

# BOROUGH OF PROSPECT PARK COMMUNITY ENERGY PLAN

PREPARED BY DMR ARCHITECTS  
MARCH 2023



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Mayor Mohamed T. Khairullah  
Borough of Prospect Park

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## ACKNOWLEDGMENTS

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New Jersey Board of Public Utilities Clean Energy Program, Community Energy Planning Grant



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## EXECUTIVE SUMMARY

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This Community Energy Plan is prepared for the Borough of Prospect Park through a grant provided by the New Jersey Board of Public Utilities, with technical assistance provided by Sustainable Jersey. Consistent with the Community Energy Planning Grant Goals, the purpose of this document is to serve as an action plan for the Borough to promote and adopt cleaner and less expensive energy sources and advance the objectives of the State of New Jersey 2019-adopted Energy Master Plan, which aims to generate 100% of the State's energy through renewable sources and reduce greenhouse-gas emissions to 80% of 2006 levels by 2050.

The Energy Master Plan lays out two dozen initiatives that the Borough intends to pursue over the next three to five years to reduce energy consumption and dependence upon carbon based energy sources by both Borough government buildings and fleet vehicles as well as those of the Borough's residents and businesses. It also identifies further opportunities the Borough can explore to build on its success in implementing the 24 energy actions while improving local quality of life and economic vitality. The initiatives to reduce energy usage and promote renewable energy generation include regulatory actions, public outreach to encourage action by private citizens, businesses, and organization, and direct Borough expenditures on public buildings and public rights-of-way.

The initiatives identified in this Plan include, but are not limited to:

- ▶ Electrifying municipal fleet vehicles;
- ▶ Installing public EV charging stations;
- ▶ Zoning to permit private solar installations and community solar projects, as well as battery energy storage systems;
- ▶ Installing on-site renewable energy generation systems and battery energy storage systems on municipal properties, and improving energy efficiency of municipal buildings;
- ▶ Working with the State, utilities providers, and contractors to reduce cost barriers to residential and commercial energy efficiency improvements and renewable energy generation;
- ▶ Encouraging developers to adopt green building practices;
- ▶ Educating and engaging the public in a collective effort to reduce energy consumption and switch to renewable energy sources;and
- ▶ Ensuring that low- and moderate-income households are not excluded from the benefits of the Borough's initiatives.

This Community Energy Plan is being written at a time when both the State and Federal governments are providing financial incentives for governments, businesses, and households to improve energy efficiency and adopt renewable energy generation and electric or alternative fuel vehicles, making clean energy more affordable than it has ever been.

Prospect Park is considered an overburdened community, with more than 35% percent of its population earning incomes below 200% of the poverty level and the Borough receiving a municipal revitalization index rating of 58 out of 100 from the New Jersey Department of Community Affairs. It is also a predominantly residential community with limited tax ratables like commercial or industrial uses. These economic conditions constitute obstacles to the Borough and its constituents taking actions needed to reduce carbon-based energy consumption in the absence of the current incentives. The future of these incentives - whether they will be renewed or eliminated in the coming years - is unknown. Adopting an energy plan and strategically prioritizing the initiatives the Borough will pursue over the next few years is crucial to ensure that the current opportunity is not missed.



## GLOSSARY OF TERMS AND ABBREVIATIONS

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To save space in this document, the following terms and abbreviations are used to reference certain technical or scientific language, policies or laws, State or Federal government agencies and departments, technology, vehicle types, and the like.

**Alternative Fuel:** Vehicle propulsion fuels other than diesel or gasoline and having a lesser net environmental impact than those traditional fuels.

**BESS:** Battery Energy Storage System

**BEV:** Battery Electric Vehicle - A vehicle that is powered entirely by an electric battery instead of a combustible fuel. These are also referred to as PEVs - Plug-in Electric Vehicles.

**CO<sub>2</sub>:** Carbon dioxide

**Community Solar:** One or more solar installations providing energy to buildings and uses on other properties, typically through a subscription service.

**Complete Streets:** A transportation planning and urban design principle favoring street and road design that accommodates multiple modes of travel rather than prioritizing single-occupancy vehicles.

**DPW:** The Borough of Prospect Park's Department of Public Works

**EMP or NJ EMP:** 2019 New Jersey Energy Master Plan

**EPA:** The United States Environmental Protection Agency

**EV:** Electric Vehicle - Generic term for a vehicle that is propelled partially or entirely by an electric powered motor in lieu of or in addition to an engine powered by gasoline or another combustible fuel.

**EVSE:** Electric Vehicle Service Equipment - This is another way of saying EV charging equipment.

**GHG or Greenhouse Gases:** Gases emitted through both natural and anthropogenic processes which contribute to the greenhouse effect in the Earth's atmosphere, most commonly in reference to CO<sub>2</sub> and methane

**HEV:** Hybrid Electric Vehicle - A vehicle that is primarily propelled by a combustible fuel but which can be propelled to a limited extent by an electric battery that is typically charged by the act of braking.

**ICE:** Internal combustion engine - a vehicular engine which uses a combustible fuel like gasoline for propulsion. Typically does not include HEVs.

**LEED:** Leadership in Energy Efficient Design - a program hosted by the United States Green Building Council (USGBC) which grants certification to buildings, neighborhood developments, and cities that meet the minimum standards for one of four levels of efficient design, and which offers a credential program to professionals interested in demonstrating proficiency in green building design and operation.

**LMI Household:** Low- and/or Moderate-Income Households, as defined by U.S. Department of Housing and Urban Development (HUD).

**Microgeneration:** Any small-scale production of heat or electricity through a low- or no-carbon source, including solar photo-voltaic systems, small wind turbines, and other on-site systems typically powering a single property.

**NJ DCA or DCA:** New Jersey Department of Community Affairs

**NJ DEP or DEP:** New Jersey Department of Environmental Protection

**NJ DOT:** New Jersey Department of Transportation

**NJ Transit:** New Jersey Transit

**PHEV:** Plug-In Hybrid Electric Vehicle - A vehicle that can be propelled by an electric battery for a greater distance than an HEV and propelled by a combustible fuel when the battery is drained. Unlike an HEV, the electric battery of a PHEV can be charged by EVSE.

**Private Solar:** Any form of solar installation intended to provide energy to the buildings or uses located on the same property as the installation.

**US DOE or DOE:** The United States Department of Energy

**VMT:** Vehicle miles traveled - a measure of the number of miles traveled by one or more vehicles over a specified period of time.

## INTRODUCTION & PURPOSE

This Community Energy Plan (CEP) has been prepared for the Borough of Prospect Park in Passaic County, New Jersey, and is funded through the 2022 Community Energy Plan Grant program administered by the New Jersey Board of Public Utilities in partnership with Sustainable Jersey. The goal of the program and of the Community Energy Plan is to advance the purposes and objectives of the 2019 New Jersey Energy Master Plan, which include:

- ▶ Generating 100% of the State's electricity through carbon-neutral methods, which includes balancing carbon emissions with equal rates of carbon removal; and
- ▶ Reducing greenhouse gas emissions to 80% of 2006 levels.

The Borough of Prospect Park desires to not only contribute to the State's pursuit of its energy goals, but also to take actions to reduce the energy usage and greenhouse impact from services it provides to its residents and businesses and to help its residents and businesses reduce their own energy and carbon footprints as well as their energy costs.

The CEP Grant program requires grant recipients to select from 38 initiatives to reduce local energy usage, including initiatives related to clean vehicles, solar energy, energy efficiency of buildings, green building practices, accessibility of clean energy for low- and moderate-income communities, and energy storage. This CEP for Prospect Park identifies 24 initiatives that the Borough desires to pursue over the next for the next three to five years, or beyond, to reduce the Borough's climate impact, energy consumption, and energy costs. Those initiatives are:

### Strategy 1. Reduce Energy Consumption and Emissions from the Transportation Sector

- ▶ 1.4 Purchase Alternative Fuel Vehicles
- ▶ 1.5 Improve Municipal Fleet Efficiency
- ▶ 1.6 Install Public EV Charging Infrastructure

### Strategy 2: Accelerate Deployment of Renewable Energy and Distributed Energy Resources

- ▶ 2.1 Adopt Supportive Zoning and Permitting for Private Solar
- ▶ 2.2 Post Solar Permitting Checklist
- ▶ 2.3 Adopt Zoning and Permitting for Community Solar
- ▶ 2.4 Train First Responders on Solar
- ▶ 2.5 Train Non-Emergency Staff on Solar
- ▶ 2.6 Install On-site Municipal Renewable Generation
- ▶ 2.7 Buy Renewable Electricity for Municipal Facilities
- ▶ 2.8 Offer a Solar Employee Benefit Program
- ▶ 2.9 Institute a Community-wide Solar Purchasing Program

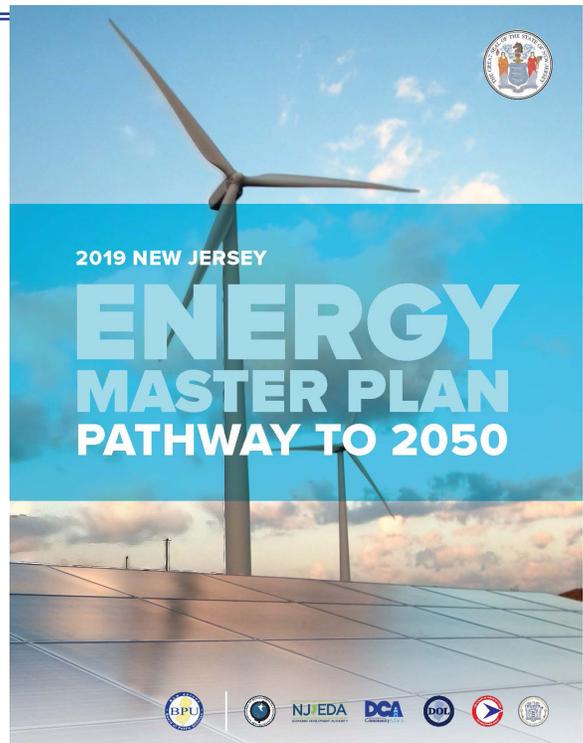


Figure 1. NJ Energy Master Plan Cover Page

- ▶ 2.13 Host a Community Solar Project on Municipal Property

### Strategy 3: Maximize Energy Efficiency and Conservation and Reduce Peak Demand

- ▶ 3.1 Upgrade Energy Efficiency in Municipal Facilities
- ▶ 3.2 Residential Energy Efficiency Outreach Campaign
- ▶ 3.3 Commercial Energy Efficiency Outreach Campaign

### Strategy 4: Reduce Energy Consumption and Emissions from the Building Sector

- ▶ 4.3 Require Developers to Complete Green Development Checklist
- ▶ 4.4 Conduct Outreach Targeting New Construction in the Community

### Strategy 6: Support Community Energy Planning and Action with Emphasis on Encouraging and Supporting Participation by Low- and Moderate-Income/Environmental Justice Communities

- ▶ 6.1 Make Community Energy Planning Inclusive
- ▶ 6.2 Conduct Energy Efficiency Outreach to Low- and Moderate-Income Residents
- ▶ 6.4 Support Low- and Moderate-Income Community Solar Subscriptions
- ▶ 6.5 Conduct Energy Efficiency Outreach to Community-Serving Institutions

### Strategy 7: Expand the Clean Energy Innovation Economy

- ▶ 7.1 Adopt Energy Storage Policies
- ▶ 7.2 Install an Energy Storage Project

Each action described in this Plan has the potential to improve quality of life and reduce energy costs and emissions in the Borough by educating the public about opportunities and practices that can reduce their energy costs and environmental footprints, directly reducing the Borough's energy usage, and creating opportunities for new and existing buildings to be more efficient.

## COMMUNITY PROFILE

### DEMOGRAPHICS

The Borough of Prospect Park is a suburban municipality with a population of 6,372 (2020) or a density of 13,703.2 persons per square mile. It is located northwest of the City of Paterson, and located in between the Boroughs of Hawthorne and Haledon. Nearby landmarks include the High Mountain Preserve and the William Paterson University Campus to the northwest.

According to the U.S. Census Bureau's Longitudinal Employer – Household Data (LEHD) On the Map data tool, 2,275 of the Borough's residents were in the workforce in 2019, and the top five destinations of employment for those workers were Paterson, NJ (7.8%), New York City (5.7%), Clifton, NJ (3.3%), Hackensack, NJ (3.2%), and Paramus, NJ (2.7%), with most of the other major work destinations scattered around northern New Jersey. The 2020 American Community Survey found that personal automobile made up 82% of workers commutes compared to 8% using public transit, even with the proximity to passenger rail in Paterson and Hawthorn



Map 1. Borough Map

and the Borough's location along New Jersey Transit Bus Route 744 which connects to the Cities of Paterson, Clifton, and Passaic, as well as the Borough of Haledon.

The Borough is a low-income community compared to the rest of New Jersey, with a median household income of \$48,838 in 2020 and 16.8% of the population at or below the poverty level (compared to \$85,245 and 9.7%, respectively, statewide). Only 46% of occupied housing units in the Borough are owner-occupied, compared to 64% statewide.

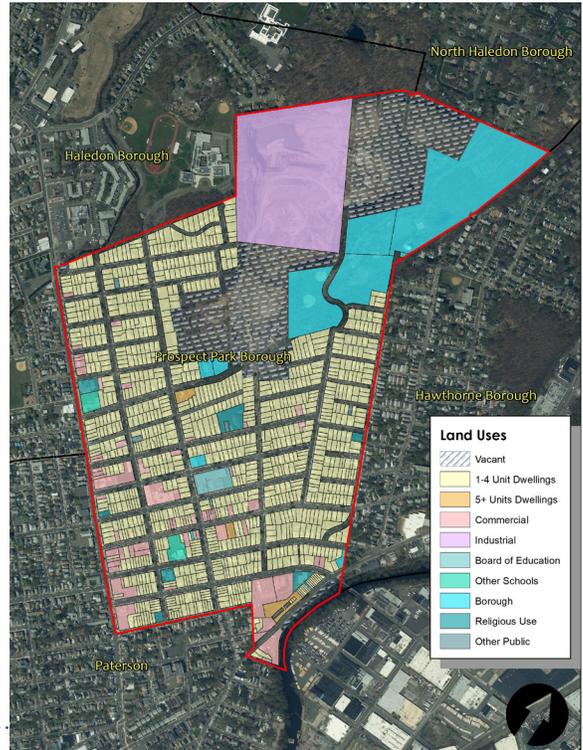
With the majority of households renting their homes, there is a limit to the actions they can take to adopt green energy. For example, renters cannot unilaterally install solar panels on their homes or electric vehicle charging equipment, nor can they always choose to replace older, less efficient large appliances with newer, more efficient ones. Furthermore, the median household in Prospect Park may have challenges affording these improvements.

**ENERGY AND VEHICLE USAGE PATTERNS**

Based on 2021 property tax data, more than 45% of the Borough's land area is devoted to residential uses, with nearly all of those classified as one-to-four-family dwellings (for comparison, the 2020 U.S. Census identified 2-family dwellings as the predominant housing type). Another one-third of the Borough's land is comprised of areas currently or formerly used for quarrying. Consequently, the Borough generates significant vehicle-miles-traveled (VMT) not only from passenger cars (14,156,303 miles in 2019), but also from trucks of all types (5,429,696 miles), and buses of all types (231,402 miles).

North Jersey Transportation Planning Authority data from 2019 shows truck VMT associated with Prospect Park in that year exceeding the 2017 measurements by nearly 2.5 million miles while VMT for other vehicle types varied less significantly across the two years. The increase in truck traffic is related to reclamation activities on the quarry property. Personal automobiles saw a slight drop in VMT between those two years. Data from 2020 and 2021 would likely show an even more significant drop in car usage due to fewer people commuting to work or gathering in public places during the peak of the COVID-19 Pandemic.

The Borough's estimated 2015 Greenhouse Gas Emissions (GHG) were attributed primarily to residential natural gas usage (37.02%) and general vehicle use (31.8%). Residential electric consumption made up 17.1% of GHG emissions, commercial electric and natural gas consumption comprised 9.99% of emissions, and industrial electric and gas consumption made up 1.27% of emissions. In 2020, vehicles contributed to 45.01% of GHG emissions, residential



Map 2. Land Use Map

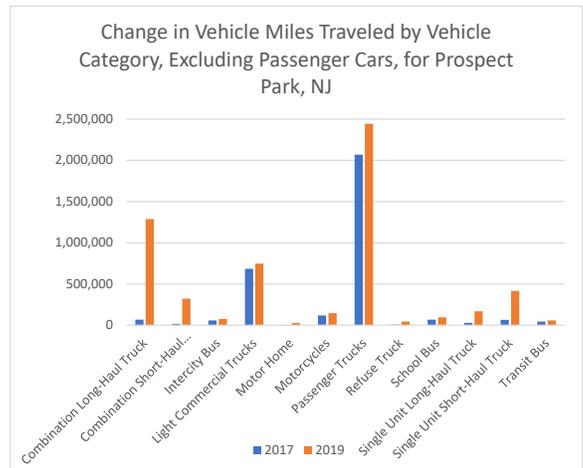


Figure 2. Change in VMT 2017 and 2019

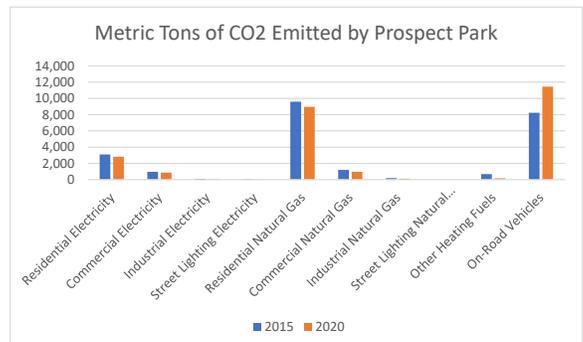


Figure 3. Change in MTCO2e 2015-2020

natural gas 35.24%, and residential electric 11.11%. Emissions associated with electricity and natural gas consumption decreased across all uses and fuel types during that five year period. Notwithstanding, total emissions from the Borough increased by 1,322 metric tons of CO<sub>2</sub>, driven by 3,206 metric tons emitted from vehicles.

It should be noted that between 2015 and 2021, gross electric consumption in the Borough increased from 16,618,586 kWh to 16,986,563 kWh (increase of 2.214%). Meanwhile, total natural gas consumption decreased from 2,061,225 Therms to 1,995,381, or a drop by 5.135%. However, during that five-year period residential electricity use increased by just under 315,000 kWh and commercial electricity use increased by over 200,000 kWh, while industrial electricity usage decreased by 191,000 kWh. Electricity usage attributed to street lighting remained relatively steady. Natural gas usage decreased most rapidly among industrial users (29.3%) and least among residential users (4%). The 2020 American Community Survey data for Prospect Park (Table B25040) indicates that 1,498 of 1,661 (90.1%) occupied housing units in the Borough get their heat from utility gas (natural gas).

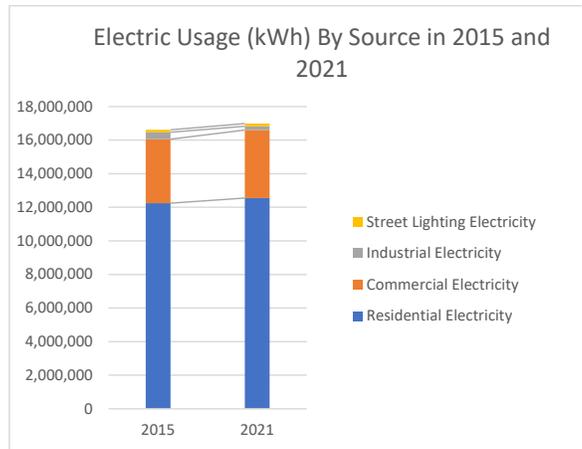
New Jersey Department of Community Affairs' Walkability Score map rates the neighborhoods generally southeast of 11th Street and southwest of Planten Avenue at 91% to 100% based on population density, job density, and the percentage of the population that reported walking to work in the 2020 5-year ACS survey. Having a high level of walkability is a significant foundation for a municipality to reduce and maintain low VMT, as it indicates that an area has a relatively low reliance on vehicles for daily activities.

According to NJ DEP's Solar Generation Potential mapping tool, nearly the entire Borough meets conditions that are desirable or appropriate for solar infrastructure.

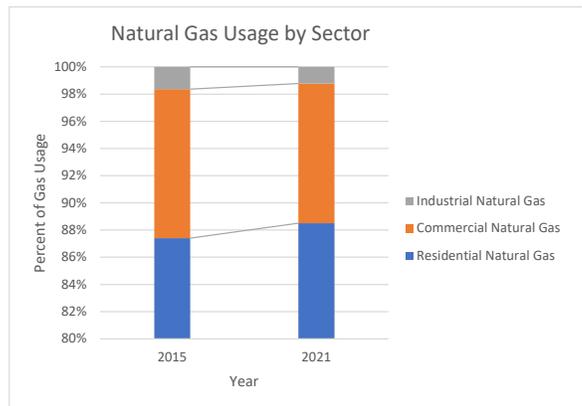
ACTIONS TO DATE, AND POTENTIAL OPPORTUNITIES

**ACTIONS TO DATE**

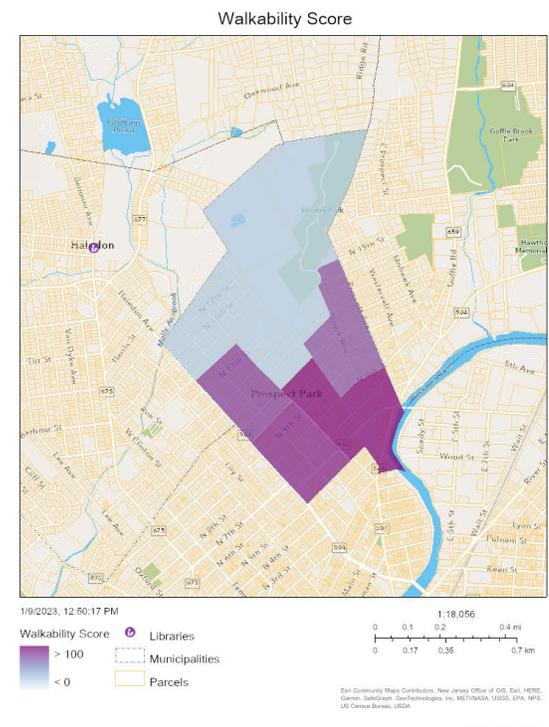
- ▶ Prospect Park recently adopted an Electric Vehicle (EV) charging ordinance implementing the Model Ordinance published by the NJ DCA in 2021.
- ▶ The Borough has been working with PSE&G to replace all of its street lights, and expects to be the first municipality in the State to have all-LED street lights. LED lights are not only high-performing but also consume less energy and last longer, reducing waste directed to landfills.
- ▶ In 2023, the Borough government adopted a four-day workweek, which helps to reduce its carbon footprint by reducing VMT from commutes and energy usage to power and heat municipal buildings.



