an average expected savings of \$2,700/year in Phase 1 projects and \$1,500/year in Phase 2 projects. Both phases included utility and state grants and rebates.

Friction within the program process, project costs, and other factors meant that business owners did not move forward with recommended projects most of the time, despite projects having positive cash flow and supportive financing through WPFSI. During the two pilots, PEA successfully supported several projects, which had meaningful impacts on utility costs, functionality, and comfort of the businesses, ultimately resulting in increases in revenue.

Looking forward, PEA will continue working with local partners to serve this important neighborhood infrastructure.

Energy Connections



Photo: Smart Energy Decisions

ACCELERATE PHILLY CONFERENCE

To bring more clean energy industry players into Philadelphia, PEA and Smart Energy Decisions hosted a two-day Accelerate Philly conference in December 2019. The landmark event brought together large power users, renewable energy developers, suppliers and government.

City Council President Darrell Clarke helped kick off the event by affirming that Philadelphia is an ideal target location for companies eyeing new business growth in the clean energy economy. At-Large City Councilmember Derek Green also spoke about positioning Philadelphia as a national leader in pioneering municipal strategies for energy efficiency and economic development.

Accelerate Philly featured sessions on best practices for renewables and energy efficiency sourcing, a session on growing diversity in these industries, and study tours of clean energy projects at Comcast, the Navy Yard and the Philadelphia Museum of Art. The event attracted over 200 attendees and was hosted at The Logan.

Former City Councilmember At-Large, Blondell Reynolds Brown, received the Clean Energy Champion Award from Smart Energy Decisions for her work to lead innovation in Philadelphia's clean energy economy as Chair of City Council's Committee on the Environment. Additionally, Smart Energy Decisions donated to Philadelphia's local American Association of Blacks in Energy (AABE) chapter to support their continued work to promote diversity in the energy profession.

Policy and Legislation

In 2019 and 2020, PEA supported City Council, the Office of Sustainability (OOS) and others to pass new legislation that helps advance solar and energy efficiency development in Philadelphia by reducing costs, simplifying regulations, creating incentives and requiring evaluations.



Photo: Jared Piper

ESTABLISHING SOLAR WEEK

In September 2020, Philadelphia City Council permanently recognized the third week in August as Solar Week in the City of Philadelphia. The resolution recognizes the important role that solar will play in the City's transition to carbon neutrality and the jobs that solar will create. To bolster the adoption of solar in Philadelphia, the resolution also recognizes the importance of an annual Solar Week and PEA's central role in promoting, educating and providing training on solar during that week.

ROOFTOP SOLAR COLLECTORS BY RIGHT

In 2019, Councilmember Derek Green introduced legislation to allow roof-mounted solar collectors to be constructed without special zoning approval. The bill amended the existing building code ('The Philadelphia Code') to permit solar collectors and associated solar collector support structures to extend above height limits up to 9 feet. The new regulations apply to all residential, commercial and industrial zoning uses.

SOLAR PERMITTING FEES

Significant changes were made to the solar permitting process in 2019 and 2020. In 2019, City Council established a \$200 cap for building permits for solar installations, dramatically reducing the cost of permitting. This common-sense change was led by Councilmember Derek Green.

In 2020, the City's Department of Licenses and Inspections created a new EZ Permit for qualifying installations following the rollout of online permitting earlier in the year. The EZ Permit system does not require plans as part of the permit submission and offers plan review within three business days for online submissions, and same day review for in-person submissions. To celebrate this big change, Solar States, PEA's 2020 Solarize Philly installer, offered a \$250 "EZ Permit Discount" to qualifying Solarize Philly participants who signed a contract prior to November 30, 2020.

C-PACE LEGISLATION

Governor Wolf signed Commercial Property-Assessed Clean Energy (C-PACE) legislation into law in June 2018, laying the groundwork for PA counties to move forward with local programs. PEA led a group of statewide stakeholder sessions in partnership with the PA Department of Environmental Protection, the Sustainable Energy Fund, the Keystone Energy Efficiency Alliance and many others.

In 2019, Councilmember Derek Green sponsored the Philadelphia C-PACE bill in City Council, which approved the legislation in July 2019 and designated PEA as Program Administrator. Mayor Kenney signed C-PACE into law in August 2019.

BUILDING ENERGY PERFORMANCE POLICY (BEPP)

OOS worked with City Council and key stakeholders, including PEA, to introduce and pass a new Building Energy Performance Policy (BEPP), introduced in June 2019 by former At-Large City Councilmember Blondell Reynolds Brown. Philadelphia already requires that all buildings over 50,000 square feet must provide annual energy consumption data through Philadelphia Code Section 9-3402, the Energy Benchmarking and Disclosure Law, and this bill adds an additional requirement that orders simple inspections and tune-ups of energy and water systems once every 5 years. OOS designed regulations that outline procedures for implementation, and the requirement is expected to go into effect in 2021.

BEPP is expected to reduce energy costs by 5-20% in participating buildings. Since 72% of our citywide carbon emissions come from commercial and industrial buildings, this will be significant.



Photo: Jared Piper

CITY SOLAR REBATE

In 2019, with the leadership of former City Councilmember At-Large, Blondell Reynolds Brown, Council established the Solar Panel Incentive Program, known as the Philly Solar Rebate. The program is run by OOS and administered on their behalf by PEA.

The rebate program provides an incentive payment of \$0.20 per watt for residential solar projects and \$0.10 per watt for commercial projects, with 10 percent of funds set aside to serve low- and moderate-income households. Solar projects installed after July 1, 2019 were eligible for the rebate.