**Figure 4. Change in Electric Usage 2015-2021**



**Figure 5. Change in Natural Gas Usage**

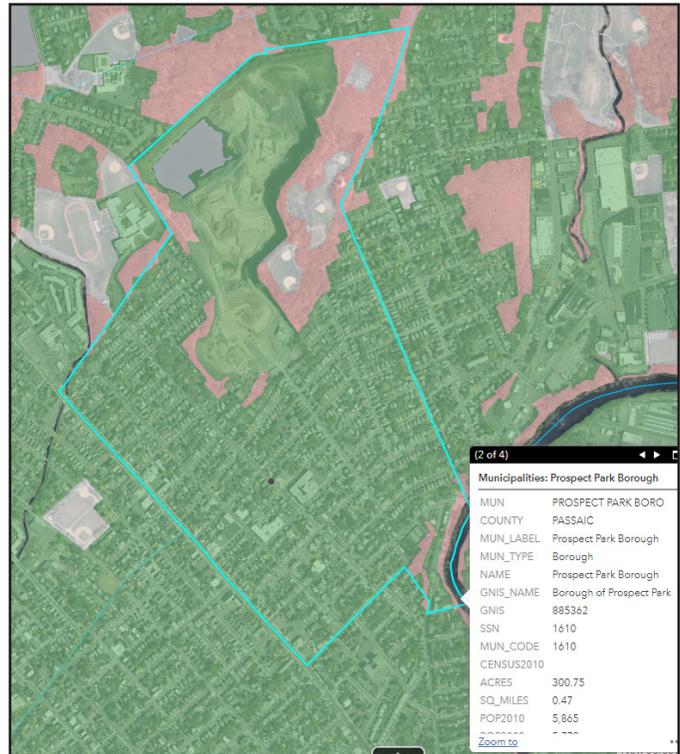


**Figure 6. NJ DCA Walkability Score Map for Prospect Park**

- ▶ The Borough is digitizing a number of its services and forms which reduces paper waste and improves government efficiency.

### OPPORTUNITIES FOR ENERGY IMPACT

- ▶ The 78.5-acre quarry in the northern half of the borough is the subject of a redevelopment plan that provides for substantial mixed-use development. As there is no redevelopment agreement in place, the Borough has an opportunity to amend the redevelopment plan for this property to require or permit renewable energy projects.
- ▶ The Borough has the opportunity to acquire a former gas station at the corner of 8th Street and Planten Avenue for surface parking, which may provide opportunities for solar canopies that could not only generate electricity for nearby residents or for EV charging stations, but would also help to reduce car emissions generated from idling to cool off or defrost in the summer and winter and help to reduce the urban heat island effect, which itself increases the energy needed to cool buildings in the summer.



Map 3. Screenshot from NJDEP Solar Siting Analysis Map (2017)

- ▶ The Borough has the opportunity to reduce vehicle miles traveled by Borough residents and workers by providing alternative means of access to nearby train and bus stations in neighboring Hawthorn, Paterson, and other municipalities. As with many of the initiatives explored in this Plan, such opportunity would require capital expenditures or partnerships with other governments or organizations in New Jersey to bring initiatives such as jitney services, bike shares, and the like within the Borough's reach.

### IDENTIFYING A LEADER

The most important decision the Borough should make to begin its community energy planning program is to identify the person, office, or body to lead the implementation of its Community Energy Plan. Sustainable Jersey recommends establishing a Green Team, composed of stakeholders from the governing body, municipal departments, advisory and decision making boards and committees, and (if appropriate) representatives from local non-profits and community organizations.

A Green Team allows the Borough to plan and implement its Community Energy Plan in an inclusive, open, and strategic manner. It is also beneficial if the Green Team is or works in close collaboration with a non-profit organization whose mission is to achieve for the Borough a specific level of sustainability, such as Sustainable Jersey Bronze or Silver Certification, or LEED Certified Cities, and which can take active action to promote local sustainability independently (such as outreach actions) and in collaboration with the Borough. The powers and responsibilities of the Green Team can be determined by the Borough.

### SUSTAINABLE JERSEY CERTIFICATION

Many of the initiatives described in this CEP correspond with one or more "Actions" toward municipal certification through Sustainable Jersey as a Bronze or Silver community. The Action information sheets on the Sustainable Jersey website provide guidelines for implementing these actions in greater detail than this CEP.

## LOOKING BEYOND THE TEMPLATE

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The numbered initiatives explored in this Plan are based on the initiatives identified in the Work Template created jointly by Sustainable Jersey and NJ BPU, and are oriented around the direct relationship between energy end-users and utility providers like PSE&G. This Plan identifies a number of other actions not identified in the Work Template which can help the Borough, its residents, and its businesses reduce energy use from buildings and automobiles, including actions that encourage alternative modes of transportation and which reduce excess HVAC energy use related to the urban heat island effect. The Borough should not view this document as the limit to the ways it can use its zoning, regulation, and investment powers to impact local energy use.

## STRATEGY 1: REDUCE ENERGY CONSUMPTION AND EMISSIONS FROM THE TRANSPORTATION SECTOR

This strategy is focused on increasing adoption of electric vehicles among residents and in municipal and commercial/industrial fleets, and taking other actions that can reduce the Borough's transportation related energy use and greenhouse gas emissions. Transportation makes up 42% of emissions in New Jersey (per the NJ EMP) and 9% of an average household's budget based on 2019 Bureau of Labor Statistics data. Fleet vehicle fueling and maintenance cost the Borough over \$75,000 in 2022 and \$57,000 in 2021. Electric vehicles and charging infrastructure, provide a way to reduce these costs and emissions over time.

According to the U.S. Department of Energy's Alternative Fuels Data Center, the average annual emissions from driving a BEV 11,579 miles in New Jersey is just 1,636 pounds of CO<sub>2</sub> equivalent (lbs CO<sub>2</sub>e) compared to 12,594 lbs CO<sub>2</sub>e from a gasoline powered car. New Jersey's EV CO<sub>2</sub>e emissions are significantly lower than the national average due to New Jersey's cleaner electric fuel portfolio. ICE vehicles and HEVs have the same emissions in every state, as gasoline is the same across the United States.

While they tend to have a somewhat higher up-front price tag, electric vehicles have lower fueling and maintenance costs than ICE vehicles, with a typical payback period of less than five years for vehicles averaging above 15,000 miles per year.

Municipalities can reduce GHG emissions from the transportation sector by electrifying municipal fleets supporting the adoption of electric vehicles for residential and commercial use. Prospect Park plans to explore the installation of public EV Charging infrastructure and conduct an outreach campaign to create awareness of the incentives available from the State toward the purchase of electric vehicles for residents and commercial fleets.

Prospect Park has already incorporated the Statewide electric vehicle charging station requirement into its municipal code, which requires a portion of the parking from new development or major use changes to be equipped for electric vehicle charging.

The specific Strategy 1 Initiatives to be pursued by the Borough include the following:

- ▶ **1.4 Purchase Alternative Fuel Vehicles** - Replace existing municipal fleet vehicles with plug-in hybrid, battery electric, or other sustainable alternative fuel vehicles, using fleet analysis to inform purchases.
- ▶ **1.5 Improve Municipal Fleet Efficiency** - Coordinate the strategic replacement (or retirement) of vehicles, scheduling of preventative maintenance, and improvement of driver efficiency to reduce the GHG footprint of all municipal fleets – public works, police, fire, etc. Requires tracking of fleet data such as age of vehicles, duty cycle, and use patterns.
- ▶ **1.6 Install Public EV Charging Infrastructure** - Install electric vehicle charging infrastructure, including chargers, signage, and safety and accessibility features, for public use.

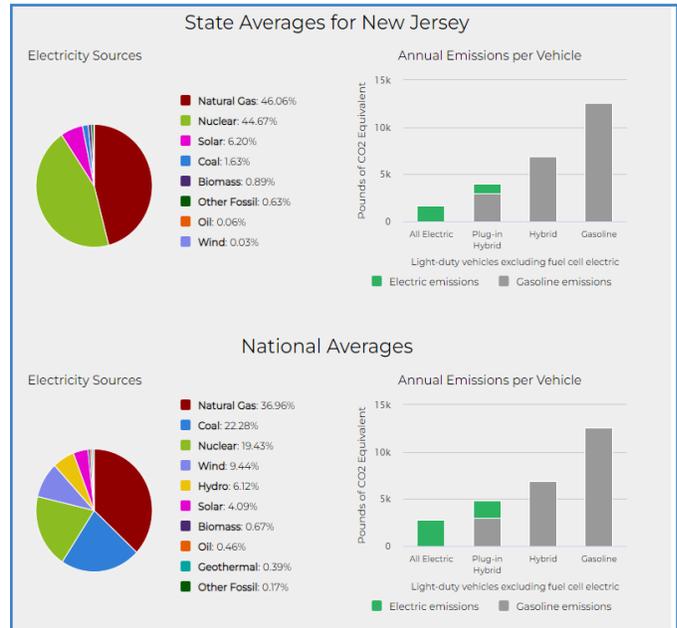


Figure 7. CO<sub>2</sub>e emissions by vehicle fuel type in New Jersey and Nationally

#### 1.4 PURCHASE ALTERNATIVE FUEL VEHICLES

Replacing older fleet vehicles with newer alternative fuel vehicles can reduce municipal climate impact and costs associated with vehicle upkeep and fueling. The moment that a vehicle no longer serves its purpose or becomes a burden to maintain is a “leverage point” - an opportunity that can be leveraged to make a greater impact - to change energy usage patterns.

Replace existing municipal fleet vehicles with plug-in hybrid, battery electric, or other sustainable alternative fuel vehicles, using fleet analysis to inform purchases.



**“Purchase Alternative Fuel Vehicles” Action**

**“Meet Target for Green Fleets” Action**

Prospect Park’s municipal fleet includes:

- ▶ Nine (9) police sedans and SUVs
- ▶ One (1) first-aid squad ambulance
- ▶ Eight (8) public works vehicles including a sweeper, a dump truck, a plow, a truck cab, a recycling truck, and three (3) pick-up vehicles
- ▶ One (1) parks department bus
- ▶ Seven (7) fire department vehicles including four (4) fire suppression and rescue vehicles and three (3) SUVs or pick-ups
- ▶ One (1) sedan used by the administrator
- ▶ One (1) sedan used by the office of emergency management

Vehicle ID	Year	Make	Description/Model	VIN (Last 5 Digits)	Group	Department	Secondary Dept.
1997	FORD		AMBULANCE	13301	Group II	First Aid Squad	FIRST AID
1991	CHEVROLET		CAPRICE	47866	Group I	Emergency Management	DEM
1995	SPA		FIRETRUCK	16987	Group III	Fire	FIRE
2015	Ford		Police Interceptor Sedan	1FAHP2MK7FG162011	Group I	Police	Police
1992	CHEVY		CAPRICE	54390	Group I	Administration	ADMIN
2006	JEEP		CHEROKEE	77823	Group I	Fire	FIRE
2013	FORD		EXP	84567	Group I	Police	POLICE
1998	Ford		Bus	60466	Group V	Parks and Recreation	Recreation
1994	INTERNATIONAL		DUMP	73276	Group II	Public Works	DPW
2004	FORD		F450	58381	Group I	Public Works	DPW
2009	INTERNATIONAL		SWEEPER	55733	Group III	Public Works	DPW
2001	FORD		F350	35686	Group I	Public Works	DPW
2004	INTERNATIONAL		4400 RESCUE TRUCK	15701	Group IV	Fire	FIRE
2005	DODGE		DURANGO	12521	Group I	Fire	FIRE DEPT
2013	FORD		F350	46902	Group I	Public Works	DPW
2001	SEGRAVE		FIRE TRUCK	T2019	Group II	Fire	FIRE
2008	DODGE		DURANGO	21429	Group I	Police	POLICE
1995	FORD		F-SERIES RECYCLE	4457	Group I	Public Works	DPW
2008	FORD		GROWN VICTORIA	68752	Group II	Police	POLICE
2017	Ford		Interceptor Utility	86370	Group I	Police	POLICE
2018	Chevrolet		Tahoe	27476	Group II	Police	Police
2018	Chevrolet		Tahoe	27396	Group II	Police	Police
2021	international		HV507 SFA 4x4	36295	Group III	Public Works	
2020	Ford		Explorer	68044	Group I	Police	
2020	Ford		XSH9/PU w/plow	63421	Group II	Public Works	
2007	Ford		P71	14417	Group I	Building	
1995	Spartan		Pumper GA41M-2142	21348	Group III	Fire	
2022	Ford		Explorer	45772	Group I	Police	
2022	Ford		Explorer	45758	Group I	Police	

Figure 8. Current Borough Vehicle Fleet

As of this writing, the model years of municipal vehicles range from 1991 to 2022. The Police Department vehicles tend to be newer, with the oldest vehicles being two (2) 2008 models and the newest vehicles being one 2020 and two 2022 Ford Explorers. The oldest two vehicles are 1991 and 1992 Chevrolet Caprice sedans used by the Office of Emergency Management and Administration departments.

The next oldest vehicles in the Borough's fleet are specialized vehicles that may be less immediately available in electric form. Medium and heavy duty vehicles do exist as Battery-Electric or Plug-In Hybrid Electric Vehicles, and are particularly suitable for electric replacement where the vehicle's function provides enough downtime between uses to fully charge (such as a street sweeper, refuse truck, or school bus). The up-front cost for such vehicles can be substantially more than that of their gasoline or diesel fueled counterparts; therefore, the lifetime costs of the vehicle with respect to maintenance and charging should be taken into consideration.

The decision as to which vehicles the Borough should prioritize for replacement should include the following:

- ▶ **Current maintenance costs of existing ICE vehicle** - Vehicles with the highest fueling and maintenance costs should among the first targets for comparable EV replacement;
- ▶ **Rate of usage** - The payback period for an EV (the amount of time it takes for the savings in fuel and maintenance costs to exceed the cost difference between the EV and its internal-combustion equivalent) is highest for vehicles with the highest rate of usage. Vehicles that rack up the most miles each year should be among the first targets for comparable EV replacement.
- ▶ **Type of usage** - Vehicles whose daily uses include long idling periods (such as a police car or bus) or frequent stop-and-go patterns (such as a garbage truck or school bus) are great candidates for electric replacement as those use patterns are most wasteful in ICE vehicles;
- ▶ **Available electrified alternatives** - The Borough should evaluate the costs and reliability of available electric alternatives against newer ICE or HEV models.

- ▶ **Grid and electric system compatibility** - *The Borough should ensure that it is able to install the necessary EVSE at appropriate facilities to charge the EV replacement vehicle to at least 80% charge between uses.*
- ▶ **Plans for On-Site Solar** - *The Borough can get the most out of its investment in EVs and in renewable energy if it electrifies fleet vehicles that will be charging at facilities that are targeted for on-site solar installations, as the vehicles could essentially charge for free using energy generated on-site from the solar array.*

The Borough may find that it is more economically practical to contract with a vehicle conversion professional to convert current fuel-based fleet vehicles to BEV or PHEV. Such conversions replace or supplement the ICE engine with an battery and/or motor.

### FINANCIAL INCENTIVES AND SAVINGS

- ▶ At the time of this writing, the New Jersey Clean Fleet EV Incentive Program through New Jersey Clean Energy offers \$4,000 grants toward the purchase of BEVs, with a cap of 4 EVs in a grant period for areas with populations of less than 20,000 persons.
- ▶ Dealers who sell electric vehicles to municipalities are able to claim a tax credit of between \$2,500 and \$7,500 and pass those savings on to the purchasing municipality.
- ▶ NJ DEP offered grants between 2020 and 2022 to assist up to 16 municipal projects to replace diesel powered medium and heavy-duty vehicles, such as school buses, garbage trucks, and the like, with electric alternatives using funds from the Regional Green House Gas Initiative (RGGI). The deadline for applications was in March of 2022 – however, the Borough should monitor whether that program or an alternative program is revived in 2023 or beyond.
  - ▶ In 2023, the State will launch the NJ ZIP program – a \$90 million voucher program to provide between \$20,000 and \$175,000 in assistance to acquire a new zero-emission vehicle. Base voucher amounts will depend on vehicle class; however, overburdened communities are eligible for a 10% increase in voucher value, and there is a 25% increase available for school buses.
- ▶ NJ Municipalities are also eligible for sale tax exemptions for new or used Zero Emission Vehicles (ZEVs) sold, rented or leased in the State.
- ▶ Prospect Park can advocate for or join a collaborative of municipalities and agencies in Passaic County to collectively bid for electric vehicles in order to achieve a discounted rate.

The Borough will need to assess the usage and maintenance patterns of their vehicles against the available incentive programs to determine which programs offer the greatest payoff.

### OBSTACLES AND BARRIERS

Some of the obstacles and barriers that the Borough may face in this initiative include:

- ▶ The supply of electric vehicles at the time of this writing is constrained due to global supply chain issues; consequently, costs are also much higher than might be under normal conditions;
- ▶ Many EVs are ineligible for tax credits or grants, as the Federal tax credits prefer vehicles with final manufacture in the United States;
- ▶ Specialized vehicles like fire and garbage trucks may be less available and more expensive than their gas counterparts; however, the oldest municipal vehicles generally fall into this category;
- ▶ Department Heads or fleet drivers may be skeptical of alternative fuel options;
- ▶ State laws may restrict the types of vehicles the Borough can purchase.

## NEXT STEPS

1. The Borough Administrator or their designee will coordinate with the heads of departments with assigned fleet vehicles and ask them to report on the condition of their respective vehicles, the costs of maintaining and fueling those vehicles, and information such as odometer readings, actual gas mileage, and other available data reflecting the condition and efficiency of the vehicle.
2. The Borough Administrator or designee, consultant, or committee (such as the Green Team) will review the data and compare maintenance and fueling costs of current vehicles to those of a new electric vehicle using one or more of the numerous cost comparison tools available from government and research entities (detailed at the end of this chapter).
  - a. Alternatively, the Borough will consider targeting a specific department for vehicle replacement, as this will also allow the Borough to target a single facility to equip with EVSE charging equipment in one grant cycle.
  - b. The cost comparison should account for grants, rebates, and discounts the Borough may be able to receive for the electric vehicles.
3. The Borough will aim to replace a number of vehicles up to the maximum number eligible for grants.
4. The Borough will aim to time its vehicle electrification efforts at the same time as its solicitations for municipal on-site solar installations, so that it can account for the potential savings from charging fleet vehicles with solar energy.
5. Upon identifying vehicles for replacement, the Borough will confirm which vehicles are eligible for grants and tax credits, as well as which vehicles they are able to buy under State or Federal law;
6. The Administrator or their designee will secure an electric vehicle vendor and EVSE installation professional;
7. Finally, the Borough Administrator or their designee will submit grant applications.

### 1.5 IMPROVE MUNICIPAL FLEET EFFICIENCY

The Borough can take a number of actions to make its fleet more efficient beyond electrifying its vehicle fleet. These include:

- ▶ **Idle Reduction Technology** - *Installing Idle reduction equipment into fleet vehicles that are expected to remain in operation for at least five years. Idle reduction equipment temporarily shuts off a vehicle's engine while idling while powering electronic devices like air conditioning and audio at full or reduced performance on battery power. An "Idling Reduction Savings Calculator" worksheet is included in the appendices to this Plan. ;*
- ▶ **Behavior Changes** - *Training or educating police, public works, and other municipal personnel on efficient driving and idling practices;*
- ▶ **Low Rolling Resistance Tires** - *According to the US Department of Energy, "Rolling resistance is the energy lost from drag and friction of a*

*Coordinate the strategic replacement (or retirement) of vehicles, scheduling of preventative maintenance, and improvement of driver efficiency to reduce the GHG footprint of all municipal fleets – public works, police, fire, etc. Requires tracking of fleet data such as age of vehicles, duty cycle, and use patterns.*



### "Fleet Inventory" Action

#### Note 1. Idle Reduction Types

University of Massachusetts, Amherst, Center for Agriculture, Food, and the Environment, identifies these types of IRT:

- **Idle Limiter** – The simplest form of IRT, this mechanism turns a vehicle's engine off after it has been idling for a predetermined period of time.
- **Electronic Stop/Start System** – An electronic device that monitors vehicle battery levels while the engine is off, but appliances are in use. Once battery levels drop below a certain point, the device turns the engine on for a set amount of time to recharge the battery, and

tire rolling over a surface. The phenomenon is complex, and nearly all operating conditions can affect the final outcome. Conventionally fueled passenger vehicles use about 4%–11% of their fuel just to overcome tire rolling resistance. All-electric passenger vehicles can use approximately 25% of their energy for this purpose. For heavy trucks, this quantity can be as high as 30%–33%. A 10% reduction in rolling resistance would improve fuel economy approximately 3% for light- and heavy-duty vehicles. Installing low rolling resistance tires can help fleets reduce fuel costs. It's also important to ensure proper tire inflation." Establishing a Borough-wide policy to only replace fleet vehicle tires with low rolling resistance tires can help to reduce fuel consumption for medium and heavy-duty internal combustion vehicles.

then turns the engine off again.

- Auxiliary Power Unit (APU) – A small secondary power source that allows a vehicle's electronic appliances to be used when the primary engine is not running. APUs can be powered using the vehicle's main fuel supply, a small separate fuel tank, alternative fuel, rechargeable batteries, or rooftop solar panels.
- Fuel Operated Heater (FOH) and Battery Air Conditioning System (BAC) – Small independent heating and cooling systems. FOHs can operate on a range of fuels, including gas, diesel, and alternative fuels. BACs are powered with rechargeable batteries, which can be charged by the engine while it is running, or by rooftop solar panels. These two systems are frequently utilized together.
- Plug-in Hybrid Systems – Rechargeable battery systems can be installed to run power take-offs, bucket truck lifts, dump truck hydraulics and other truck equipment, even when the engine is off."

- ▶ **Vehicle Replacement Schedule** - Establishing standards across municipal departments to determine when fleet vehicles should be replaced. Criteria should include cost of maintenance relative to replacement, performance issues, costs to fuel, and the like. Vehicle performance and condition should be assessed annually or more frequently in order to account for new vehicle acquisition in the annual budget.
- ▶ **Speed Control Modules** - Contract with an appropriate vendor to set speed limits on non-emergency vehicles to prevent vehicles from driving inefficiently. According to the US Department of Energy, every 5 MPH over 50 MPH on a light duty vehicle equates to costing an additional \$0.25 per gallon of fuel. That amount varies by vehicle type and age.
- ▶ **Replace Older Vehicles with Hybrid-Electric Vehicles** - There may be instances where it is more beneficial to replace older vehicles with hybrids. However, hybrids are not currently eligible for rebates or tax credits.
- ▶ **Convert Newer Vehicles to Alternative Fuels** - Vehicles that are too new to be replaced can be converted to HEVs or to accept alternative fuels.
- ▶ **Select Smaller Vehicles Where Available** - Lighter weight vehicles use less fuel and can often meet the same needs as their larger counterparts (consider, for example, a Ford Escape instead of the larger Ford Explorer).

## OBSTACLES AND BARRIERS

The most significant obstacle to making the Borough's fleet more efficient through interventions such as those listed above will be buy-in from Department Heads or fleet drivers.

## NEXT STEPS

1. The Borough Administrator, their designee, and/or the Green Team will meet with relevant department heads and vehicle maintenance personnel to identify fleet efficiency solutions that are most achievable and appropriate each department's needs and capabilities.
2. The Green Team will work with Department heads to post fuel-efficiency literature in common areas used by fleet driving personnel;
3. When replacement of existing vehicles with electric options or conversion of existing vehicles to electric or plug-in electric propulsion is not feasible, the Borough will investigate installing fuel-efficiency

improvement technologies into newer existing vehicles or replace older vehicles with more fuel efficient alternatives.

**1.6 INSTALL PUBLIC EV CHARGING INFRASTRUCTURE**

The Borough owns its Borough Hall at 106 Brown Avenue which also includes its Police Department and second fire house company, and it also owns its DPW building at 162 North 13th Street. The Main Borough Fire House on Fairview Avenue is leased to the Borough.

At the time of this writing, the Borough is in the process of acquiring a former gas station at the intersection of 8th Street and Planten Avenue, which it is considering for creation of a surface parking lot.

At the time of this writing there is no existing public electric vehicle infrastructure in the Borough. The nearest EV charging stations are approximately two miles away in Wayne Township and Hawthorne Borough. Both the public and Borough government can benefit from the installation of EVSE at current and anticipated Borough-owned properties are excellent opportunities for. Additionally, all of the Borough properties existing buildings and electrical connectivity, which reduces barriers to EVSE installation.

**TYPES OF EVSE**

The type of EVSE to be installed will depend on the fleet’s needs and the current and potential capability of the site’s electrical systems. There are three basic categories of EVSE based on the maximum amount of power the charger provides to the battery. See “Note 2. Typical EVSE Charger Levels” on page 24.

Level 1 charging may be sufficient for employee parking areas, as they can charge 16 to 40 miles of driving in an 8-hour work day based on the 2 to 5 miles of range per hour stated in the previous section, and even for fleet vehicles with substantial downtime between uses. Level 2 and DCFC chargers are ideal for vehicles that drive many miles per day and/or have minimal downtime between uses, such as emergency vehicles or public users who are charging their vehicles while shopping, dining, or using a public or private service.

Public charging stations with DCFC or Level 2 charging should be located in public areas where EV users are likely to leave their vehicles for at least 30 minutes. These include Hofstra Park, the proposed public parking lot at Planten Avenue and 8th Street - which would likely serve patrons of businesses on 8th Street, or as on-street parking in close proximity to churches - such as at the corner of Haledon Avenue and North 9th Street.

**NETWORKED VERSUS NON-NETWORKED CHARGERS**

In addition to the power level categories, EVSE come in “networked” and “non-networked” formats. Networked

*Install electric vehicle charging infrastructure, including chargers, signage, and safety and accessibility features, for public use.*



**“Public Electric Vehicle Charging” Action**

**Note 2. Typical EVSE Charger Levels**

As summarized by the Delaware Valley Regional Planning Commission:

- “Level 1: Provides charging through a 120 V AC plug and does not require installation of additional charging equipment. Can deliver 2 to 5 miles of range per hour of charging. Most often used in homes, but sometimes used at workplaces. Level 1 charging at home or work may be able to provide adequate charging for most commuters.
- Level 2: Provides charging through a 240 V (for residential) or 208 V (for commercial) plug and requires installation of additional charging equipment. Level 2 can deliver 10 to 20 miles of range per hour of charging. Used in homes, workplaces, and for public charging.
- DC Fast Charging (DCFC): Provides charging through 480 V AC input and requires highly specialized, high-powered equipment as well as special equipment in the vehicle itself. DCFC can deliver 60 to 80 miles of range in 20 minutes of charging. Used most often in public charging stations, especially along long-distance traffic corridors. The cost for DCFC generally makes it too expensive for everyday use. Note that if you think you may need to use DCFC, be sure that the vehicle you purchase has fast charging provisions installed. For some vehicles this is an option. For the 2021 Chevrolet Bolt, this option has an MSRP of \$750. Plug-in hybrid electric vehicles typically do not have fast charging capabilities.”

EVSE have a higher up-front cost and costs for the benefit of being connected to a telecommunications network, but also provide benefits such as allowing fleet managers to monitor charging activity or for the municipality to payments for public charging through a program membership. Non-networked chargers can also accept payment through credit cards and other traditional forms of payment.

Municipal and private hosts of networked charging stations have reported that costs of networked chargers significantly exceed their benefits. Prospect park is not likely to experience significant public EV charging activity, as the Borough does not have a major regional attraction such as a shopping mall, theater, or highway rest stop, nor is the Borough's demographic likely to adopt electric vehicles at a substantial volume in the near future. Therefore, this Plan does not recommend utilizing networked charging stations.

### FINANCIAL INCENTIVES AND SAVINGS

At the time of this writing, the New Jersey Clean Fleet EV Incentive Program through New Jersey Clean Energy offers \$4,000 grants toward the purchase of fleet Level 2 EV Charging Stations and \$5,000 grants toward public Level 2 EV Chargers, with a limit of 2 charging stations in a grant period for areas with populations of less than 20,000 persons. Up to \$50,000 may also be available for one DCFC charging stations. Overburdened municipalities like Prospect Park are eligible for an additional 50% bonus to be provided in the form of either additional funding or additional eligible chargers. The Borough may also be eligible for additional rebates from PSE&G for DCFC infrastructure installation. EV charging equipment is also eligible for a 30% tax credit (Alternative Fuel Vehicle Refueling Property Credit), further reducing the costs to the Borough.

### NEXT STEPS

1. The Borough will conduct feasibility studies into installing EVSE at municipal facilities based on:
  - a. Fleet vehicles prioritized for electrification; and/or
  - b. Facilities prioritized for on-site renewable energy installation; and/or
  - c. A Borough parking facility or public right-of-way which is most visible and accessible to persons who are likely to park for at least 30 minutes at one time. The Borough will also explore the option of entering into an agreement with a business on 8th Street to install EVSE on their property(ies) at the Borough's expense; and
  - d. The Borough will use its partnership with Munisite Networks to attach EVSE to new telecommunications monopoles.
2. The DPW Superintendent will assess the capacity of the prioritized Borough facilities' electrical systems and estimate the costs of upgrading those systems to service EVSE.
3. The Borough will review grant application processes to ensure that it is capable of completing the application on time and implementing the EVSE installation upon receiving the grant(s);
4. The Borough Administrator and CFO will initiate the appropriate purchasing process;
5. Following installation, the Borough should monitor usage of the EV charging facilities to assess the success of the initial installation and determine the most effective strategies for future installations.

### OTHER RESOURCES AND STRATEGIC CONSIDERATIONS

There are a number of resources available to the Borough to identify available and affordable options for EVs and EVSE infrastructure, including, but not limited to, the following.

- ▶ Climate Mayors, an organization of Mayors committed to climate resilience and responsibility, hosts a website called DriveEVFleets.org, which identifies EV fleet vehicle and EVSE vendors and models, and provides guidance and model documents for entities attempting to electrify their fleets. The Climate Mayors Vehicle Purchasing Collaborative is an effort by member municipalities "to leverage the buying power of the member cities to reduce the costs of EVs and charging infrastructure for all U.S. cities, counties, courts, school districts, state governments, and public universities, thereby



bus-only maneuvering lane in order to provide buses with adequate curb length to pick-up and drop-off passengers without blocking traffic and/or to provide opportunities for buses to bypass on the right vehicles held at a stop light in order to allow for drop-off and pick-up operations while the light is red.

OTHER OPPORTUNITIES: FACILITATE ACTIVE TRANSPORTATION

Similar to the above, the Borough can reduce vehicle miles traveled by improving safety for pedestrians and other small vehicle (bike, scooter) users on local roads. Most local streets have striped street-parking spaces along both curbs. While this may promote safe and efficient street parking patterns, it makes it more difficult for bicyclists and cars to share the road. Wagaraw Road, which provides the most direct connection from Prospect Park to the Hawthorne Train Station, contains a bicycle lane for part of its extent through Hawthorne. The Borough should conduct an audit of the use of its on-street parking spaces and consider strategically replacing on-street spaces to create a dedicated bike lane network through the Borough which would link to Goffle Road and eventually Wagaraw Road, to make biking to Hawthorne Station safer and more inviting.



**“Bicycle and/or Pedestrian Path” Action**

OTHER OPPORTUNITIES: BUS-ORIENTED DEVELOPMENT

The Borough could target the areas of the Borough along the 744 bus line for up-zoning or redevelopment to encourage higher density near the bus line. Additionally, the Borough should work with Neighboring Haledon Borough, Paterson, and Passaic County to upgrade Haledon Avenue (Route 504) to a “complete street” with dedicate bus, bike, and car lanes in order to improve bus efficiency, likely at the cost of losing street parking spaces.



**“Transit-Oriented Development Supportive Zoning” Action**

OTHER OPPORTUNITIES: REDUCE WASTE COLLECTION BURDEN

Encourage residents to compost their food and yard waste for gardening and lawn maintenance. This will help to reduce the amount of waste hauled by garbage and leaf collection vehicles and therefore reduce the fuel needed to propel those vehicles. Composting can also be used by apartment dwellers who do not have lawns.

## STRATEGY 2: ACCELERATE DEPLOYMENT OF RENEWABLE ENERGY AND DISTRIBUTED ENERGY RESOURCES

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The goal of Strategy 2 is to expand the adoption of solar-generated electricity and other forms of microgeneration by the Borough and by Borough residents and businesses. Actions include adopting ordinances to remove barriers to private and community solar projects, installing solar energy systems on Borough properties, and reducing obstacles to accessing clean energy, particularly among the Borough's LMI residents.

A core component of the success of Strategy 2 is a type of program called community solar. Solar energy installations come in a few different forms. Private solar, such as rooftop panels installed on a home or a warehouse, provide on-site electricity and sell whatever is left over to the grid, providing a credit on the property-owner's utility bill. Utility providers, such as PSE&G, can also install solar energy systems which contribute to the total grid electric production. Community solar is a system in which a property owner can develop solar energy infrastructure on their property, or lease land or roof area to another party to develop the infrastructure, and allow residents and businesses to subscribe to a portion of the energy generated, which is credited to their utility bill proportionate to the amount of solar energy that they have subscribed to.

The specific Strategy 2 Initiatives to be pursued by the Borough include the following:

- ▶ **2.1 Adopt Supportive Zoning and Permitting for Private Solar** - Provide clear guidance/standards for solar developers and limit barriers to solar adoption such as lengthy permitting and multiple reviews.
- ▶ **2.2 Post Solar Permitting Checklist** - Provide clear guidance/standards for solar developers with a permitting checklist that can be easily found on the municipality's website. Solicit feedback from users and revise checklist based on comments.
- ▶ **2.3 Adopt Zoning and Permitting for Community Solar** - Update municipal zoning ordinances to specifically allow large-scale solar projects, and designate future community solar sites as redevelopment zones. Consider offering direct assistance with permitting, expediting the permitting process, and/or reducing permitting fees for community solar.
- ▶ **2.4 Train First Responders on Solar** - To further public confidence and maintain emergency preparedness, require training on solar infrastructure for first responders.
- ▶ **2.5 Train Non-Emergency Staff on Solar** - To ensure municipal staff can efficiently and effectively inspect, review, permit, etc. solar installations in the community, require training on solar infrastructure for all relevant staff.
- ▶ **2.6 Install On-Site Municipal Renewable Generation** - Host a solar, wind, or geothermal project on municipal property to generate renewable energy for municipal facilities. Such projects can be leased from a developer or purchased and owned outright.
- ▶ **2.7 Buy Renewable Energy for Municipal Facilities** - Buy renewable electricity for municipal facilities directly from a green energy supplier or participate in a buying pool that supplies electricity with high renewable content. The accompanying renewable energy certificates (RECs) should be certified as PJM Class I.
- ▶ **2.8 Offer a Solar Employee Benefit Program** - Offer a collective solar purchasing program for municipal employees, promoted via existing employee communication network. This type of program utilizes scale and low customer acquisition costs to make installing solar more affordable for participating employees. Schools and municipalities can collaborate to form a larger pool of potential customers, even including student families in the offer.
- ▶ **2.9 Institute a Community-wide Solar Purchasing Program** - Partner with solar installers or a solar marketplace to offer special pricing on solar installations to residents and/or businesses for a limited

time. Establish the partner solar installer(s) and special pricing via RFP process, then advertise the offering to the community. Alternatively, partner with a competitive online solar marketplace to offer residents a custom online webpage to receive quotes.

- ▶ **2.13 Host a Community Solar Project on Municipal Property** - Host a community solar project on municipal property, such as a DPW garage, parking lot/garage, or landfill. Most municipalities lease the site to the developer or enter a power purchase agreement (PPA) with the developer to buy the electricity at a reduced rate.

## 2.1 ADOPT SUPPORTIVE ZONING AND PERMITTING FOR PRIVATE SOLAR

The Borough will ensure that private solar is clearly permitted as an accessory use in the Borough, and limit regulatory language to reduce unnecessary barriers like added costs and outdated technological standards.

Provide clear guidance/standards for solar developers and limit barriers to solar adoption such as lengthy permitting and multiple reviews.



### “Make Your Town Solar Friendly” Action

A supportive zoning ordinance for private solar

infrastructure will establish only the minimum necessary standards to protect public health, safety, and welfare. Sustainable Jersey publishes a document entitled “Guidance for Creating a Solar Friendly Zoning Ordinance” which outlines the “Dos” and “Don’ts” of drafting ordinances surrounding solar. Some of key takeaways of this are:

- ▶ The ordinance should avoid setting standards or definitions specifying types of technology, models, standards, or electrical sizes as they may become outdated or may not be applicable to all situations;
- ▶ The ordinance should not be overly burdensome, such as requiring site plan approval for all solar equipment. For example, solar facilities should not be conditional uses.
- ▶ Permitting fees for solar installations should be minimal and should not exceed fees established in N.J.A.C. 5:23-4.20(c)2.iii(13).
- ▶ The guide includes ordinance-friendly definitions which Sustainable Jersey believes will minimize confusion or obstructions to solar proliferation.
- ▶ To the extent that the ordinance provides standards for solar facilities, the standards should be distinct for ground-mounted / freestanding versus roof-mounted equipment.
- ▶ Avoid abstract language regulating the visual impact of solar on a neighborhood.

The above referenced guidance document is contained in the appendices to this Plan.

Adopting a solar supportive ordinance is a quick, low-cost action that the Borough can take shortly after the adoption of this plan.

### OBSTACLES AND BARRIERS

The Borough should anticipate that members of the public may have concerns about the appearance of solar panels and their related equipment.

### NEXT STEPS

1. The Borough will authorize its Planner to review the Borough’s Master Plan to ensure that the Plan does not contain language which would discourage solar installations, and to draft an ordinance permitting private solar based on the guidelines from Sustainable Jersey and its sources.
2. The solar permitting ordinance will be reviewed by the Planning Board for Master Plan consistency, and then referred back to the Mayor and Council for adoption.

## 2.2 POST SOLAR PERMITTING CHECKLIST

Permitting checklists help both developers and the parties responsible for reviewing their development applications stay cognizant of the major requirements of municipal ordinances and policy documents. Solar permitting checklists help to reduce obstacles to residents and other solar installation applicants who are not familiar with development processes.

*Provide clear guidance/standards for solar developers with a permitting checklist that can be easily found on the municipality's website. Solicit feedback from users and revise checklist based on comments.*



### **"Make Your Town Solar Friendly" Action**

The Interstate Renewable Energy Council provides the following guidance for Application checklists:

- ▶ List required forms, such as building permit application form, and where they can be located
- ▶ List and describe required diagrams or plans, including the number of copies needed
- ▶ List any other required documentation, signatures or approvals
- ▶ Describe the fee structure and options for payment
- ▶ Provide online or in-person application submittal instructions
- ▶ Provide information about office hours, and appropriate staff contacts
- ▶ Include citations to relevant code or other sources as much as possible for the applicant to reference

And the following guidance for review-side checklists:

- ▶ List the information required in advance of the inspection
- ▶ List what the inspector will look at on-site and what requirements are expected to be met
- ▶ Consider dividing checklist into appropriate sections, such as utility service/AC power source, inverter, arrays/modules, and grounding/bonding
- ▶ Explain who needs to be there and what applicant can expect during the inspection
- ▶ Provide information about office hours, and appropriate staff contacts
- ▶ Include citations to relevant code or other sources as much as possible for the applicant to reference

An example of the Boulder, CO solar permitting checklist is included in the exhibits to this plan.

### **NEXT STEPS**

1. The Borough will authorize its Planner to work with its construction and zoning officials to prepare a checklist corresponding to the solar ordinance and other Borough codes, and meeting the guidelines from Sustainable Jersey and its sources.
2. The checklist will be adopted by the appropriate means and posted in a public location and on the Borough's website.

## 2.3 ADOPT ZONING AND PERMITTING FOR COMMUNITY SOLAR

This initiative is similar to the prior two and, in fact, may be adopted simultaneously with the general solar permitting ordinance and checklist. Zoning and permitting for community solar differs from those for solar mounted on private properties for private purposes in a few ways:

*Update municipal zoning ordinances to specifically allow large-scale solar projects, and designate future community solar sites as redevelopment zones. Consider offering direct assistance with permitting, expediting the permitting process, and/or reducing permitting fees for community solar.*



### **"Municipally Supported Community Solar" Action**

- ▶ Private solar projects are developed at the scale needed to offset electric demand on

that property, whereas community solar projects are developed at a scale to offset electric demand for multiple properties;

- ▶ Private solar is an accessory use to a residence or business whereas community solar may be seen as a principal use in that it is used to generate revenues for the property owner or lessee of the solar-mounting surface.

The principles for adopting solar friendly zoning and permitting are generally the same for community solar as for private solar – avoid language that may become obsolescent and avoid creating unnecessary standards or permitting steps.

Because community solar takes place at a larger scale than private solar (typically), and because there is an incentive by the developer to maximize that scale to serve more customers, it may be appropriate for the Borough to establish separate and more stringent regulations for community solar projects than for private solar installations; primarily setback limits to residential properties, screening, and security.

The Borough can maximize the benefits of community solar on private properties by permitting community solar installations as a principal use in a designated redevelopment or rehabilitation area, as the development experiences a lessened tax burden through a Payment in Lieu of Taxes (PILOT) or a 5-year tax abatement, which can then be passed through to customers.

Some of the largest rooftops in the Borough are on privately owned properties being used for commercial or industrial purposes. These include:

- ▶ **265 North 9th Street (Block 35, Lot 1)** - Estimated by Google Project Sunroof to have 22,974 square feet of available roof area;
- ▶ **241-248 North 10th Street (Block 31, Lot 1)** - Estimated by Google Project Sunroof to have 16,808 square feet of available roof area;
- ▶ **316 North 6th Street (Block 50, Lot 41)** - Estimated by Google Project Sunroof to have 16,685 square feet of available roof area;
- ▶ **320 North 6th Street (Block 50, Lot 40)** - Estimated by Google Project Sunroof to have 12,386 square feet of available roof area;

In addition to adopting zoning to permit community solar, the Borough could reach out to the owners of these properties to explore a joint effort to utilize their rooftops for community solar projects.

A discussion of community solar installations on Borough or Board of Education properties is located later in this chapter.

## **OBSTACLES AND BARRIERS**

The ordinance permitting community solar installations may need to reconcile any public concerns or perceptions of large-scale solar installation, such as through appropriate setbacks or screening requirements.

## **NEXT STEPS**

1. The Borough will authorize its planning consultant to amend the Borough's zoning ordinance to permit community solar as a principal permitted or conditional use on private properties.
2. The Borough will also authorize its consultant to conduct redevelopment investigations of municipally owned properties to be considered for community solar in order to determine if those properties are eligible for designation as an area in need of redevelopment and to adopt a redevelopment plan permitting community solar, in accordance with N.J.S.A. 40A:12A-1 et seq.
3. The Borough will amend its Quarry Area Redevelopment Plan to permit large-scale solar, and may also incentivize community solar as a component of any redevelopment project through increased densities or building heights, relaxed parking standards, and the like.

Due to the densely developed nature of the Borough, any private community solar projects outside of any existing vacant land or proposed redevelopment areas would be limited to commercial rooftops and/or large, open parking lots. The Borough should conduct outreach to the owners of the properties identified above to secure partners them as partners in the creation of community solar installations in the Borough.

2.4 TRAIN FIRST RESPONDERS ON SOLAR / 2.5 TRAIN NON-EMERGENCY STAFF ON SOLAR

The Borough's personnel responsible for emergency response or for inspecting and permitting solar installations may not be familiar with solar energy systems. The Borough can require training for these staff on how to address this technology, in order to ensure the safety of Borough residents and workers. Such training programs are offered by a number of institutions for use by municipal staff in various roles.

To further public confidence and maintain emergency preparedness, require training on solar infrastructure for first responders.

To ensure municipal staff can efficiently and effectively inspect, review, permit, etc. solar installations in the community, require training on solar infrastructure for all relevant staff.

Sustainable Jersey identifies three providers for training courses for municipalities to consider:



**“Make Your Town Solar Friendly” Action**

- ▶ Kean University's Fire Safety Training Program;
- ▶ US Department of Energy associated SolSmart, which provides webinars and virtual training resources;
- ▶ IREC's Clean Energy Resources and Training, which provides webinars and virtual training resources.

**OBSTACLES AND BARRIERS**

Department heads will need to identify the training program more appropriate to their needs.

**NEXT STEPS**

- ▶ Department heads will require their staff to complete relevant training courses once every one to three years.
- ▶ The Green Team or Borough Administrator will work with those department heads to identify the most appropriate training program for their needs and capabilities.