PEA opened the program for applications from March to June 2020, since the program was only funded in Fiscal Year 2020. 199 residential and 3 commercial rebate applications were approved,

utilizing \$249,335 of the initial \$250,000 allocation for the rebate program. Of the 199 residential applications approved, 26 represented low- to moderate-income households. PEA received significantly more interest than funds and maintains a waitlist until such time as the City provides additional funding.

The 202 approved applications for FY20 represented fourteen different solar installers operating in Philadelphia. PEA promoted the rebate program through direct outreach to Philadelphia installers, Solarize Philly participants and social media.

Celebrating Solar in Philadelphia



Photo: Jared Piper

SOLAR WEEK 2019

In 2019, PEA's solar team launched the inaugural Solar Week with a series of curated events to highlight the success of the Solarize Philly program. The high point of the weeklong series was Mayor Jim Kenney's signoff on the Solar Rebate legislation, which offered an incentive payment from the City for residential or commercial solar installation completed after July 1, 2019.

Solar Week 2019 also included the celebration of City Council's passage of the Commercial Property Assessed Clean Energy (C-PACE) legislation that allows commercial property owners to finance clean energy projects on their property tax bills.

The weeklong set of solar events featured community town hall gatherings and an Ice Cream Crawl that crisscrossed the city to visit ice cream shops that were serving exclusive flavors in honor of Solar Week.

PEA coordinated a set of activities that included site visits to unique solar installations, like the Navy Yard, and tours of houses with recent rooftop solar installations in neighborhoods throughout Philadelphia.

"Solar lowers electric bills, creates living wage jobs and reduces our climate impact."

—Mayor Jim Kenney (Solar Week 2020 Keynote and Bright Solar Futures Graduation)



Photo: Mayor's Office

SOLAR WEEK 2020

PEA celebrated Philadelphia's second annual Solar Week in August 2020. Highlights of the week featured a series of virtual events including a solar home tour, solar art and story competitions, a solar career panel, and graduation of Bright Solar Futures summer high school solar trainees. The week also featured a special webinar series on topics that included going solar during COVID-19, using solar as a tool for economic recovery, scaling up PA's utility-scale solar market to combat climate change, and trailblazing commercial solar.

In addition to the 250 participants who registered for the 2020 Solar Week webinars and events, the virtual sessions also reached 2,500 viewers via live video streaming across social media channels.

PECO's Green Power Connect (GPC) team partnered with PEA to host a solar collaborative during Solar Week 2020. During the collaborative, PECO's GPC team shared updates and best practices for interconnection processes.

Philadelphia Solar Week has provided an opportunity for a diverse set of stakeholders to celebrate the growth in solar adoption and to highlight success stories while encouraging more Philadelphians to install solar at their properties. To build upon the success of Solar Week 2019 and 2020, City Council passed a resolution in September 2020 to permanently recognize the third week in August as Solar Week in the Philadelphia.

2019 Highlights



6

PRESS
CONFERENCES



78

COMMUNITY
OUTREACH EVENTS

2020 Highlights

7

VIRTUAL SESSIONS
AND EVENTS



NEARLY

3,000

SESSION VIEWERS VIA LIVE STREAMING

ADVANCING DIVERSITY, EQUITY, INCLUSION AND JUSTICE

The national protests of summer 2020 calling for real action in dismantling institutionalized racism brought an opportunity for PEA to take a deeper look at the work it is doing to center diversity, equity, inclusion and justice (DEIJ) in its projects and programs. PEA views energy as a tool for addressing Philadelphia's biggest challenges, like public health, poverty, education, and equitable development, whose burden is disproportionately borne by the Black community.

PEA is committed to living its values of diversity and equity in every project and program, and in 2020, PEA focused on a number of concrete actions to drive forward DEIJ in both the clean energy industry and in PEA's own operations.

PEA identified three specific action steps in 2020 and continues to prioritize this work.

- 1) PEA is focusing on systemic solutions to transportation in communities of color. Bright Solar Futures students often cannot get solar jobs without a driver's license, and too few of the students PEA serves can get one. PEA paid for the 2020 Solar Fellowship cohort to take Driver's Ed and is working with Ride To Work and PowerCorps PHL to support long-term, scalable solutions.
- 2) PEA is moving forward with supporting the build-out of a state-of-the-art Solar Lab at Frankford High School. The Lab will be completed in 2021 and will provide a resource that unlocks family-supporting careers for students of color.

- 3) PEA has looked inward at diversity, equity and inclusion in its own hiring and contracting processes and has begun to establish norms that support its goals of having its staff, board and vendors reflect the community it serves. That includes:

- Reviewing and redesigning PEA's outreach process for when it posts a job opening. Led by Maxine Dixon, PEA created a standard process that ensures it is connecting with people of color outside of its typical networks.
- When hiring, PEA tracks the diversity of its candidate pool and reports out on those results to its board. PEA's goal is for half of all candidates to be people of color.
- PEA has formed a board committee focused on contracting that seeks to identify procurement language that can go beyond the City's requirements to encourage local, diverse contracting. This work is ongoing.
- PEA will begin tracking its own vendor diversity beginning in FY22 and will strive to spend its dollars with diverse and local vendors wherever feasible.

PEA also continues to make significant headway with national organizations and legislators to secure long-term funding for programs like Built to Last and Bright Solar Futures, which address housing and employment issues that disproportionately affect communities of color.

PEA will continue to spotlight this particular focus and in future years will be able to provide more specific metrics to track its progress.

PEA is a municipal authority and political subdivision of the Commonwealth of Pennsylvania, formed by the City of Philadelphia under the Pennsylvania Municipality Authorities Act, 53 Pa.C.S. §. The work of the Authority would not be possible without its staff, board of directors, interns, consultants and partners.

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