2.7 BUY RENEWABLE ENERGY FOR MUNICIPAL FACILITIES

*“Municipalities are able to buy electricity on the open market that is then delivered through their usual utility supply channel. Municipal officials can specify the amount of green content in their electricity mix, either by buying directly from a green energy supplier, or (more commonly) participating in a buying pool that includes renewable power. By purchasing renewable electricity (RE electricity) in this way, the municipality can often reduce its energy costs while also reducing its greenhouse gas emissions, become less vulnerable to fossil fuel costs, and help create demand for more sustainable sources of energy.” (Sustainable Jersey Action Guide for “Buy Electricity from a Renewable Source”)*

Buy renewable electricity for municipal facilities directly from a green energy supplier or participate in a buying pool that supplies electricity with high renewable content. The accompanying renewable energy certificates (RECs) should be certified as PJM Class I.



**“Buy Electricity from a Renewable Source” Action**

Buying renewable energy is an option for municipalities that face obstacles to installing on-site electric generation, or that want to fill gaps that are unmet by the generation systems they do install on their properties. Municipalities, like property owners, can purchase energy from third-party suppliers in lieu of their utility provider in order to enjoy some of the benefits of renewable energy without the costs and effort associated with developing the generation infrastructure.

The Borough can also join “aggregate buying pools” with other municipalities subscribing to renewable

energy services. Examples of such a pool includes the Passaic County Energy Regional Cooperative Pricing System (PCERCPS), and New Jersey Sustainable Energy Joint Meeting (NJSEM).

## OBSTACLES AND BARRIERS

- ▶ The Borough must evaluate how purchasing renewable energy fits into the Borough's other energy goals and initiatives, such as installing on-site renewable energy or subscribing to a community solar project. For example, would purchasing renewable energy fill gaps unmet by on-site or community solar projects, or would it be a long term practice for reducing energy costs and emissions;
- ▶ Purchasing energy from a third party provider may disqualify the Borough from some of the incentive programs offered by PSE&G.

## NEXT STEPS

- ▶ If the Borough determines that purchasing renewable energy fits its objectives, the Borough Administrator and elected officials will identify third-party renewable energy suppliers or aggregate energy buying pools that provide the best and most secure deal for the Borough.
- ▶ The energy portfolio of the supplier or pool should exceed New Jersey's current Renewable Portfolio Standard (it was 22.5% in 2021), and the renewable share of the portfolio should be mostly, if not all, PJM Class 1 Renewable Energy Certificates. The Borough can enter into bi-lateral contracts with the supplier in order to specify the portion of energy to come from renewable sources.
- ▶ The Borough will enter into a contract within three years of the adoption of this Plan. The timeframe for this initiative will depend upon the timing of its on-site renewable energy installation initiatives.

## 2.8 OFFER A SOLAR EMPLOYEE BENEFIT PROGRAM / 2.9 INSTITUTE A COMMUNITY-WIDE SOLAR PURCHASING PROGRAM

Collective purchasing programs can result in discounts on solar installations to municipal employees or to Borough residents and businesses by substantially reducing the customer acquisition cost for solar installers.

To conduct such a program the Borough can invite solar installers to offer special pricing to municipal employees and to Borough residents and businesses through request for proposal (RFP) processes.

The costs to the Borough to implement this program are minimal to none. The Borough's responsibilities beyond issuing the RFP and selecting one or more vendors, are to promote the solar purchasing campaign to the potential end users (employees, residents, businesses, organizations).

There are a variety of models for community wide solar purchasing programs. One provider, Posigen, primarily leases solar to residents and will make charitable financial or solar equipment contributions to a cause or organization of the partner-municipality's choice for each successful solar installation made through the partnership.

The Borough can promote the program through regular communications to residents (newsletters), bill mailings, the Borough website, public meetings, and notices or signs on municipal properties. The selected vendor(s) may provide the Borough with promotional materials, as the costs of printing and other advertising

*Offer a collective solar purchasing program for municipal employees, promoted via existing employee communication network. This type of program utilizes scale and low customer acquisition costs to make installing solar more affordable for participating employees. Schools and municipalities can collaborate to form a larger pool of potential customers, even including student families in the offer.*

*Partner with solar installers or a solar marketplace to offer special pricing on solar installations to residents and/or businesses for a limited time. Establish the partner solar installer(s) and special pricing via RFP process, then advertise the offering to the community. Alternatively, partner with a competitive online solar marketplace to offer residents a custom online webpage to receive quotes.*



### "Solar Outreach" Action

costs will still be minimal compared to typical customer acquisition costs.

**OBSTACLES AND BARRIERS**

- ▶ Success will depend on the quality of RFP responses and buy-in from municipal employees and residents to take advantage of the program.
- ▶ As an overburdened community with a significant LMI population and a predominantly rental housing stock, the Borough may have difficulty obtaining high-quality RFP responses or buy-in from property owners.

**NEXT STEP**

The Borough will RFP for solar installation vendors to offer discounted services to municipal employees and Borough property owners at a discount, with an even greater discount for LMI households. The candidate with the best offering for discounts and most promising portfolio will be selected. The Borough will then promote its solar purchasing program to employees and residents through regular communications and meetings.

**2.6 INSTALL ON-SITE MUNICIPAL RENEWABLE GENERATION / 2.13 HOST A COMMUNITY SOLAR PROJECT ON MUNICIPAL PROPERTY**

**MUNICIPAL PROPERTIES**

The Borough and the Prospect Park Board of Education own a number of properties that may be suitable to generate solar energy, including:

- ▶ Municipal Building Rooftop – approximately 5,825 square feet of roof surface;
- ▶ Municipal Building Surface Parking Lot – approximately 7,715 square feet
- ▶ Prospect Park Public School Roof – approximately 39,960 square feet of roof surface
- ▶ Public Works Roof – approximately 3,100 square feet per roof pitch
- ▶ Potential Parking Lot Acquisition at 333 North 8th Street – approximately 10,000 square foot lot.
- ▶ Hofstra Park – Potential areas which do not require clearing of trees include the 23,300 square foot parking areas, open areas around the northernmost playground area, the approximately 1,000 square foot per pitch roof face of the picnic pavilion.

The cost of erecting ground mounted solar panels is typically greater than roof-mounting, especially if there is not already existing electrical infrastructure at the intended location. Roof mounting, however,

*Host a solar, wind, or geothermal project on municipal property to generate renewable energy for municipal facilities. Such projects can be leased from a developer or purchased and owned outright.*

*Host a community solar project on municipal property, such as a DPW garage, parking lot/garage, or landfill. Most municipalities lease the site to the developer or enter a power purchase agreement (PPA) with the developer to buy the electricity at a reduced rate.*



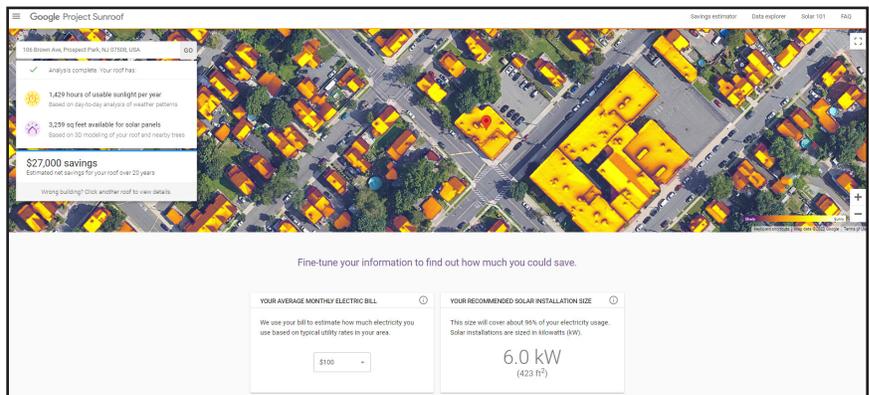
**“Municipal On-Site Solar System” Action**



**“Municipal Wind Energy System” Action**



**“Municipally Supported Community Solar” Action**



**Figure 9. Screenshot of Google Project Sunroof data for Borough Hall**

only requires roofs to be in good condition.

Google's Project Sunroof, a mapping service that calculates potential solar electricity generation and savings, estimates potential average electric generation from rooftops on the above listed sites at 0.01419 kW per available square foot of roof area:

- ▶ Borough Hall (106 Brown Avenue) – 0.01419 kW per square foot x 3,259 square feet available per Google modeling = 46.25 kW potential
  - ▶ Average monthly electric use on the site is approximately 30 kW.
- ▶ Prospect Park Public School (94 Brown Avenue): 0.01419 kW per square foot x 26,886 square feet available per Google modeling = 381.51 kW potential
- ▶ Public Works Roof (162 North 13th Street): 0.01419 kW per square foot x 4,651 square feet available per Google modeling = 66 kW potential
  - ▶ Average monthly electric use on the site is approximately 3.5 kW.
- ▶ Picnic Pavilion (180 Prescott Avenue): 27.8 kw for the whole roof (1,956 s.f. per Google modeling)
  - ▶ Average monthly electric use on the site is approximately 4.6 kW.

Project sunroof does not estimate available area or solar access at ground level; therefore, parking areas previously identified are not listed above. Notwithstanding, DMR expects that those properties could generate electricity at a slightly lower rate than rooftops, to account for shade from trees and topography.

## COSTS

Project costs in the first two stages of the process depend on the time spent by consultants and contractors, the printing and purchase of materials, and other expenses that the Borough chooses to use to engage the community and raise awareness about the program.

According to energysage.com, the average solar panel installation cost in December 2022 in New Jersey was \$2.92 per watt, or \$2,920/kW. That means that for the projects above, the cost of solar installation would be:

- ▶ **Borough Hall (106 Brown Avenue)** - Up to 46.25 kW = \$135,050
- ▶ **Prospect Park Public School (94 Brown Avenue)** - Up to 381.51 kW = \$1,114,009
- ▶ **Public Works Roof (162 North 13th Street)** - Up to 66 kW = \$192,720
- ▶ **Picnic Pavilion (180 Prescott Avenue)** - Up to 27.8 kw = \$81,176

In considering these costs, the Borough should also acknowledge that the potential generation from these projects would cover the energy typically used by these properties and others, eliminating or reducing the Borough's monthly energy expenses.

Costs are greater for ground-mounted arrays than rooftop installations, as more infrastructure is involved.

Sustainable Jersey's "Municipal On Site Solar System" action guide estimates an average maintenance cost for solar infrastructure at "\$10-20 per kW per year".

## MODES OF OWNERSHIP

The following is taken from Sustainable Jersey's "Municipal On Site Solar System" action guide:

- ▶ *Municipally Owned Solar PV Systems: When a municipality purchases solar photovoltaic equipment outright, the project is no different than any other larger capital improvement project. This approach usually offers a better return on investment than financing the project with a lease or other arrangement. However, outright solar PV purchases present multiple challenges: acquiring immediate capital to cover upfront costs; managing procurement, permitting, and installation; and maintaining the system over time. The municipality is also tasked with capturing all available revenue from the project, which*

includes displaced utility purchase value and revenue from the sale of the Renewable Energy Certificates (RECs). See "Note 3. Renewable Energy Credits (RECs)" on page 36.

- ▶ *Financed Solar PV Systems: Commercial financing products are a popular approach to implementing municipal on-site solar projects.*
- ▶ *Leased Systems: Under a leasing arrangement, the municipality pays a monthly leasing fee over a specific term to use the electricity generated by the panels, which are owned by a third party. With a PPA, the municipality contracts to purchase all the electricity that the (third party-owned) system produces at a known price for a fixed term. In both arrangements, there is typically an end-of-term buyout option and a robust maintenance agreement over the term.*

### Note 3. Renewable Energy Credits (RECs)

Vouchers of monetary value representing a megawatt-hour (MWh) of renewable electricity generation. In New Jersey, RECs acquired from solar installations are known as Solar Renewable Energy Certificates or "SRECs." As directed by the Clean Energy Act of 2018, New Jersey's original SREC Program was closed in 2020 and replaced with the Successor Solar Incentive (SuSI) Program that launched in mid-2021, which awards "SREC-Is" for solar energy generation. Projects under 5 MW receive SREC-Is via the Administratively Determined Incentive (ADI) Program. More information on SRECs, including the latest details on the SuSI Program, can be found at [NJCleanEnergy.com/RE](https://NJCleanEnergy.com/RE).

*Energy consultants can help scope out the financing opportunities for a project. Some energy consultants structure their fees to be included in the project financing, allowing the municipality to avoid the fees as upfront cost."*

It should be noted that the language above was written prior to the passing of the Inflation Reduction Act by the federal government in 2022, which allowed municipalities to directly receive the same benefits as the federal tax credit to private citizens and businesses through the "direct pay" model. This model makes ownership of a municipal renewable energy project a competitive alternative to leasing or PPAs.

## COMMUNITY SOLAR VERSUS ON-SITE GENERATION

With on-site generation of energy from a solar project on a Borough property, the Borough can directly utilize the energy generated from the installation, allowing it municipal operations to continue during power outages, while also generating revenues from the sale of RECs.

With a community solar installation on municipal property, however, the community solar provider owns and maintains the solar equipment, and electricity is sold directly to the grid. The benefits to the Borough through this model include lease payments from the community solar provider to the Borough, discounts to the Borough if it signs up as the anchor subscriber, and the lack of any up-front costs to the Borough to install the panels.

Based on discussions with a community solar provider, the minimum size for a successful community solar project is 30,000 to 50,000 square feet. The public school property and Hofstra Park may be the only municipal properties that can meet that threshold.

Sustainable Jersey provides guidelines for the process of launching a Community Solar program and the time frame thereof:

1. **Planning:** The process of forming a committee, hosting public meetings and stakeholder meetings, and determining the priorities and goals of the project – whether that may be generating revenue from municipal properties, providing low cost energy to LMI households, or something else – may take several weeks.
2. **Public Education and User Interface:** Educating the public about the program and creating the means for residents and businesses to sign up to participate could take 4 to 6 months.
3. **Selecting a Vendor/Partner:** The bidding, selection, and/or on-boarding process could take 2 to 3 months or longer.

## LOW- AND MODERATE-INCOME INCLUSION

As an overburdened community with a high percentage of LMI households, Prospect Park's municipally hosted community solar program must be designed to prioritize benefits for the Borough's most economically challenged residents. Recommended strategies from Sustainable Jersey to achieve this include:

- ▶ Reserve a percentage of the total site generation for LMI subscribers: Reserving a percentage of the subscriptions for LMI residents helps to ensure that subscriptions are available for LMI residents as the LMI targeted outreach takes effect.
- ▶ Offer enhanced subscription pricing for LMI residents: The project can offer LMI subscriptions at a discounted price; this discount can be negotiated as part of the contract with the developer or underwritten by the municipality or another sponsor.
- ▶ Provide supportive LMI contract terms. LMI subscribers may feel more comfortable subscribing if contract lengths are shorter. Inclusion of a penalty-free contract release for unplanned events, such as an unexpected relocation, will also make LMI residents feel more at ease subscribing. LMI subscriptions should have the payments set at the same price throughout the contract, with no payment escalator.

## NEXT STEPS

1. Municipal On-Site Project
  - a. The Borough's Administration and heads of its Public Works and emergency services departments will assess the benefits of installing solar panels on municipal buildings to reduce utility costs and provide continuity of service during a power outage. The focus of this assessment will be Borough Hall and the Public Works properties;
  - b. The Borough's Public Works Superintendent will provide a preliminary assessment of the condition of municipal building roofs and parking lots to support solar equipment;
  - c. The Borough will issue requests for proposals from private solar installers, which will require responders to estimate the direct payment the Borough may receive as a result of the Inflation Reduction Act and potential revenues from REC sales over the life of the solar array equipment;
  - d. This process will take place within two years.
2. Municipally-Hosted Community Solar Project
  - a. The Borough will coordinate with the Borough's Board of Education and the Parks and Recreation Department to assess the feasibility of hosting community solar projects on one or both properties;
  - b. During the next available Community Solar program application cycle the Borough will issue an RFP for community solar providers based on the BPU's application scoring criteria;
  - c. The RFP will require at least 51% of the solar project capacity to be reserved for LMI residents and require the project to offer a discount of at least 25% to LMI subscribers.

## OTHER FACTORS

If the Borough is able to acquire property within the Quarry Redevelopment Area, it may be able to consider that property for community solar.

## STRATEGY 3: MAXIMIZE ENERGY EFFICIENCY AND CONSERVATION AND REDUCE PEAK DEMAND

The goal of Strategy 3 is to take actions within the Borough's power to reduce energy usage by the municipality, residents and businesses. As technology advances, appliances, equipment, and construction materials become more energy efficient. The Borough can take direct action to upgrade its own facilities, and can launch public outreach initiatives to make the public aware of services and resources available from the state and from PSE&G to offset the costs of improving building energy efficiency.

- ▶ **3.1 Upgrade Energy Efficiency for Municipal Facilities** - Upgrade municipal facilities to be more energy efficient. New Jersey's Clean Energy Program and electric and natural gas utilities offers incentive programs that guide municipalities through the upgrade process, starting with free audits to establish the most effective measures to reduce energy use. Following implementation, showcase upgrades in energy efficiency outreach to local commercial entities.
- ▶ **3.2 Residential Energy Efficiency Outreach Campaign** - Implement an outreach effort to help residents take advantage of energy efficiency incentive programs offered by New Jersey's electric and natural gas utilities, including Home Performance with ENERGY STAR and Comfort Partners.
- ▶ **3.3 Commercial Energy Efficiency Outreach Campaign** - Implement an outreach effort to help local businesses take advantage of energy efficiency incentive programs offered by New Jersey's electric and natural gas utilities, including the Direct Install (DI) program.

### 3.1 UPGRADE ENERGY EFFICIENCY FOR MUNICIPAL FACILITIES

An important piece of the Borough's energy strategy is reducing the its energy consumption by replacing inefficient equipment, fixtures, and appliances and identify areas where energy is being wasted due to outdated building design or improper building maintenance. The Borough desires to achieve a 20% reduction in energy consumption from its most energy-demanding facility or 20% across all of its facilities.

The Borough does not qualify for State programs like the Local Government Energy Audit (LGEA) and Energy Savings Improvement Program (ESIP) due to the size and energy usage of the Borough's facilities. However, the Borough may be eligible for incentives for audits and energy improvement savings through PSE&G. . The Business Energy Saver Program guide identifies rebates available for equipment, appliances, and fixtures. The Borough should also qualify for PSE&G's Direct Install program, described in "Note 4. Energy Upgrade Types" on page 38.

#### NEXT STEPS

1. The Borough's Administrator or their designee will contact PSE&G to select a qualified energy auditing professional to identify opportunities and to improve the efficiency of its buildings.
2. Following the completion of an audit, the

Upgrade municipal facilities to be more energy efficient. New Jersey's Clean Energy Program and electric and natural gas utilities offers incentive programs that guide municipalities through the upgrade process, starting with free audits to establish the most effective measures to reduce energy use. Following implementation, showcase upgrades in energy efficiency outreach to local commercial entities.

#### Note 4. Energy Upgrade Types

- Direct Install - Provides turnkey energy efficiency solutions for small commercial customers, including local government facilities for municipalities and schools. Includes a free on-site energy assessment (similar to an ASHRAE Level I audit), energy efficiency upgrade recommendations, and an incentive of up to 80% of installed cost for completing those recommendations.
- Prescriptive Equipment - Offers simple rebates on a wide range of pre-qualified "standard" energy efficiency measures.
- Custom Equipment - Offers incentives for energy efficiency measures that do not fall under the Prescriptive Program.
- Engineered Solutions - Provides tailored energy efficiency assistance to larger public entities. Includes

Borough will pursue the efficiency improvement strategy that best meets its needs and goals. It will strive to achieve 20% annual energy savings for one building or across all buildings;

- The Borough will utilize PSE&G's Direct Install program, available rebates, and/or other suitable program to offset the up-front costs of implementing the energy efficiency upgrade strategy.

an investment grade (ASHRAE Level 3) energy audit, engineering design, bid-ready document development, installation vendor selection assistance, construction administration, commissioning, and maintenance and verification services to support the implementation of cost-effective and comprehensive efficiency projects.

- Energy Management - Helps identify and implement no and low-cost energy efficiency measures via equipment tune-ups and commissioning.

### 3.2 RESIDENTIAL ENERGY EFFICIENCY OUTREACH CAMPAIGN / COMMERCIAL ENERGY EFFICIENCY OUTREACH CAMPAIGN



#### “Energy Efficiency for Municipal Facilities” Action

Ninety-eight percent of the Borough's electricity usage in 2021 was attributed to residential uses (74%) and commercial uses (24%). Similarly, 89% of natural gas to the Borough was purchased by residential uses and 10% by commercial uses. See “Figure 10. Percentage of Electricity and Natural Gas Purchased by Sector in 2021” on page 40. Encouraging residents and businesses to make improvements that reduce their energy usage is, therefore, one of the most effective actions the Borough can take to reduce local energy consumption. The Borough will take the following actions with a goal of encouraging 5% of households and 5% of commercial property owners to make energy efficient upgrades to their properties:

*Implement an outreach effort to help residents take advantage of energy efficiency incentive programs offered by New Jersey's electric and natural gas utilities, including Home Performance with ENERGY STAR and Comfort Partners.*

*Implement an outreach effort to help local businesses take advantage of energy efficiency incentive programs offered by New Jersey's electric and natural gas utilities, including the Direct Install (DI) program.*



#### “Residential Energy Efficiency Outreach” Action



#### “Commercial Energy Efficiency Outreach” Action

#### RESIDENTIAL OUTREACH

The Borough will partner with a municipally approved contractor, selected through a competitive RFP/RFQ process to balance low cost and high performance, to provide “Home Performance with ENERGY STAR” assessments for homeowners in the Borough at a reduced cost. The contractor would be paid by energy audit/assessment fees paid by property owners and residents, rather than by the Borough. The selected contractor would be required to participate in PSE&G's “Home Performance with Energy Star” program.

The Home Performance program provides participating residents with opportunities to benefit from up to \$5,000 in rebates and up to \$15,000 in interest-free loans for qualifying upgrades, paid over 8 to 10 years.

As most of the housing units in the Borough are rental units, the Borough will also conduct outreach to multi-unit property owners regarding PSE&G's Energy

#### Note 5. Residential Energy Use Facts (Sustainable Jersey)

- Owners of older homes are particularly vulnerable to rising energy costs. Homes built prior to the 1970's oil embargo are often much less energy-efficient than newer units.
- More than half of the 80 million single-family homes in the United States were constructed before modern energy codes existed.
- Many homes are poorly insulated, have high levels of air infiltration, inefficient heating and air conditioning systems, and inefficient water heaters and appliances.
- About 40% of households report at least some winter drafts, and 60% complain of a room that is too warm in the summer.
- Energy efficiency assessments can identify sources of poor air quality and other safety and comfort issues in the home that can be addressed in recommended energy efficiency upgrades.

Check for Multi-Family Homes program, through which multi-unit property owners can schedule an appointment for PSE&G specialists to assess energy saving opportunities in on the property and in willing residents' apartments. The Borough should emphasize in its outreach the reduced maintenance costs of more modern equipment

### COMMERCIAL OUTREACH

The Borough will use available outreach tools to encourage its businesses to participate in PSE&G's Direct Install program. Similar to the residential program described above, the Direct Install program assists businesses to assess opportunities to reduce energy use by as much as 30%, reduce the businesses share of the costs of such energy improvements, and provide the businesses with interest-free, 5-year loans. The Direct Install program also advertises that it can reduce the costs to the purchaser by up to 80%.

Similar to the residential outreach process, the Borough may be able to select a designated contractor to provide services to the Borough's businesses at a reduced rate.

### NEXT STEPS

The Borough will take the following steps as part of this initiative:

1. RFP/RFQ for contractors that are approved by PSE&G for the Home Performance program in order to obtain preferred rates for Borough residents;
2. Coordinate with PSE&G to maximize benefit from Direct Install program for local businesses;
3. Include information about the programs in tax and utility bill mailings to increase awareness;
4. Work with prominent community groups such as religious institutions and parent-teacher organizations to include information about the programs in their own outreach mailings and meetings;
5. Provide information about the programs on the municipal website;
6. Remind the public about the programs during Borough Council meetings;

The Borough will request that the selected contractor, upon intake of residential or commercial clients in the Borough, inquire as to how the client learned of the program, in order for the Borough to assess which of its outreach programs were most successful.

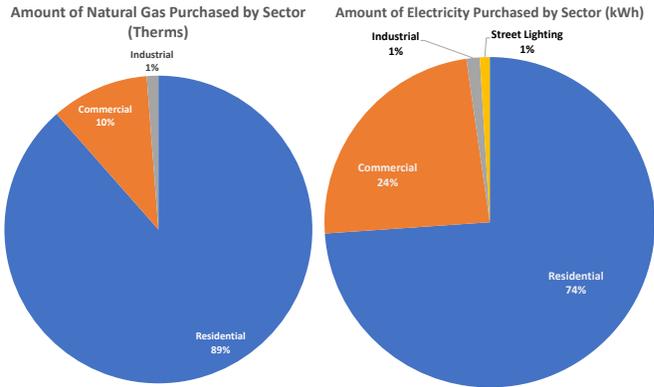
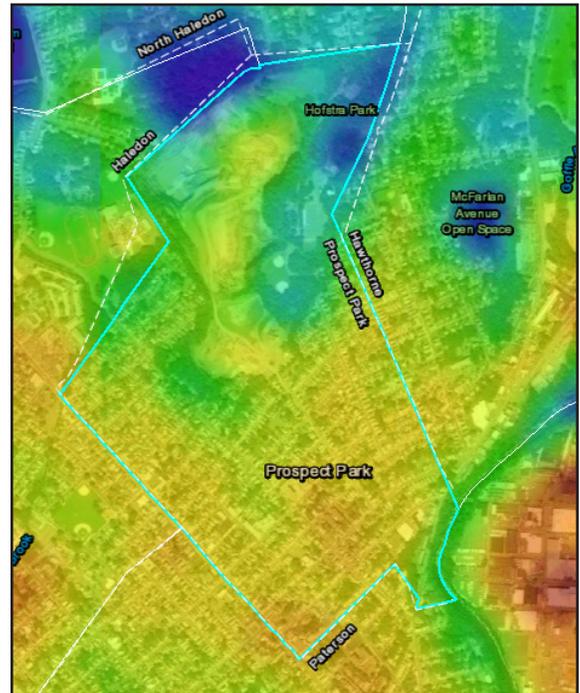


Figure 10. Percentage of Electricity and Natural Gas Purchased by Sector in 2021



Map 5. Urban heat map, published by Sustainable Jersey. Blue represents cool areas and red represents hot areas. Heat is lower in areas with greater tree coverage.

### OTHER OPPORTUNITIES: PLANT STREET TREES

Planting street trees is an excellent and relatively inexpensive way to reduce building energy consumption induced by the urban heat island effect, while also promoting attractive streetscapes and improving property values. Curb strips in prospect park are generally narrow and limit the size of the trees



### "Tree Planting Programs" Action

that can be planted without undermining sidewalks and curbs. Small trees can fit in most of the curb strips that are at least two feet wide, and root barriers can be installed to prevent damage to hardscape. Where curb strips do not exist, such as along Planten Avenue, where sidewalks are 7.5 to 8 feet wide, the Borough could plant trees in tree wells or tree beds; however, in no instance should the tree plantings reduce the walkable sidewalk width to less than four feet.

In lieu of the Borough planting trees in curb strips, the Borough can establish a fund to reimburse property owners for planting trees within their front yards at appropriate distances from the sidewalk to simultaneously provide shade for the sidewalk and protect sidewalks from root damage.

*OTHER OPPORTUNITIES: NEIGHBORHOOD PRESERVATION PROGRAM AND NEIGHBORHOOD REVITALIZATION PROGRAM*

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The Borough is eligible to participate in the Neighborhood Preservation Program (NPP) or Neighborhood Revitalization Tax Credit (NRTC) program, which provides funding mechanisms to promote economic stability and revitalization in neighborhoods through a non-profit entity dedicated to neighborhood improvement, such as a Special Improvement District (SID). The neighborhood improvement entity established through these programs may be able to use a portion of its funds to provide existing businesses and property owners in the designated neighborhood with energy saving building upgrades.

*OTHER OPPORTUNITIES: NEIGHBORHOOD HOMES INVESTMENT ACT*

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The Borough and its professionals should monitor the status of the Neighborhood Homes Investment Act, being considered by Congress at the time of this writing. The program, if passed, would create a tax credit for substantial rehabilitation/renovation of existing one- to four-unit homes in overburdened communities such as Prospect Park. The program may make energy-saving improvements more affordable and accessible to owner-occupants in the Borough. If the program is enacted, the Borough should use property tax communications and other regular communications to property owners to promote the program and encourage property owners to take full advantage of the tax credits.

## STRATEGY 4: REDUCE ENERGY CONSUMPTION AND EMISSIONS FROM THE BUILDING SECTOR

New construction projects are opportunities for municipalities to set a trend moving forward for environmentally responsible, high-quality buildings that meet green building standards. Green buildings provide a number of benefits to the community, to the developer, to the operator, and to the occupants of the buildings. They demand less of the community's resources, place lesser burdens on community infrastructure, have lower long term operating and maintenance costs, and provide healthier living and working spaces than buildings that do not meet green building standards.

Prospect Park will take the following actions to encouraging green building practices in the Borough:

- ▶ **4.3 Require Developers to Complete Green Development Checklist** - Pass a Green Building Policy or Resolution that requires developers to submit a completed Green Development Checklist with Site Plan Applications. Checklist should refer developers to NJCEP's Commercial and Residential New Construction Energy Efficiency programs.
- ▶ **4.4 Conduct Outreach Targeting New Construction in the Community** - Reach out to developers to encourage participation in NJCEP's Commercial and Residential New Construction Energy Efficiency programs.

### 4.3 REQUIRE DEVELOPERS TO COMPLETE GREEN DEVELOPMENT CHECKLIST

A development checklist does not have the same regulatory impact as an ordinance or formal policy document; however, by requiring a developer to disclose the environmental impact of a development, the Borough can motivate the developer to take steps to improve the project's green profile.

Sustainable Jersey publishes a sample green building checklist which the Borough will use as the basis for drafting its own checklist. Some of the items in the checklist include, but are not limited to:

- ▶ Whether the project is on a brownfield;
- ▶ Whether the project constitutes infill or greenfield development;
- ▶ The proximity of the project to public transit and/or complete streets;
- ▶ Whether the project preserves or adaptively reuses existing or historical buildings;
- ▶ Impact of the project on stormwater;
- ▶ Provision of amenities like open space, conservation or restoration of environmental features, inclusionary set-asides, facilitating local agriculture (farmers market space), compact and efficient vehicle parking spaces, commuter shuttles, bike parking facilities, and the like.
- ▶ Use of low-impact design features like bio-swales, green walls, pervious pavement, and

Pass a Green Building Policy or Resolution that requires developers to submit a completed Green Development Checklist with Site Plan Applications. Checklist should refer developers to NJCEP's Commercial and Residential New Construction Energy Efficiency programs.



**"Create a Green Development Checklist" Action**



**"Green Building Policy/Resolution" Action**

#### Note 6. Benefits of a Green Building Policy (Sustainable Jersey)

- Owners of older homes are particularly vulnerable to rising energy costs. Homes built prior to the 1970's oil embargo are often much less energy-efficient than newer units.
- More than half of the 80 million single-family homes in the United States were constructed before modern energy codes existed.
- Many homes are poorly insulated, have high levels of air infiltration, inefficient heating and air conditioning systems, and inefficient water heaters and appliances.
- About 40% of households report at least some winter drafts, and 60% complain of a room that is too warm in the summer.
- Energy efficiency assessments can identify sources of poor air quality and other safety and comfort issues in the home that can be addressed in recommended energy efficiency upgrades.

the like;

- ▶ Use of recycled building materials; and
- ▶ Use of energy efficient equipment/appliances, on-site generation, water efficiency or reuse, use of natural air and light.

The sample checklist, along with a sample green building resolution, are contained within the appendices to this Plan.

**NEXT STEPS**

1. The Borough will authorize its Planner to review with the Borough's Construction Department and engineering consultant the sample checklist and sample resolution contained within this plan as well as other example checklists and resolutions and draft checklists and resolutions that meet the Borough's needs;
2. The Borough will adopt an ordinance requiring completion of the checklist with any development application for major new development.
  - a. The Borough will make reasonable exceptions with respect to the size and type of development to ensure it does not impact homeowners repairing, renovating, or making modest expansions to their homes.
  - b. The Borough will explore enhancing the checklist to incorporate initiatives required for certification under LEED or other green building rating systems, in order to encourage developers to pursue LEED level improvements.

**4.4 CONDUCT OUTREACH TARGETING NEW CONSTRUCTION IN THE COMMUNITY**

The NJ Clean Energy Program offers incentives for new construction of energy efficient residential and commercial buildings.

For residential buildings, the incentives are listed in the chart to the right based on the efficiency grade, and are further detailed in "Note 7. Residential Energy Efficiency Standards, per NJ CEP RNC Program" on page 43 and in "Figure 11. NJ CEP Residential New Construction Incentives".

NJ CEP's new construction program for commercial and industrial projects provides incentives for both new construction projects and gut rehabilitation or substantial renovation projects. The new construction program includes three incentive categories: Whole Building/Comprehensive, Multi-Measure, and Single-Measure, which provide incentives for varying levels of energy saving construction practices. See "Figure 12. NJ CEP Commercial New Construction Incentives" on page 44.

**NEXT STEPS**

The Borough will promote these programs through media and in locations where developers are most likely to see them, including:

- ▶ As an attachment to the Green Building

Reach out to developers to encourage participation in NJCEP's Commercial and Residential New Construction Energy Efficiency programs.

	Single Home (1 & 2 Family Home)	Townhouse (3+ Connected Units)	Multifamily (low rise: 3 stories or less; 3+ units)	MFHR - Multifamily High Rise (5+ units; 4+ stories) <small>Only applicable to building permits pulled prior to July 1, 2021</small>	MFNC - Multifamily New Construction (3+ units; any stories)
<b>Energy Star</b>	\$1,000 per home + \$30 for each MMBtu (determined by the Rater after construction)	\$500 per home + \$30 for each MMBtu (determined by the Rater after construction)	\$500 per home + \$30 for each MMBtu (determined by the Rater after construction)	\$500 per home + \$30 for each MMBtu (determined by the Rater after construction)	\$500 per home + \$30 for each MMBtu (determined by the Rater after construction)
<b>ZERH (Zero Energy Ready Home)</b>	\$4,000 per home + \$30 for each MMBtu (determined by the Rater after construction) Rater Incentive: \$1,200 per home	\$2,500 per home + \$30 for each MMBtu (determined by the Rater after construction) Rater Incentive: \$1,200 per home	\$1,500 per home + \$30 for each MMBtu (determined by the Rater after construction)	N/A	N/A
<b>ZERH + RE (Zero Energy Ready Home +Renewable Ready Home)</b>	\$4,000 per home + \$30 for each MMBtu (determined by the Rater after construction) \$2,000 bonus Rater Incentive: \$1,200 per home	\$2,500 per home + \$30 for each MMBtu (determined by the Rater after construction) \$1,500 bonus Rater Incentive: \$1,200 per home	\$1,500 per home + \$30 for each MMBtu (determined by the Rater after construction) \$750 bonus	N/A	N/A
<b>UEZ/Affordable House Bonus</b>	+\$500 per home (added to any level above)	+\$500 per home (added to any level above)	N/A	N/A	N/A

Figure 11. NJ CEP Residential New Construction Incentives

**Note 7. Residential Energy Efficiency Standards, per NJ CEP RNC Program**

- New Jersey ENERGY STAR Homes are designed to achieve 15% more energy efficiency than the building code. These homes meet ENERGY STAR version 3.0 or 3.1 standards, which means they are ENERGY STAR certified.
- New Jersey Zero Energy Ready Home requires a

Checklist, development application forms, and other mandatory forms or documents to be completed by developers;

- ▶ On the Land Use Board and/or Building Department's websites;
- ▶ Encouraged in new or amended Redevelopment Plans.

The Borough will request marketing materials from the NJ CEP to assist in this initiative.

NJCEP is considering updates for both the commercial and residential programs at the time of this writing, which may not match the contents on this page. The distributed information will be updated at such time that the NJ CEP publishes its changes.

**OTHER OPPORTUNITIES: CAPITALIZE ON ECONOMIC INCENTIVE PROGRAMS**

The Borough can take advantage of a number of different economic incentive programs and use them as leverage to require redevelopment or rehabilitation to incorporate green building practices or obtain LEED certification:

- ▶ The Borough is a Qualified opportunity zone, established as part of the 2017 Tax Cuts and Jobs Act, which provides tax incentives for investment in new development in the Zone.
- ▶ Development in the Borough may be eligible for New Market Tax Credits; however, the program expires at the end of 2025.

**OTHER OPPORTUNITIES: REQUIRE GREEN BUILDING IN REDEVELOPMENT OR REHABILITATION PLANS**

The Borough has areas that are likely to qualify for designation as areas in need of redevelopment and rehabilitation. Plans adopted for designated areas can require buildings to meet certain energy efficiency thresholds identified through the incentive programs run by NJ CEP or other entities.

high energy efficiency achievement in new home construction. The program requirements include meeting or exceeding all DOE Zero Energy Ready Homes technical standards, building in compliance with the ENERGY STAR Homes Program checklists, meeting 2015 IECC insulation levels, and certifying under EPA's Indoor airPLUS Program.

- **Zero Energy Home +RE (ZERH+Renewables)** This pathway has the same requirements as the ZERH pathway with the additional requirement that 100% the building's modeled energy usage is met by renewable energy systems installed prior to completion of the home.
- **Multi-Family High Rise (MFHR) Program** requires 15% increased energy savings above code. This pathway will satisfy the requirements for ENERGY STAR Multifamily New Construction (MFNC) Version 1.1 certification.

Savings Potential	Program	Description
●●●	<b>Whole Building/ Comprehensive: Pay for Performance Program</b>  Apply Now	This program is designed for commercial, industrial, and multifamily buildings with 50,000 square feet or more of planned conditioned space. Construct your building to perform better than code compliant buildings with the help of our approved partners and receive incentives.
●●	<b>Multi-Measure: Customer Tailored Energy Efficiency Program</b>  Apply Now	This program allows customers to bundle multiple prescriptive and custom measures into a single application without enrolling in a whole-building program. In addition to measure incentives, customers are eligible for technical assistance incentives to help offset soft costs associated with custom measure development.
●	<b>Single Measure: SmartStart Buildings Program</b>  Apply Now	SmartStart offers prescriptive and custom incentives for projects addressing individual building systems. Includes fixed dollar amounts for installations of popular technologies with well-established savings, such as gas heating and HVAC, and Custom incentives based on energy savings for non-standard equipment that performs beyond code requirements.

Figure 12. NJ CEP Commercial New Construction Incentives

## **STRATEGY 6: SUPPORT COMMUNITY ENERGY PLANNING AND ACTION WITH AN EMPHASIS ON ENCOURAGING AND SUPPORTING PARTICIPATION BY LOW- AND MODERATE-INCOME AND ENVIRONMENTAL JUSTICE COMMUNITIES**

The objective of Strategy 6 is to ensure that the Borough's most vulnerable cohorts, including LMI households, households with language barriers, and others, are engaged and included in the Borough's energy initiatives. Many of the actions that individuals can take to reduce energy costs or adopt clean energy require significant up front costs. As an overburdened community, it is essential that Prospect Park ensure that LMI households can benefit from and be involved in initiatives such as any community solar projects, and that LMI households and non-English proficient persons or other communication barriers are engaged and made aware of opportunities for them to reduce their energy costs and energy impact.

The initiatives to be pursued by the Borough include:

- ▶ **6.1 Make Community Energy Planning Inclusive** - *Ensure low- and moderate-income residents are represented in energy planning processes, both on the core planning team and among those contributing via public comment. Methods include scheduling meetings at convenient times (varying meeting time if needed), engaging with community organizations that can elevate underrepresented voices, and advertising planning meetings in appropriate media.*
- ▶ **6.2 Conduct Energy Efficiency Outreach to Low- and Moderate-Income Residents** - *Promote state and utility energy efficiency programs for low- and moderate-income (LMI) residents using community-serving institutions as messengers, using non-English promotional materials where appropriate, and emphasizing co-benefits of energy efficiency upgrades (health, safety, and comfort).*
- ▶ **6.4 Support Low- and Moderate-Income Community Solar Subscriptions** - *As a partner in a community solar project, ensure that some project capacity is reserved for low- and moderate-income (LMI) residents and/or a discount is offered for LMI subscribers.*
- ▶ **6.5 Conduct Energy Efficiency Outreach to Community-Serving Institutions** - *Reach out to limited-capacity entities that serve low- and moderate income communities to encourage participation in state and utility energy efficiency programs. Outreach strategies include messaging benefits of reduced capital, maintenance, and energy costs and segmenting outreach to different types of organization with different needs.*

### 6.1 MAKE COMMUNITY ENERGY PLANNING INCLUSIVE

The desired outcome of this initiative is to ensure that all residents can be involved in the planning process, and particularly planning processes that pertain to sustainability.

The Borough will take a number of actions to ensure that the planning process is open and accessible to as many members of the public as possible, which may include:

- ▶ Publishing meeting agendas and documents relating to the Community Energy Plan or energy projects on the Borough website at least one week before the Application is scheduled to be heard;
- ▶ Publishing meeting minutes on the Borough website within two weeks of approval of said minutes;
- ▶ Hosting digital surveys and in person workshops on significant planning projects or policy considerations;

These initiatives to increase public participation will be lead by the Board Chairpersons and Secretaries, and

*Ensure low- and moderate-income residents are represented in energy planning processes, both on the core planning team and among those contributing via public comment. Methods include scheduling meetings at convenient times (varying meeting time if needed), engaging with community organizations that can elevate underrepresented voices, and advertising planning meetings in appropriate media.*



**"Improve Public Engagement in Planning and Zoning" Action**

the Borough Administrator or their designee.

## 6.2 CONDUCT ENERGY EFFICIENCY OUTREACH TO LOW- AND MODERATE-INCOME RESIDENTS

This Community Energy Plan has identified several programs designed to make energy efficiency and clean energy affordable to homeowners and owners of multi-unit dwellings. Cohorts that are more difficult to engage include renter households, homeowners with language barriers, and homeowners who are elderly, and homeowners for whom the most impactful projects are out of reach even with incentives and rebates to offset project costs.

Promote state and utility energy efficiency programs for low- and moderate-income (LMI) residents using community-serving institutions as messengers, using non-English promotional materials where appropriate, and emphasizing co-benefits of energy efficiency upgrades (health, safety, and comfort).



### “Energy Assistance Outreach” Action

### INCENTIVE AND COST-ASSISTANCE PROGRAMS

- ▶ PSE&G’s “Marketplace” website offers substantial discounts on energy and water-saving items that renters and homeowners with limited budgets can purchase and install in their homes, including low-flow shower heads, energy saving power-strips, thermostats, and LED light bulbs. In some cases, the purchaser can receive these items for free. Helping renters access the Marketplace is an effective way help them save energy and money; and Marketplace shoppers are also likely to follow the redirect links for PSE&G’s energy efficiency incentive programs for larger purchases like HVAC, boilers, and furnaces. PSE&G will occasionally send sample packages to address where new accounts are established to make customers aware of cost saving opportunities.
- ▶ PSE&G offers a Home Weatherization Program for Income-Qualified Customers, which provides free energy efficiency assessments to income qualified customers and covers the installation cost of up to \$6,000 in energy efficiency upgrades and \$1,500 in health and safety improvements. The qualifying income range for the program is between 250% and 400% of the federal poverty level.
- ▶ Comfort Partners is a joint program between PSE&G and NJCEP that provides energy efficiency and weatherization assistance to households at or below 250% of the federal poverty level.

### Note 8. Income Based Energy Assistance Programs

- **Lifeline Program** - Operated by the NJ Department of Human Services to assist income eligible disabled adults or seniors to afford utility costs;
- **LIHEAP (Low Income Home Energy Assistance Program) / Universal Service Fund** - Helps to offset home energy and heating costs for low-income households.
- **PAGE (Payment Assistance for Gas and Electric)** - Helps to offset energy and gas costs for income eligible households.

PSE&G and other State and utility entities also offer a number of programs to assist income-eligible persons as well as elderly or disabled persons to afford their home energy and heating costs. See “Note 8. Income Based Energy Assistance Programs” on page 46.

Elderly and non-English speaking residents may be more difficult to engage as they may not be comfortable with online marketplaces or may not receive welcome materials in the language they are most comfortable with. According to the 2021 American Community Survey, 1,171 out of 5,740 Borough residents over the age of five years old speak English at a level “less than very well”, equaling over 20% of the population. Just over 9% of households (171 of 1,858) in the Borough were classified as limited English speaking households in the 2021 ACS. The Borough could work with PSE&G and local non-profits servicing seniors and non-English speaking populations to distribute energy efficiency and water efficiency kits directly to their constituents.

### NEXT STEPS

- ▶ The Borough will host a “Green Fair”, either as a one time event or as an annual or semi-annual event, to educate the public about available programs, opportunities, or energy saving practices.

The Borough will seek sponsorship from PSE&G, NJ BPU, Sustainable Jersey, home and small-business energy efficiency contractors, hybrid and EV car dealerships, solar installers, and home electronics vendors others who can use the Fair to reach-out to potential customers in the Borough. The Borough can also post exhibits at the Fair about its own energy accomplishments, goals, and objectives, and to seek public input about potential initiatives.

- ▶ The Borough will work with PSE&G to include information about the PSE&G Marketplace and PSE&G's rebate and incentive programs in regular Borough mailers and electronic communications.

#### 6.4 SUPPORT LOW- AND MODERATE-INCOME COMMUNITY SOLAR SUBSCRIPTIONS

As part of the Borough's efforts to establish a Community Solar project, it will work any vendor operating the program to ensure that the project prioritizes low- and moderate-income households. The Borough will prefer firms that can reserve at least 51% of the project's capacity for LMI households, and to provide those households with a discount of 15% or more.

*As a partner in a community solar project, ensure that some project capacity is reserved for low- and moderate-income (LMI) residents and/or a discount is offered for LMI subscribers.*



**"Energy Assistance Outreach" Action**



**"Municipally Supported Community Solar" Action**

#### IMPLEMENTATION STRATEGY

The steps for selecting a Community Solar provider are addressed in Chapter 2 of this Plan. When selecting a vendor for a community solar project on municipal property or in which the Borough is a partner, the Borough will give preference to or require providers that can reserve capacity and offer discounts for LMI households and offer. The agreement will include reasonable conditions in which the reserved capacity is relinquished to the general public to ensure that the project is economically viable.

#### 6.5 CONDUCT ENERGY EFFICIENCY OUTREACH TO COMMUNITY-SERVING INSTITUTIONS

There are instances where improving the energy efficiency of community-serving organizations lead to improved services to their constituents. The Borough can assist local non-profits and commercial services, including houses of worship, health clinics, and other entities providing services to LMI households and other vulnerable populations, to access grants, loans, and other energy efficiency incentives, or educate them on the ways in which they can adopt solar energy at little to no cost.

*Reach out to limited-capacity entities that serve low- and moderate income communities to encourage participation in state and utility energy efficiency programs. Outreach strategies include messaging benefits of reduced capital, maintenance, and energy costs and segmenting outreach to different types of organization with different needs.*

In addition to assisting these organizations in reducing their energy costs, the Borough can work with them to serve as messengers to communicate to their constituents about energy efficiency programs and the benefits of lowering their energy costs.

#### NEXT STEPS

Outreach to these community serving organizations is best carried out by the Green Team to demonstrate to the organization and their constituents that they are valued partners in the Borough's community energy planning process. The selected liaison(s) to these organizations should reach out to their leaders to discuss the most effective way to communicate to their constituents about energy efficiency and to use energy savings to best benefit their constituents.

#### OTHER OPPORTUNITIES: MUNICIPAL REVOLVING LOANS, GRANTS, AND REBATES

The Borough can adopt a resolution committing to set-aside a percentage of future PILOT revenues from redevelopment projects to fund revolving loan, grant, or rebate programs to assist low- and moderate-

income households to cover the balance of renewable energy, energy storage, or energy efficient equipment installations after all rebates, tax credits, and reimbursements. In addition to, or in-lieu of drawing from future PILOT revenues for this program, the Borough could commit to set aside funds for these programs equal to a portion of any rebates or reimbursements the Borough receives for energy improvements to municipal properties.

## STRATEGY 7: EXPAND THE CLEAN ENERGY INNOVATION ECONOMY

As renewable energy generation technology has improved, so has technologies designed to make renewable energy work better for both utility providers and end users. An example of this is energy storage technology - typically a battery that can store energy during off-peak hours and release it during peak hours, or that can provide a stable power source during blackouts and brownouts.

Consider a residential rooftop solar energy system: The system generates the most energy during the daytime, when many end-users (residents) are not home and therefore using little to no energy. Thanks to net metering, a household with rooftop solar can sell energy back to the grid to power uses like offices, schools, and public services for which peak energy demand takes place in the daytime; however, most of the energy required by that household to power their evening activities will be coming from the utility provider (PSE&G, in this case). Energy storage allows that household to make direct use of the energy generated from the rooftop installation by storing solar-generated energy during the day and releasing it in the evenings.

For public services, energy storage systems not only help to offset energy costs, but also to provide for continuity of services during power outages or natural disasters. Consider, for example, a severe snow-storm that results in local power-outages; a solar-powered energy storage system at the DPW site, fire station, or police station, will ensure that roads are kept clear and that emergency services will remain operational, without depending generators that emit fumes from burning of gasoline or natural gas.

Energy storage systems also work for facilities without on-site renewable generation. For customers who elect to be billed based on their energy usage during on- or off-peak hours, energy storage systems can be charged during off-peak hours, when energy costs are lower, using electricity delivered from the grid, so that they can be used to power the customer's activities during peak hours when it would cost more to purchase electricity from the utility. This is a process called "peak shaving".

For both private and public users, regardless of the peak hours of electricity use, battery storage creates opportunities for long term cost savings, as utility providers typically charge their customers different rates according to either on-peak or off-peak hours of usage or the total amount of energy used in the billing period.

Microgrids, which combine energy storage systems with forms of renewable on-site energy generation systems to reduce energy costs and allow neighborhoods, campuses, or whole communities to continue to have electricity when the larger grid fails, may be considered by municipalities that have multi-functional municipal complexes or which are host to major hospitals, universities, or corporate campuses that require operations continuity during blackouts and have the collective resources to support such a system. The cost of such a system far outweighs the benefits in Prospect Park at this time, but may be considered in the future depending upon the outcomes of the Quarry redevelopment project.

- ▶ **7.1 Adopt Energy Storage Policies** - *Adopt standards and establish requirements for permitting battery energy storage systems. Post information about energy storage regulations to the municipal website and ensure appropriate municipal staff are informed.*
- ▶ **7.2 Install an Energy Storage Project** - *Install on-site energy storage, such as batteries, compressed air, or thermal storage, for municipal facilities. Following construction, showcase the project with on-site kiosks and municipal webpages to encourage others to follow suit.*

### 7.1 ADOPT ENERGY STORAGE POLICIES

As the introduction to this chapter explains, energy storage provides benefits to private and public users by maximizing the benefits of their on-site solar installations, offsetting demand-based energy costs from their utility provider, and providing a source

*Adopt standards and establish requirements for permitting battery energy storage systems. Post information about energy storage regulations to the municipal website and ensure appropriate municipal staff are informed.*

of electricity during a power-outage. Ensuring that the Borough's ordinances permit battery energy storage systems (BESS) is key to enabling property owners and businesses to take advantage of the benefits of this technology.

From a zoning perspective, energy storage systems are, generally, accessory uses and accessory structures, except in instances where the sole use of the site is the housing of energy-storage equipment as part of a microgrid or regional grid system, in which case they are principal uses. Section 235-2301.C of the Borough code specifies accessory uses permitted in the R-1 Single- and Two-Family Residential Zone, which does not include language that could be interpreted to permit BESS (or, as it happens, EVSE systems or rooftop solar equipment). The ordinance would need to be amended to permit BESS on one- and two-family properties.

However, energy storage systems are an emerging technology for which regulation must include fire, nuisance, and public safety considerations. A model law published by New York State Energy Research and Development Authority (NYSERDA) is included in the appendices of this Plan, and contains recommended language to regulate the placement, maintenance, and permitting of energy storage systems.

The preface section of the model law recommends that, before adopting a permitting law, municipalities should take a number of actions to prepare its personnel and reviewing bodies for handling the review and permitting of energy storage installation applications, responding to fires and other emergencies relating to storage systems, and handling of decommissioned storage systems.

The Model Law makes a significant distinction between the treatment of "Tier 1" and "Tier 2" BESS. Tier 1 is a system that the Model Law defines as having "an aggregate energy capacity less than or equal to 600kWh" and consisting of only one (1) energy storage system technology if in an enclosed space. Tier 2 systems have "an aggregate energy capacity greater than 600kWh" or consist of more than one energy storage battery in an enclosed space. The Model Law permits Tier 1 BESS "in all zoning districts, subject to the Uniform Code and the 'Battery Energy Storage System Permit,' and [is] exempt from site plan review." The model BESS Permit is also included in the appendices to this plan. The Model Law contains a lengthy regulatory section concerning Tier 2 systems, making clear that Tier 1 systems pose much lower risks to public safety or welfare.

## NEXT STEPS

1. Prior to adopting a model law, the Borough should invite energy storage system developers and installers to meet with Borough officials, including governing body members, Land Use Board members, public safety personnel, and Building Department personnel to provide an information session regarding BESS;
  - a. Any such meeting will be public to ensure that residents, business owners, and property owners are made aware of the benefits of the technology as well as any associated risks. The Borough should ask the speaker to differentiate between the categories of BESS; particularly between those used for on-site storage by residents, businesses, or government, and those used by a utility ("behind the meter" versus "front of the meter", respectively).
2. Following the meeting, the Borough will adopt an ordinance permitting "Tier 1" BESS consistent with the



**Figure 13. Generac Residential BESS system**

Model Law, and adopting the model permit and model checklist to ensure that BESS are installed safely. The Borough may also adopt an ordinance permitting “Tier 2” systems if it believes that it has the public safety capabilities to respond to emergencies relating to larger scale BESS.

## 7.2 INSTALL AN ENERGY STORAGE PROJECT

BESS on Borough properties can not only maximize the benefits to the Borough from installing on-site solar installations, but can also ensure that the Borough and its various services can continue to operate at full or functional capacity during a blackout. Additionally, installing battery storage at emergency shelters, emergency staging areas, or senior centers can ensure that vulnerable populations have a safe place to stay during natural disaster, severe heat events, or other emergencies.

*Install on-site energy storage, such as batteries, compressed air, or thermal storage, for municipal facilities. Following construction, showcase the project with on-site kiosks and municipal webpages to encourage others to follow suit.*

Another significant benefit of BESS, when installed with on-site solar, is that the solar system can charge the battery during the day, when the sun is up, allowing the facility to run at least partially on battery power at night. As with the solar panels, this eventually pays off in the form of lower electric utility bills.

For the above reasons, the Borough should view BESS installation as an essential part of any installation of solar or wind energy systems on public property, rather than as an initiative to be pursued separately. While a Borough-hosted solar energy system would generate revenues through net metering or through community solar subscriptions, BESS installed with solar energy systems gives the Borough the means to maximize its energy savings and meet the needs of its constituents even in an emergency.

The priority municipal properties for BESS include the DPW facility and Borough Hall, as the bulk of the Borough's essential services take place at these sites. The Firehouse at Fairview Avenue should also be considered if the financial capacity is available.

Emergency shelters should be a secondary priority depending on the Borough's financial capacity.

### INCENTIVES

New Jersey does not have a BESS incentive program at this time; however, the solar investment tax credit (ITC) component of the Inflation Reduction Act provides a 22% tax credit for BESS through 2023, which is expected to drop to 0% in 2024. Local governments can receive direct payments from the federal government reflecting the 22% savings, since they do not pay taxes.

### OTHER FINANCIAL CONSIDERATIONS

The Borough can take direct ownership of the system - paying up-front for the system or borrowing for it - or it can pursue one of three other options to enjoy the benefits of BESS:

- ▶ Shared Savings Agreement (SSA): The system is owned by a third party but the Borough still benefits from reduced utility costs and back-up power.
- ▶ Lease: The Borough leases the system from the provider.
- ▶ Power Purchase Agreement (PPA): The system is owned and financed by a third party, and the Borough purchases power directly from that third party at a reduced rate.

### NEXT STEPS

1. When the Borough requests proposals for on-site solar installations for DPW building or Borough Hall, the RFP will include a request for quotes to include BESS as part of the installation;
  - a. If the Borough chooses to acquire BESS through an SSA, PPA, or lease without on-site renewable generation, the RFP process will require or give preference to vendors that will pass the savings gained from the ITC down to the Borough;

2. If the Borough does not install solar systems on both the DPW building and Borough Hall, the Borough will RFP for battery-only installations on the facility without the solar installation, and require installers to estimate the savings to the Borough from peak shaving over the expected life of the system.
3. The Borough will require that any BESS equipment installed by a selected vendor qualifies for the ITC program.

## CONCLUSION

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The Community Energy Plan examines 24 actions that the Borough will take over a three-to-five year period in order to advance the State's Energy Master Plan, reduce energy costs, expand access to clean energy to low-and moderate-income households, and create green jobs locally. It also identifies several opportunities the Borough will explore to further reduce local energy consumption and GHG emissions while improving quality of life and economic vitality.

Some of these actions require little to no cost to the Borough, such as conducting public outreach about incentive programs, engaging clean energy developers to provide discounts to Borough employees and property owners, and adoption of ordinances, checklists, and permitting documents to expand opportunities for clean energy and transit oriented development.

Other actions in this Plan require larger investments by the Borough, such as installing renewable energy generation and storage systems, improving streetscapes, and replacing inefficient fleet vehicles with electric vehicles or hybrid vehicles. The Borough can, however, use a number of strategies to reduce the costs associated with those actions and avoid passing the costs of the actions on to taxpayers. These include leasing clean energy systems when available instead of purchasing and owning them, taking advantage of incentives from PSE&G and the State and Federal governments, entering into purchasing cooperatives with other governments, utilizing other special financing programs, and strategically offsetting borrowing costs with energy savings.

It should be noted that the time of this writing is a particularly advantageous moment for the Borough to make investments in clean energy, energy savings, and environmentally friendly infrastructure, as the political administrations at the State and Federal level have identified these as priorities. Many of the grants, rebates, and supportive programs identified in this Plan may not be available under future administrations, and some are scheduled to expire or shrink, or may not be renewed after 2023. Therefore it is recommended that the Borough take advantage of the financing opportunities in this Plan early.

### NEXT STEPS

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Following the adopting of the Community Energy Plan, the Borough will establish a Green Team comprised of elected officials, Borough staff, and community members, to set the Borough's agenda and priorities for implementing actions listed in this Plan document as well as actions laid out by Sustainable Jersey for certification.

Furthermore, the Borough will begin to take those actions in this Plan which were identified by the BPU and Sustainable Jersey, and investigate the costs and benefits of pursuing the "other opportunities" identified in this Plan by DMR Architects.

# APPENDIX

## 1

# WORKPLAN TEMPLATE

A SUSTAINABLE JERSEY GUIDE

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# Community Energy Plan Workplan Template



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# Community Energy Plan Workplan Template

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## **Sustainable Jersey**

Sustainability Institute at The College of New Jersey

Forcina Hall, 3rd Floor

2000 Pennington Rd.

Ewing, NJ 08628-0718





**This report was made possible through a grant from New Jersey's Clean Energy Program™. New Jersey's Clean Energy Program is brought to you by the New Jersey Board of Public Utilities.**

### **ABOUT THE NEW JERSEY BOARD OF PUBLIC UTILITIES (NJBP)**

The NJBP is a state agency and regulatory authority mandated to ensure safe, adequate and proper utility services at reasonable rates for New Jersey customers. Critical services regulated by the NJBP include natural gas, electricity, water, wastewater, telecommunications and cable television. The Board has general oversight and responsibility for monitoring utility service, responding to consumer complaints, and investigating utility accidents.

### **ABOUT THE NEW JERSEY CLEAN ENERGY PROGRAM (NJCEP)**

NJCEP, established on January 22, 2003, in accordance with the Electric Discount and Energy Competition Act (EDECA), provides financial and other incentives to the State's residential customers, businesses and schools that install high-efficiency or renewable energy technologies, thereby reducing energy usage, lowering customers' energy bills and reducing environmental impacts. The program is authorized and overseen by the New Jersey Board of Public Utilities (NJBP).

### **ABOUT SUSTAINABLE JERSEY**

Sustainable Jersey is a certification program for municipalities in New Jersey. Launched in 2009, Sustainable Jersey is a nonprofit, nonpartisan organization that supports community efforts to reduce waste, cut greenhouse gas emissions, and improve environmental equity. It provides tools, training and financial incentives to support and reward communities as they pursue sustainability programs. Sustainable Jersey is one hundred percent voluntary and each town can choose whether it wants to get certified and the actions it wants to do in order to achieve enough points to get certified.

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# Introduction

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**This document is a tool for municipalities to use in creating a Community Energy Plan as part of the NJBPU Community Energy Plan Grant (“CEPG”) program.** Municipalities participating in the CEPG program must utilize this document to triage known practical and impactful strategies to reduce greenhouse gases and achieve a sustainable energy future. The Workplan Template and accompanying [Sustainable Energy Communities Guide](#) offer guidance on the most high-impact initiatives that New Jersey municipalities can implement, enabling grant recipients to focus planning efforts on the specific who, what, where, when, and why of implementing the initiatives in the community.

**Part I** provides descriptions of high-impact initiatives to consider as part of the municipality’s Community Energy Plan. Municipalities may include initiatives not listed in Part I, but Community Energy Plan Grant recipients must seriously consider each initiative in the list.

For each initiative, Part I offers a brief description, potential measures of success, relevant resources for completing the initiative, and potential community stakeholders. Most (but not all) of the initiatives are linked to Sustainable Jersey energy actions; all of the actions required for Sustainable Jersey’s Gold Star in Energy are included.

The initiatives are organized to correspond with the seven strategies of the [New Jersey Energy Master Plan \(EMP\)](#). Within each EMP Strategy, initiatives appear roughly in order of municipal roles, starting with regulation and policy, followed by public services, then municipal operations strategies, then community-facing initiatives.

**NOTE: EMP Strategy 5 is not included as municipalities do not have jurisdiction over grid regulatory issues.**

Initiatives are also rated by general impact and difficulty, though these factors vary by municipality depending on municipal staff capacity, types of businesses in the community, existing infrastructure, and so on. Municipalities should consider these local factors when selecting which initiatives to implement.

**Part II** is a workspace for the municipality to fill in with implementation details for each of the initiatives selected for the Community Energy Plan. These details include the lead person and entity, general start date, immediate next steps, and other elements relevant to how the initiative will be implemented after the Community Energy Plan is adopted.

# Directions for Completing this Document

**To complete the Workplan Template, the municipality should:**

1

Consider each initiative listed in Part I, conducting research to determine if the initiative is feasible and desirable for the community. Research may include engaging the public and working with the municipal staff responsible for implementation. Sustainable Jersey is available to provide technical assistance and/or referrals to relevant experts.

2

Decide which initiatives will be included in the Community Energy Plan and indicate chosen initiatives using the provided check boxes.

3

For each initiative that is NOT selected for inclusion in the Community Energy Plan, describe the reasoning for not including it (e.g., cost, lack of resources, other significant barriers to implementation) in the Comments/Rationale section of the corresponding box in Part I.

4

For each initiative to be included in the Plan, complete a fill-in-the-blank page from Part II including key implementation details such as the lead person/department, start date, and immediate next steps. Use the “Measures of Success” and “Potential Stakeholders” in Part I to inform the “Community notes” section of Part II.

# PART I: Checklist *Example*

0.0 Name of Initiative

IMPACT: ● ● ●

DIFFICULTY: ■ ■ ■

CHECK IF DOING:

Introduction and information on the initiative

## Measures of Success

- Measure 1
- Measure 2
- Measure 3

## Resources

- Resource 1
- Resource 2
- Resource 3

## Potential Stakeholders

- Stakeholder 1
- Stakeholder 2

✗ Comments/Rationale for NOT including this Initiative:

0.0 Name of Initiative

IMPACT: ● ● ●

DIFFICULTY: ■ ■ ■

CHECK IF DOING:

Introduction and information on the initiative

## Measures of Success

- Measure 1
- Measure 2
- Measure 3

## Resources

- Resource 1
- Resource 2
- Resource 3

## Potential Stakeholders

- Stakeholder 1
- Stakeholder 2

✗ Comments/Rationale for NOT including this Initiative:

## 1.1 Adopt Supportive Zoning and Regulations for EV Infrastructure

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Pass [NJDCA's Model Statewide Municipal EV Ordinance](#) specifying electric vehicle charging stations (EVSE) as a permitted accessory use, establishing the permitting process for charging stations, and requiring Make-Ready and EVSE parking in new multifamily developments and parking lots. Modify the model ordinance standards for safety, signage, etc. as needed.

### Measures of Success

- “Reasonable Standards” language modified and finalized
- Ordinance passed
- Make-Ready and EV charging parking minimums posted to municipal website

### Resources

- NJDCA's [Model Statewide Ordinance](#)
- Sustainable Jersey's [Make Your Town Electric Vehicle Friendly](#) action
- Great Plains Institute's [Summary of Best Practices in EV Ordinances](#)

### Potential Stakeholders

- Downtown businesses/business association
- Real estate developers

✗ *Comments/Rationale for NOT including this Initiative:*

## 1.2 Train First Responders on EVs and EVSE

IMPACT: N/A

DIFFICULTY: 

CHECK IF DOING:

To further public confidence and maintain emergency preparedness, require training on electric vehicles and associated infrastructure for local first responders.

### Measures of Success

- Training held for each relevant department
- Policy established for ongoing training

### Resources

- Sustainable Jersey's [Make Your Town Electric Vehicle Friendly](#) action
- NFPA's [Alternative Fuel Vehicles Safety Training Program](#)

### Potential Stakeholders

- Local fleet managers that handle EVs
- Neighboring municipalities
- Automobile dealerships

✗ *Comments/Rationale for NOT including this Initiative:*

Not a priority for the Borough at this time

### 1.3 Train Non-Emergency Staff on EVs and EVSE

IMPACT: ● ○ ○

DIFFICULTY: ■ ■ ■

CHECK IF DOING:

Initiate electric vehicle cross-training for non-emergency staff such as code officials, automotive technicians, and electricians.

#### Measures of Success

- Training held for each relevant department
- Policy established for ongoing training

#### Resources

- Sustainable Jersey’s [Make Your Town Electric Vehicle Friendly](#) action
- NAFTC’s [Courses and Workshops](#)

#### Potential Stakeholders

- Neighboring municipalities
- Local unions

#### ✗ Comments/Rationale for NOT including this Initiative:

Not a priority for the Borough at this time

### 1.4 Purchase Alternative Fuel Vehicles

IMPACT: ● ○ ○

DIFFICULTY: ■ ■ ■

CHECK IF DOING:

Replace existing municipal fleet vehicles with plug-in hybrid, battery electric, or other sustainable alternative fuel vehicles, using fleet analysis to inform purchases.

#### Measures of Success

- Strategic plan prioritizing vehicles in fleet to replace with AFVs
- Fleet charging infrastructure installed for municipal vehicles
- First battery electric vehicle added to municipal fleet
- At least 6.5% of municipal vehicles are electric

#### Resources

- Sustainable Jersey’s [Purchase Alternative Fuel Vehicles](#) action
- Sustainable Jersey’s [Alternative Fuel Vehicle Procurement Guide](#)
- Fleets for the Future [Electric Vehicle Procurement Best Practices Guide](#)
- DVRPC’s [Electric Vehicle Resource Kit for Municipalities](#)
- NJBPU’s [Clean Fleet EV Incentive Program](#)

#### Potential Stakeholders

- Fleet management companies (e.g., transportation analytics firms)

#### ✗ Comments/Rationale for NOT including this Initiative:

## 1.5 Improve Municipal Fleet Efficiency

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Coordinate the strategic replacement (or retirement) of vehicles, scheduling of preventative maintenance, and improvement of driver efficiency to reduce the GHG footprint of all municipal fleets – public works, police, fire, etc. Requires tracking of fleet data such as age of vehicles, duty cycle, and use patterns.

### Measures of Success

- Annual fleet inventory process established
- Annual driver training established
- 20% reduction in fleet emissions within 4-year span

### Resources

- Sustainable Jersey’s [Fleet Inventory](#) action
- Sustainable Jersey’s [Meet Target for Green Fleets](#) action
- Atlas Public Policy’s [Fleet Procurement Analysis Tool](#)

### Potential Stakeholders

- Fleet management companies (e.g., transportation analytics firms)
- Municipal services contractors (e.g., waste services companies)

✗ *Comments/Rationale for NOT including this Initiative:*

## 1.6 Install Public EV Charging Infrastructure

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Install electric vehicle charging infrastructure, including chargers, signage, and safety and accessibility features, for public use.

### Measures of Success

- First public EV charging station installed
- 2 public EV charging stations per 10,000 residents

### Resources

- Sustainable Jersey’s [Public Electric Vehicle Charging Infrastructure](#) action
- NJDEP’s [It Pay\\$ to Plug In](#) grant program
- Sustainable Jersey’s [Alternative Fuel Vehicle Procurement Guide](#)
- DVRPC’s [Electric Vehicle Resource Kit for Municipalities](#)

### Potential Stakeholders

- Electric utility
- [Transportation Management Association](#)
- Car dealerships
- Car share providers

✗ *Comments/Rationale for NOT including this Initiative:*



## 2.1 Adopt Supportive Zoning and Permitting for Private Solar

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Provide clear guidance/standards for solar developers and limit barriers to solar adoption such as lengthy permitting and multiple reviews.

### Measures of Success

- Pass solar-friendly ordinance
- Expedite/eliminate zoning permit
- Establish flat fee for permitting

### Resources

- Sustainable Jersey's [Guidance for Creating a Solar Friendly Ordinance](#)
- Sustainable Jersey's [Make Your Town Solar Friendly](#) action
- US DOE's [SolSmart Program Guide](#)

### Potential Stakeholders

- Resident organizations (e.g., homeowners associations)
- Solar developers
- Local businesses/business associations

✗ *Comments/Rationale for NOT including this Initiative:*

## 2.2 Post Solar Permitting Checklist

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Provide clear guidance/standards for solar developers with a permitting checklist that can be easily found on the municipality's website. Solicit feedback from users and revise checklist based on comments.

### Measures of Success

- Permit requirement checklist online
- Permit checklist revised based on user feedback

### Resources

- IREC's [Guide to Preparing Solar Permitting Checklists](#)
- Solar Ready Kansas City's [Streamline Permitting: Best Management Practices for Solar Installation Policy](#)
- Sustainable Jersey's [Make Your Town Solar Friendly](#) action

### Potential Stakeholders

- Resident organizations (e.g., homeowners associations)
- Solar developers

✗ *Comments/Rationale for NOT including this Initiative:*

## 2.3 Adopt Zoning and Permitting for Community Solar

IMPACT:	
DIFFICULTY:	
CHECK IF DOING:	<input checked="" type="checkbox"/>

Update municipal zoning ordinances to specifically allow large-scale solar projects, and designate future community solar sites as redevelopment zones. Consider offering direct assistance with permitting, expediting the permitting process, and/or reducing permitting fees for community solar.

### Measures of Success

- Zoning ordinance adopted enabling large-scale solar projects
- Municipal point of contact established for community solar developers
- Site designated as development zone to host community solar

### Resources

- Sustainable Jersey's [Community Solar Guide](#)
- Sustainable Jersey's [Municipally Supported Community Solar](#) action

### Potential Stakeholders

- Community solar developers
- Community solar site hosts
- Low- and moderate-income housing developers/managers

✗ *Comments/Rationale for NOT including this Initiative:*

## 2.4 Train First Responders on Solar

IMPACT:	N/A
DIFFICULTY:	N/A
CHECK IF DOING:	<input checked="" type="checkbox"/>

To further public confidence and maintain emergency preparedness, require training on solar infrastructure for first responders.

### Measures of Success

- Training held for each relevant department
- Policy for ongoing training established

### Resources

- Kean University's [Fire Safety Training Program](#)
- IREC's [Allied Professional Training](#)
- US DOE's [SolSmart Program Guide](#)
- Sustainable Jersey's [Make Your Town Solar Friendly](#) action

### Potential Stakeholders

- Neighboring municipalities

✗ *Comments/Rationale for NOT including this Initiative:*

## 2.5 Train Non-Emergency Staff on Solar

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

To ensure municipal staff can efficiently and effectively inspect, review, permit, etc. solar installations in the community, require training on solar infrastructure for all relevant staff.

### Measures of Success

- Training for relevant departments
- Cross-train building, zoning, inspection, and permitting staff
- Policy for ongoing training

### Resources

- IREC's [Allied Professional Training](#)
- US DOE's [SolSmart Program Guide](#)
- Sustainable Jersey's [Make Your Town Solar Friendly](#) action

### Potential Stakeholders

- Neighboring municipalities
- Local unions

✗ *Comments/Rationale for NOT including this Initiative:*

## 2.6 Install On-Site Municipal Renewable Generation

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Host a solar, wind, or geothermal project on municipal property to generate renewable energy for municipal facilities. Such projects can be leased from a developer or purchased and owned outright.

### Measures of Success

- Contract with a developer to buy or lease a renewable installation on municipal property
- Implement outreach illustrating the benefits of renewable energy to the community using the municipal project

### Resources

- Sustainable Jersey's [Municipal On-Site Solar System](#); [Municipal Wind Energy System](#); and [Municipal Geothermal Energy System](#) actions
- American Cities Climate Challenge [On-site Solar Procurement Guidance](#)
- NJCEP's [Renewable Energy webpage](#)

### Potential Stakeholders

- Renewable energy developer(s)
- Local media
- Public school district

✗ *Comments/Rationale for NOT including this Initiative:*

## 2.7 Buy Renewable Energy for Municipal Facilities

**IMPACT:** ● ● ●

**DIFFICULTY:** ■ ■ ■

**CHECK IF DOING:**

Buy renewable electricity for municipal facilities directly from a green energy supplier or participate in a buying pool that supplies electricity with high renewable content. The accompanying renewable energy certificates (RECs) should be certified as PJM Class I.

### Measures of Success

- Contract with third-party supplier or buying pool with a greater proportion of renewable content than current Renewable Portfolio Standard (22.5% for 2021)
- Renewable portion is mostly, if not all, PJM Class I RECs

### Resources

- Sustainable Jersey's [Buy Electricity from a Renewable Source](#) action

### Potential Stakeholders

- Energy consultant
- Energy buying pool (e.g., [NJSEM](#))

✗ *Comments/Rationale for NOT including this Initiative:*

## 2.8 Offer a Solar Employee Benefit Program

**IMPACT:** ● ● ●

**DIFFICULTY:** ■ ■ ■

**CHECK IF DOING:**

Offer a collective solar purchasing program for municipal employees, promoted via existing employee communication network. This type of program utilizes scale and low customer acquisition costs to make installing solar more affordable for participating employees. Schools and municipalities can collaborate to form a larger pool of potential customers, even including student families in the offer.

### Measures of Success

- 10% of employees get a quote through purchasing program
- 5% of employees participate in the program

### Resources

- Sustainable Jersey's [Solar Outreach](#) action
- NREL's [Solarize Guidebook](#)

### Potential Stakeholders

- Municipal employee associations
- Local solar developer(s)
- Parent-teacher associations
- Public school district

✗ *Comments/Rationale for NOT including this Initiative:*

## 2.9 Institute a Community-wide Solar Purchasing Program

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Partner with solar installers or a solar marketplace to offer special pricing on solar installations to residents and/or businesses for a limited time. Establish the partner solar installer(s) and special pricing via RFP process, then advertise the offering to the community. Alternatively, partner with a competitive online solar marketplace to offer residents a custom online webpage to receive quotes.

### Measures of Success

- 5% of residents receive quotes for solar installations
- 2% of residents install solar as part of the campaign

### Resources

- Sustainable Jersey's [Solar Outreach](#) action
- NREL's [Solarize Guidebook](#)

### Potential Stakeholders

- Local solar developer(s)
- Local media
- Service organizations
- Homeowners associations

✗ *Comments/Rationale for NOT including this Initiative:*

## 2.10 Implement Renewable Government Energy Aggregation (R-GEA)

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Establish a Renewable Government Energy Aggregation (R-GEA) program. R-GEA is a third-party electric supply contract negotiated by a municipality (or group of municipalities) on behalf of its residents. Utilizing their size, municipalities can negotiate for a supply that is more sustainable, often less expensive, and with better and more secure terms than can typically be achieved by individual residents.

### Measures of Success

- Third-party supplier bids received below utility electricity rate
- R-GEA contract contains high-quality renewable content (e.g., PJM Class-I) at least 20% above the current RPS at the time (RPS is 22.5% for 2021)

### Resources

- Sustainable Jersey's [How-To Guide: Renewable Government Energy Aggregation](#)
- Sustainable Jersey's [Renewable Government Energy Aggregation](#) action

### Potential Stakeholders

- Energy consultant(s)
- Local media
- Neighboring municipalities

✗ *Comments/Rationale for NOT including this Initiative:*

Not consistent with municipal energy objectives

## 2.11 Support Community Solar as Project Ambassador

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Facilitate connections between community solar developers and the local site owner, anchor subscribers, nonprofit sponsors, and/or affordable housing property owners. Municipalities can lend credibility to the multi-benefit opportunity of a potential community solar project.

### Measures of Success

- Anchor subscribers established for community solar project
- Project partner underwrites subscription fees for low- and moderate-income residents

### Resources

- Sustainable Jersey's [Municipally Supported Community Solar](#) action
- Sustainable Jersey's [Community Solar Guide](#)

### Potential Stakeholders

- Community solar developers and project hosts
- Affordable housing organizations
- Faith-based organizations

### Comments/Rationale for NOT including this Initiative:

Other renewable energy initiatives are more effective use of municipal resources

## 2.12 Support Community Solar as Outreach Coordinator

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Use municipal resources and networks (mailing lists, websites, etc.) to educate the community about community solar in general and the details of local projects (e.g., subscription rates and requirements).

### Measures of Success

- Community solar information posted to municipal website
- Community solar promoted by outreach partners via their networks

### Resources

- Sustainable Jersey's [Municipally Supported Community Solar](#) action
- Sustainable Jersey's [Community Solar Guide](#)

### Potential Stakeholders

- Community solar developers
- Local media
- Affordable housing organizations
- Faith-based organizations

### Comments/Rationale for NOT including this Initiative:

Other renewable energy initiatives are more effective use of municipal resources

## 2.13 Host a Community Solar Project on Municipal Property

**IMPACT:** 

**DIFFICULTY:** 

**CHECK IF DOING:**

Host a community solar project on municipal property, such as a DPW garage, parking lot/garage, or landfill. Most municipalities lease the site to the developer or enter a power purchase agreement (PPA) with the developer to buy the electricity at a reduced rate.

### Measures of Success

- Agreement with developer to host a project
- Municipality serves as project anchor subscriber

### Resources

- NJBPU's [Community Solar Brochure](#)
- Sustainable Jersey's [Municipally Supported Community Solar](#) action
- Sustainable Jersey's [Community Solar Guide](#) (pg. 10-14)
- NJDEP's [NJ Community Solar PV Siting Tool](#)

### Potential Stakeholders

- Community solar developers
- Neighborhood associations
- State agencies handling brownfields

✗ *Comments/Rationale for NOT including this Initiative:*

### 3.1 Upgrade Energy Efficiency for Municipal Facilities

IMPACT:

DIFFICULTY:

CHECK IF DOING:

Upgrade municipal facilities to be more energy efficient. New Jersey’s Clean Energy Program and electric and natural gas utilities offers incentive programs that guide municipalities through the upgrade process, starting with free audits to establish the most effective measures to reduce energy use. Following implementation, showcase upgrades in energy efficiency outreach to local commercial entities.

#### Measures of Success

- Apply for [Local Government Energy Audit](#) or Engineered Solutions audit, if eligible
- Achieve 20% annual energy savings for one building
- Achieve 20% annual energy savings across the municipal building portfolio

#### Resources

- [NJ gas and electric utilities’ commercial energy efficiency program websites](#)
- NJCEP’s [Combined Heat and Power](#) program
- Sustainable Jersey’s [Energy Efficiency for Municipal Facilities](#) action

#### Potential Stakeholders

- Public school district
- Neighboring municipalities

✗ *Comments/Rationale for NOT including this Initiative:*

### 3.2 Residential Energy Efficiency Outreach Campaign

IMPACT:

DIFFICULTY:

CHECK IF DOING:

Implement an outreach effort to help residents take advantage of energy efficiency incentive programs offered by New Jersey’s electric and natural gas utilities, including Home Performance with ENERGY STAR and Comfort Partners.

#### Measures of Success

- Outreach team training with Sustainable Jersey
- 5% of residents participate in Home Performance with ENERGY STAR program during the campaign

#### Resources

- [NJ gas and electric utilities’ residential energy efficiency program websites](#)
- Sustainable Jersey’s [Residential Energy Efficiency Outreach](#) action

#### Potential Stakeholders

- Natural gas/electric utility
- HPwES contractor(s)
- Neighborhood and faith-based organizations

✗ *Comments/Rationale for NOT including this Initiative:*

### 3.3 Commercial Energy Efficiency Outreach Campaign

IMPACT:

DIFFICULTY:

CHECK IF DOING:

Implement an outreach effort to help local businesses take advantage of energy efficiency incentive programs offered by New Jersey’s electric and natural gas utilities, including the Direct Install (DI) program.

#### Measures of Success

- Outreach team training with Sustainable Jersey
- 5% of businesses participate in Direct Install program during the campaign

#### Resources

- [NJ gas and electric utilities’ commercial energy efficiency program websites](#)
- Sustainable Jersey’s [Commercial Energy Efficiency Outreach](#) action

#### Potential Stakeholders

- Natural gas/electric utility
- Local DI contractor
- Building Owners and Managers Association
- Local business associations
- Minority business association

✗ *Comments/Rationale for NOT including this Initiative:*

### 3.4 Conduct Energy Efficiency Outreach to Large Energy Users

IMPACT:

DIFFICULTY:

CHECK IF DOING:

Contact large energy users in the community to prompt interest in managing energy use, including participating in utility commercial energy efficiency incentive programs like Engineered Solutions and PJM’s Demand Response program.

#### Measures of Success

- One of the community’s largest energy users enrolls in utility energy efficiency program
- One of the community’s largest energy users enrolls in demand-side management program

#### Resources

- [NJ gas and electric utilities’ commercial energy efficiency program websites](#)
- NJCEP’s [Large Energy Users Program](#)
- Rutgers University’s [Green Building Manual](#)
- Sustainable Jersey’s [Commercial Energy Efficiency Outreach](#) action
- PJM’s [Demand Response](#) program

#### Potential Stakeholders

- Natural gas/electric utility
- Business associations
- Rutgers University Center for Green Building

✗ *Comments/Rationale for NOT including this Initiative:*

Not enough large private energy users in the Borough

## 4.1 Construct New Municipal Buildings as Model Green Buildings

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Implement a policy encouraging or requiring consideration of green building practices for any new municipal construction project. Highlight the incentives from NJCEP's [New Construction Energy Efficiency](#) program. Following construction, showcase green building features with on-site kiosks and digital webpages to encourage others to follow suit.

### Measures of Success

- Pass resolution or ordinance encouraging/requiring that new municipal buildings follow green building practices
- Construct the municipality's first LEED-Platinum building
- Hold a public event touting the "green" features of a new municipal building

### Resources

- Sustainable Jersey's [New Construction](#) action
- Sustainable Jersey's [Green Building Policy/Resolution](#) action
- Rutgers University's [Green Building Manual](#)

### Potential Stakeholders

- Building architects and developers (e.g., member of U.S. Green Building Council)
- Rutgers University Center for Green Building
- Local media

### ✗ Comments/Rationale for NOT including this Initiative:

Not relevant to the Borough at this time

## 4.2 Encourage Benchmarking and Commissioning for Existing Buildings

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Educate local building managers about benchmarking and commissioning. Inform building managers of utility building management programs that include benchmarking and/or commissioning.

### Measures of Success

- Information about benchmarking and commissioning posted to municipal website
- Major building owner agrees to have buildings benchmarked and commissioned

### Resources

- [NJ gas and electric utilities' commercial energy efficiency program websites](#)
- Sustainable Jersey's [Commercial Energy Efficiency Outreach](#) action

### Potential Stakeholders

- Commercial building managers
- Natural gas/electric utility
- Facility maintenance services companies

### ✗ Comments/Rationale for NOT including this Initiative:

Not a priority based on the Borough's existing land use patterns and building inventory

### 4.3 Require Developers to Complete Green Development Checklist

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Pass a Green Building Policy or Resolution that requires developers to submit a completed Green Development Checklist with Site Plan Applications. Checklist should refer developers to NJCEP’s **Commercial** and **Residential** New Construction Energy Efficiency programs.

#### Measures of Success

- **Green Development Checklist** published
- Municipal ordinance requires developers to submit a completed Green Development Checklist
- Major new development utilizes recommendations from Green Development Checklist

#### Resources

- Sustainable Jersey’s **Create a Green Development Checklist** action
- Sustainable Jersey’s **Green Building Policy/Resolution** action

#### Potential Stakeholders

- Builders trade associations (e.g., U.S. Green Building Council)
- Building architects and developers
- Financial institutions

✗ *Comments/Rationale for NOT including this Initiative:*

### 4.4 Conduct Outreach Targeting New Construction in the Community

IMPACT: 

DIFFICULTY: 

CHECK IF DOING:

Reach out to developers to encourage participation in NJCEP’s **Commercial** and **Residential** New Construction Energy Efficiency programs.

#### Measures of Success

- Information on NJCEP’s New Construction Energy Efficiency incentive programs distributed via multiple mediums
- Major new development utilizes NJCEP program(s)

#### Resources

- NJCEP’s **Commercial** and **Residential** New Construction Energy Efficiency webpages.

#### Potential Stakeholders

- Builders trade associations (e.g., U.S. Green Building Council)
- Building architects and developers
- Financial institutions

✗ *Comments/Rationale for NOT including this Initiative:*



### 6.3 Support Shared Mobility Programs

**IMPACT:** 

**DIFFICULTY:** 

**CHECK IF DOING:**

Promote and develop shared transportation networks of buses, cars, bikes, etc. with design features that particularly assist low- and moderate-income residents. Encourage shared transportation services to expand access in low-income neighborhoods and provide low-income membership options.

#### Measures of Success

- Launch new shared transportation option in the municipality
- Create low-income membership option for residents using a shared transportation network

#### Resources

- The Greenlining Institute’s [Electric Carsharing in Underserved Communities](#)
- Federal Highway Administration’s [Travel Behavior: Shared Mobility and Transportation Equity](#)

#### Potential Stakeholders

- Shared electric bike/scooter companies
- Shared automobile companies
- Neighboring municipalities
- [Transportation Management Association](#)

#### Comments/Rationale for NOT including this Initiative:

Limited impact based on resident commuting patterns

### 6.4 Support Low- and Moderate-Income Community Solar Subscriptions

**IMPACT:** 

**DIFFICULTY:** 

**CHECK IF DOING:**

As a partner in a community solar project, ensure that some project capacity is reserved for low- and moderate-income (LMI) residents and/or a discount is offered for LMI subscribers.

#### Measures of Success

- Over 51% of community solar project capacity reserved for LMI residents
- Discount of 15% or more to LMI subscribers of community solar project

#### Resources

- Sustainable Jersey’s [Municipally Supported Community Solar](#) action
- Sustainable Jersey [Community Solar Guide](#)

#### Potential Stakeholders

- Community solar developers
- Affordable housing owners/managers (public & private)
- Community nonprofits
- Tenant’s organizations

#### Comments/Rationale for NOT including this Initiative:

## 6.5 Conduct Energy Efficiency Outreach to Community-Serving Institutions

**IMPACT:** 

**DIFFICULTY:** 

**CHECK IF DOING:**

Reach out to limited-capacity entities that serve low- and moderate-income communities to encourage participation in state and utility energy efficiency programs. Outreach strategies include messaging benefits of reduced capital, maintenance, and energy costs and segmenting outreach to different types of organization with different needs.

### Measures of Success

- Hold an event specifically targeting community-serving institutions for energy efficiency programs
  - In UEZ or Opportunity Zone, if any exist in municipality
- 5% of eligible entities participate in a state/utility energy efficiency program

### Resources

- [NJ gas and electric utilities' commercial energy efficiency program websites](#)
- Sustainable Jersey's [Energy Assistance Outreach](#) action
- ACEEE's [Extending the Benefits of Nonresidential Energy Efficiency to Low-Income Communities](#)

### Potential Stakeholders

- |   |                                    |
|---|------------------------------------|
| • Affordable housing owners/managers (public & private) | • Community foundations            |
| • Health clinics  | • Local business associations      |
| • Faith-based organizations                             | • Food banks and homeless shelters |

**✗ Comments/Rationale for NOT including this Initiative:**

## 7.1 Adopt Energy Storage Policies

IMPACT:

DIFFICULTY: 

CHECK IF DOING:

Adopt standards and establish requirements for permitting battery energy storage systems. Post information about energy storage regulations to the municipal website and ensure appropriate municipal staff are informed.

### Measures of Success

- Regulations adopted addressing battery energy storage
- Permitting system for energy storage established

### Resources

- NYSERDA's [Battery Energy Storage System Guidebook](#)

### Potential Stakeholders

- Electric utility
- Energy storage companies

✗ *Comments/Rationale for NOT including this Initiative:*

## 7.2 Install an Energy Storage System

IMPACT:

DIFFICULTY: 

CHECK IF DOING:

Install on-site energy storage, such as batteries, compressed air, or thermal storage, for municipal facilities. Following construction, showcase the project with on-site kiosks and municipal webpages to encourage others to follow suit.

### Measures of Success

- RFP for municipal energy storage system posted
- Energy storage project installed and operational

### Resources

- SolSmart's [Solar + Storage, A Guide for Local Governments](#)
- Carbon Trust's [Energy Storage Guide](#)

### Potential Stakeholders

- Electric utility
- Energy storage companies

✗ *Comments/Rationale for NOT including this Initiative:*

### 7.3 Develop Local Microgrid

IMPACT:

DIFFICULTY: 

CHECK IF DOING:

Participate in development of a microgrid. Microgrid development generally starts with a feasibility study, followed by project design, then project implementation. Following construction, showcase the project with on-site kiosks, a municipal webpage, and/or ribbon-cutting event.

#### Measures of Success

- Microgrid feasibility study completed
- Microgrid completed

#### Resources

- NJBPU's [Town Center Distributed Energy Resource Microgrid program](#)
- US DOE's [Microgrid Guide for Publicly Owned Critical Infrastructure](#)

#### Potential Stakeholders

- Electric utility
- School/school districts
- Business centers
- Colleges and universities
- Downtown business associations

#### ✗ Comments/Rationale for NOT including this Initiative:

Not relevant to Borough

### 7.4 Develop/Participate in a District Energy System

IMPACT:

DIFFICULTY: 

CHECK IF DOING:

Partner on developing an energy-efficient district energy system. Development generally starts with surveying interest in the community and completing a feasibility study and financial analysis. If district energy makes sense, hire contractor(s) to design and construct the project. Once complete, showcase the project with on-site kiosks, a municipal webpage, and/or ribbon-cutting event.

#### Measures of Success

- Feasibility study for district energy completed
- District energy system installed and operational

#### Resources

- International District Energy Association's [Community Energy: Planning Development and Delivery Guide](#)
- Preservation Green Lab's [The Role of District Energy in Greening Existing Neighborhoods](#)

#### Potential Stakeholders

- Natural gas/electric utility
- Downtown business associations
- Construction companies

#### ✗ Comments/Rationale for NOT including this Initiative:

Not relevant to Borough

# PART II: Template *Example*

<b>EMP Strategy:</b> 1: Transportation	<b>Initiative:</b> 1.2 Train First Responders on EV and EVSE	
<b>Initiative lead:</b> Joe Smith, President of EMS	<b>Initiative start date:</b> 3/2022	<b>Priority for muni:</b> Medium
<b>Anticipated initiative length:</b> Ongoing (annual)	<b>Anticipated funding sources:</b> N/A (no cost)	
<b>Departments involved:</b> <ul style="list-style-type: none"><li>Emergency Medical Services</li><li>Police</li><li>Fire Department</li></ul>	<b>Obstacles/Barriers:</b> <ul style="list-style-type: none"><li>First responder departments are often very busy, training should be scheduled around immediate priorities</li></ul>	
<b>Community notes (include current status, selected measure of success):</b> <ul style="list-style-type: none"><li>No current training is offered, planning to use free offering from National Fire Protection Association</li><li>Will train new first responders annually</li></ul>	<b>Next steps: (specific and tangible):</b> <ol style="list-style-type: none"><li>Joe Smith will register for access to NFPA training.</li><li>Joe Smith will send email to all first responder departments with link to NFPA training and request that all current members complete it by a specified date.</li><li>Joe Smith will schedule next training for same month next year.</li></ol>	

<b>EMP Strategy:</b> 1: Transportation	<b>Initiative:</b> 1: Adopts Supportive Zoning/Regulations for EV Charging Inf
<b>Initiative lead:</b> Mayor and Council	<b>Initiative start date:</b> Completed <b>Priority for muni:</b> N/A
<b>Anticipated initiative length:</b> N/A	<b>Anticipated funding sources:</b> N/A
<b>Departments involved:</b> Mayor and Council Borough Administrator	<b>Obstacles/Barriers:</b>
<b>Community notes (include current status, selected measure of success):</b> Status: Adopted DCA Model Ordinance	<b>Next steps: (specific and tangible):</b> -Governing Body to authorize ordinance to be drafted. -Governing Body to introduce and adopt ordinance.

<b>EMP Strategy:</b> 1: Transportation	<b>Initiative:</b> 4: Purchasing Alternative Fuel Vehicles
<b>Initiative lead:</b> Borough Administrator / Green Team	<b>Initiative start date:</b> 1-3 years <b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> 1-2 years	<b>Anticipated funding sources:</b> NJ BPU/CEP, Charge Up NJ, Tax credits
<b>Departments involved:</b>  Borough Administration Mayor and Council Fleet Directors (Police Chief, Fire Chief, EMT Chief) DPW Superintendent	<b>Obstacles/Barriers:</b>  -Difficulty in acquiring leases for , directly purchasing Fleet EVs -Availability/cost of specialized vehicles (fire, garbage trucks) -Legal obstacles to financing -Inability to secure Service Contracts/Shared Services -Finding NJ Purchasing Cooperatives that are consistent with municipalities objectives -No EVSE at municipal facilities at this time
<b>Community notes (include current status, selected measure of success):</b>  Status: No electric vehicles at this time. MoS: Replacement of least fuel efficient vehicles where electrification would have greatest impact.	<b>Next steps: (specific and tangible):</b>  -Mayor and Council, City Administration and Fleet Chiefs should convene to determine the best course of action for purchasing electric vehicles (purchasing programs, vehicle trade in, securing an EV vendor, installing charging spaces at fleet HQs) -Chiefs of municipal fleets will most likely have the best understanding of their respective fleets and will offer valuable inside information as to what the best fit could be for their departments

<b>EMP Strategy:</b> 1: Transportation	<b>Initiative:</b> 5: Improve Municipal Fleet Efficiency	
<b>Initiative lead:</b> Borough Administrator / Green Team	<b>Initiative start date:</b> < 18 mo	<b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> Ongoing	<b>Anticipated funding sources:</b> N/A	
<b>Departments involved:</b> Department of Public Works Chief Finance Officer Police Department Fire Department Mayor and Council	<b>Obstacles/Barriers:</b>  -Costs to upgrade all existing fleet vehicles -Buy-in from staff (willingness to prioritize energy savings)	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Replace oldest vehicles where substantially more efficient options are available; MoS: Educate staff on fuel saving techniques; MoS: Install idling-emission reducing technology into newer gasoline vehicles; MoS: Explore alternatives to fuel-sharing program that requires less driving (closer than Wayne). MoS: Install low-resistance tires on heavier vehicle	<b>Next steps: (specific and tangible):</b>  - Schedule a training session - Post fuel efficiency guidance literature in common areas - Explore technology to improve gas vehicle efficiency	

<b>EMP Strategy:</b> 1: Transportation	<b>Initiative:</b> 6: Install Public EV Charging Infrastructure	
<b>Initiative lead:</b> Borough Administrator / Green Team	<b>Initiative start date:</b> < 2 years	<b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> Ongoing	<b>Anticipated funding sources:</b> NJDEP, NJ CEP, PSE&G	
<b>Departments involved:</b>  Mayor and Council Administrator DPW Superintendent Finance	<b>Obstacles/Barriers:</b>  - Existing electric infrastructure at selected locations - Risk of vandalism - Networked or non-networked EVSE -Level 2 versus DCFC	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Install EVSE at Borough Hall MoS: Install EVSE at future Borough Parking Lot or centrally located street parking space MoS: Install EVSE at Hofstra Park	<b>Next steps: (specific and tangible):</b>  -Evaluate existing electrical systems at candidate locations -Evaluate long term (30 minutes or more) parking trends at candidate locations -Upgrade systems to support EVSE level selectewhere EV charging equipment is proposed for installation -Evaluate vendor and device options; -Authorize and install first charger	

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 1: Adopt supportive zoning and permitting for private solar
<b>Initiative lead:</b> Governing Body/Green Team	<b>Initiative start date:</b> < 2 years <b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> 2 to 6 months	<b>Anticipated funding sources:</b> N/A
<b>Departments involved:</b>  Mayor and Council Land Use Board Administration Construction Department Planning and Engineering Consultants	<b>Obstacles/Barriers:</b>  -Addressing resident concerns about visual or other impacts without compromising effectiveness of solar installations; -Training construction department in new permitting and inspection processes
<b>Community notes (include current status, selected measure of success):</b>  Status: No ordinances in place MoS: Adopting Solar-friendly ordinance; MoS: Creating an efficient streamlined solar permitting process; MoS: Establishing flat fee for permitting;	<b>Next steps: (specific and tangible):</b>  -Governing Body to request Planning/Engineering/Legal consultants to draft ordinances; -Ordinances to undergo standard review and adoption process

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 2: Post Solar Checklist	
<b>Initiative lead:</b> Governing Body	<b>Initiative start date:</b> < 2 years	<b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> 2 to 6 months	<b>Anticipated funding sources:</b> N/A	
<b>Departments involved:</b> Mayor and Council Land Use Board Administration Construction Department Planning and Engineering Consultants	<b>Obstacles/Barriers:</b>  -Adapting model checklist to municipal needs and capacities will require coordination and occasional amendments	
<b>Community notes (include current status, selected measure of success):</b> Status: No existing checklist MoS: Pass solar-friendly ordinance MoS: Expedite/eliminate zoning permit MoS: Establish flat fee for permitting	<b>Next steps: (specific and tangible):</b>  -Governing Body to request Planning/Engineering consultants and Construction Officials to draft Checklist -Checklist to be adopted by Mayor and Council -Checklist to be posted on municipal website with development application and permitting forms	

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 3: Adopt zoning and permitting for Community Solar	
<b>Initiative lead:</b> Governing Body/Green Team	<b>Initiative start date:</b> < 2 years	<b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> 6-12 months	<b>Anticipated funding sources:</b> N/A	
<b>Departments involved:</b>  Mayor & Council Land Use Board Administration	<b>Obstacles/Barriers:</b>  -Public perception of large-scale solar	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Adoption of community solar zoning/permitting ordinance MoS: Development of a private site with community solar project MoS: Community solar as a permitted use in a Redevelopment area	<b>Next steps: (specific and tangible):</b>  -Governing Body to request Planning/Engineering/Legal consultants to draft ordinances; -Amend existing redevelopment plans to permit community solar, or include community solar in a future redevelopment plan	

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 4: Require training on Solar for First Responders	
<b>Initiative lead:</b> Borough Administrator	<b>Initiative start date:</b> <2 years	<b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> Ongoing, periodic	<b>Anticipated funding sources:</b>	
<b>Departments involved:</b> Police Department Fire Department EMTs	<b>Obstacles/Barriers:</b> <ul style="list-style-type: none"><li>-Developing a straight forward standardized training program</li><li>-Administering the training</li><li>-Securing funding for training program</li><li>-Integrating the training program across the various first response departments</li></ul>	
<b>Community notes (include current status, selected measure of success):</b> MoS: First training held Mos: Training schedule established	<b>Next steps: (specific and tangible):</b> <ul style="list-style-type: none"><li>-Administrator and Department Heads should identify applicable training programs to implement for their first responders</li></ul>	

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 5: Train non emergency staff on on Solar Energy	
<b>Initiative lead:</b> Administrator	<b>Initiative start date:</b> < 2 years	<b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> Ongoing, periodic	<b>Anticipated funding sources:</b> N/A	
<b>Departments involved:</b>  Mayor and Council Construction Officials City Administrators	<b>Obstacles/Barriers:</b>  -Developing or selecting a comprehensive standardized training program applicable to non emergency public staff -Integrating said training program across the relevant departments	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Hold first training session MoS: Establish required schedule of ongoing training	<b>Next steps: (specific and tangible):</b>  -Seek out entities that provide training and or certifications for Solar Energy -Find out if someone from the city can become a certified instructor, and offer instruction to adjacent cities and townships (will also streamline the training process by the courses happening internally)	

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 6: Install On-Site Municipal Renewable Generation
<b>Initiative lead:</b> Administrator/Green Team	<b>Initiative start date:</b> <2 years <b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> 2-3 years	<b>Anticipated funding sources:</b> NJCEP, Tax credit pass through
<b>Departments involved:</b>  City Building Department Mayor and Council Municipal Engineer School District DPW Superindendant	<b>Obstacles/Barriers:</b>  -Identifying the best financing option (purchase, loan, or lease) -Identifying best locations (structurally sound roofs, existing or new parking areas, vacant/open land) -Coordination with School District (largest roof area in the Borough) -Reconciling up front cost with long term benefits
<b>Community notes (include current status, selected measure of success):</b>  MoS: Contract to install solar on a Borough property MoS: Contract to install solar on a Board of Education property	<b>Next steps: (specific and tangible):</b>  -Develop relationship with 3rd party energy developers -Implement incentives for developers such as waiving some development costs and other things of that nature. -Identify most appropriate municipal buildings or properties -Coordinate with School District if school buildings are the most optimal sites for solar

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 7: Buy Renewable Electricity for Municipal Facilities	
<b>Initiative lead:</b> Administrator / Green Team	<b>Initiative start date:</b> <3 years	<b>Priority for muni:</b> Low
<b>Anticipated initiative length:</b> 2-3 years	<b>Anticipated funding sources:</b>	
<b>Departments involved:</b>  Finance Mayor & Council	<b>Obstacles/Barriers:</b>  -Finding a 3rd Party supplier -Applying renewable energy sources and facilities to municipal buildings and departments -Weighing pros and cons of this approach compared to constructing new green energy infrastructure	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Contract with third-party supplier or buying pool with a greater proportion of renewable content than current Renewable Portfolio Standard (22.5% for 2021) MoS: Renewable portion is mostly, if not all, PJM Class I RECs	<b>Next steps: (specific and tangible):</b>  -Weigh benefits of purchasing renewable energy compared to on-site installations or anchor subscriber to community solar program	

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 8: Offer Solar Employee Benefit Program	
<b>Initiative lead:</b> Administrator	<b>Initiative start date:</b> <3 years	<b>Priority for muni:</b> Low
<b>Anticipated initiative length:</b> Ongoing	<b>Anticipated funding sources:</b>	
<b>Departments involved:</b>  Administrator School District Finance	<b>Obstacles/Barriers:</b>  -Implementing a discount program to provide incentives on renewable solar energy -Creating a discount program that is profitable and inexpensive to municipal employees simultaneously -Generating buy-in from employees	
<b>Community notes (include current status, selected measure of success):</b>  MoS: 10% of employees get a quote through the program MoS: 5% of employees participate in the program	<b>Next steps: (specific and tangible):</b>  Partner with a renewable energy / solar provider to explore creation of a discount program	

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 9: Institute Community Wide Solar Purchasing Program
<b>Initiative lead:</b> Administrator / Green Team	<b>Initiative start date:</b> < 2 years <b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> 1-2 years	<b>Anticipated funding sources:</b>
<b>Departments involved:</b>  Administrator Mayor and Council Clerk	<b>Obstacles/Barriers:</b>  -Identifying most effective way to educate public about program
<b>Community notes (include current status, selected measure of success):</b>  MoS: 5% of residents receive quotes for solar installations MoS: 2% of residents install solar as part of the campaign	<b>Next steps: (specific and tangible):</b>  RFP for solar providers to provide reduced rate, with further reductions for LMI households

<b>EMP Strategy:</b> 2: Renewable Energy	<b>Initiative:</b> 13: Host community Solar Project on Municipal Property
<b>Initiative lead:</b> Mayor and Council	<b>Initiative start date:</b> <3 years <b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> Ongoing	<b>Anticipated funding sources:</b> NJ CEP
<b>Departments involved:</b>  Borough Engineering Consultant DPW Superintendent Administrator Planning Consultant Construction Department	<b>Obstacles/Barriers:</b>  -Identifying best locations -Reconciling community solar project benefits with benefits of full ownership of solar generated energy for Borough facilities -Reconciling up front cost with long term benefits
<b>Community notes (include current status, selected measure of success):</b>  MoS: Agreement with developer to host a project MoS: Municipality serves as project anchor subscriber	<b>Next steps: (specific and tangible):</b>  -RFPing for a community solar developer -Negotiating acceptable terms, such as LMI household reservation/rates -Hosting the subscription forms or directing the public to a third party subscription page

<b>EMP Strategy:</b> 3: Maximize Energy Efficiency	<b>Initiative:</b> 1. Upgrade Energy Efficiency for Municipal Buildings
<b>Initiative lead:</b> Administration / Green Team	<b>Initiative start date:</b> <3 years <b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> 5 years	<b>Anticipated funding sources:</b> NJCEP, PSE&G, ESIP
<b>Departments involved:</b>  Governing Body Administration DPW Superintendent Finance	<b>Obstacles/Barriers:</b>  - Borough energy usage rates may not qualify for some incentive programs
<b>Community notes (include current status, selected measure of success):</b>  MoS: Apply for Local Government Energy Audit or Engineered Solutions audit, if eligible MoS: Achieve 20% annual energy savings for one building MoS: Achieve 20% annual energy savings across the municipal building portfolio	<b>Next steps: (specific and tangible):</b>  - Determine program eligibility - Schedule audits - Proceed with appropriate improvement program

<b>EMP Strategy:</b> 3: Maximize Energy Efficiency	<b>Initiative:</b> 2.Residential Energy Efficiency Outreach Programs	
<b>Initiative lead:</b> Green Team / Administrator	<b>Initiative start date:</b> <2 years	<b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> 1 year	<b>Anticipated funding sources:</b>	
<b>Departments involved:</b> Clerk Administration Mayor & Council Green Team	<b>Obstacles/Barriers:</b> <ul style="list-style-type: none"><li>- Identifying best media for reaching public</li><li>- Partnering with PSE&amp;G for outreach</li></ul>	
<b>Community notes (include current status, selected measure of success):</b> Current Status: N/A MoS: 5% of residents participate in Home Performance with Energy Star Program during the campaign	<b>Next steps: (specific and tangible):</b> <ul style="list-style-type: none"><li>- Prepare outreach/education materials</li><li>- Seek outreach assistance from PSE&amp;G</li><li>- Announcement about programs at regular M&amp;C meetings</li><li>- Distribute educational materials via mailings</li><li>- Post notices at municipal / school properties</li><li>- Post information on Borough web sites</li></ul>	

<b>EMP Strategy:</b> 3: Maximize Energy Efficiency	<b>Initiative:</b> 3.Commercial Energy Efficiency Outreach Campaign	
<b>Initiative lead:</b> Green Team / Administrator / Clerk	<b>Initiative start date:</b> <2 years	<b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> 1 year	<b>Anticipated funding sources:</b>	
<b>Departments involved:</b>  Clerk Administration Mayor & Council Green Team	<b>Obstacles/Barriers:</b>  - Identifying best media for reaching public - Partnering with PSE&G for outreach	
<b>Community notes (include current status, selected measure of success):</b>  Current Status: N/A MoS: 5% of business owners participating in PSE&G or BPU energy efficiency program	<b>Next steps: (specific and tangible):</b>  - Prepare outreach/education materials - Seek outreach assistance from PSE&G - Announcement about programs at regular M&C meetings - Distribute educational materials via mailings - Post notices at municipal / school properties - Post information on Borough web sites	

<b>EMP Strategy:</b> 4: Building Sector Energy and Emissions	<b>Initiative:</b> 3. Green Development Checklist	
<b>Initiative lead:</b> Green Team	<b>Initiative start date:</b> <1 year	<b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> Ongoing	<b>Anticipated funding sources:</b>	
<b>Departments involved:</b>  Land Use Board Mayor and Council Building Department Planning and Engineering Consultants	<b>Obstacles/Barriers:</b>  - Modifying model checklist for applicability to Prospect Park - Determining minimum project size required to complete checklist	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Publish Green Development Checklist MoS: Municipal ordinance requires developers to submit a completed green checklist MoS: Major new development utilizes recommendations from Green Development Checklist	<b>Next steps: (specific and tangible):</b>  -M&C to instruct Planner and Engineer to draft checklist based on model checklist(s) - Planner and Engineer to prepare checklist - Building Department to provide feedback - M&C to adopt checklist and require completion for major development	

<b>EMP Strategy:</b> 4: Building Sector Energy and Emissions	<b>Initiative:</b> 4. Conduct Outreach, New Construction	
<b>Initiative lead:</b> Administrator / Green Team	<b>Initiative start date:</b> <18 mo	<b>Priority for muni:</b> Low
<b>Anticipated initiative length:</b> Ongoing	<b>Anticipated funding sources:</b>	
<b>Departments involved:</b>  Administrator Green Team Building Department	<b>Obstacles/Barriers:</b>  Educating or encouraging developers to use NJCEP program	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Major new development utilizes NJCEP programs MoS: Information on NJCEPs new construction energy efficiency incentive programs distributed via multiple mediums	<b>Next steps: (specific and tangible):</b>  - Request marketing materials from NJCEP - Include information and materials in visible places such as in building permit PDFs, on Building Department website/office	

<b>EMP Strategy:</b> 6: Support Community Energy Planning	<b>Initiative:</b> 1. Make Community Energy Planning Inclusive	
<b>Initiative lead:</b> Mayor and Council / Land Use Board	<b>Initiative start date:</b> < 9 mos	<b>Priority for muni:</b> moderate
<b>Anticipated initiative length:</b> Ongoing	<b>Anticipated funding sources:</b> N/A	
<b>Departments involved:</b>  Mayor and Council - Clerk/Secretary Land Use Board - Secretary Green Team	<b>Obstacles/Barriers:</b>  - Language accommodations - Scheduling accommodations for varied work / lifestyles - Technological capability to allow remote participation, host meeting recordings	
<b>Community notes (include current status, selected measure of success):</b>  Boards and governing body composition is diverse MoS: Demographics of entire community represented on planning team MoS: Public comment meetings well attended	<b>Next steps: (specific and tangible):</b>  - Evaluate existing public meeting practices and consider the implications on accessibility for the public based on times of meetings, languages of published materials, public language barriers, accessibility of meeting documents before and after meeting. - Consider what reasonable accommodations can be made to allow general public to access meeting information, project information, meeting records, and communicate feedback or concerns regarding agenda items.	

<b>EMP Strategy:</b> 6: Support Community Energy Planning	<b>Initiative:</b> 2. Conduct Energy Efficiency Outreach to LMI residents	
<b>Initiative lead:</b> Administration / Green Team	<b>Initiative start date:</b> <18 months	<b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> Periodic, Ongoing	<b>Anticipated funding sources:</b>	
<b>Departments involved:</b>  Administration Green Team Clerk	<b>Obstacles/Barriers:</b>	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Hold an event specifically targeting LMI residents for energy efficiency programs MoS: 5% of eligible residents participate in income-qualifying state/utility energy efficiency programs	<b>Next steps: (specific and tangible):</b>  - Seek sponsorship/participation in a green fair or similar event from PSE&G, solar installers, other contractors and experts - Publish event on Borough website, through school and community organizations - Publish informational materials in wide range of languages	

<b>EMP Strategy:</b> 6: Support Community Energy Planning	<b>Initiative:</b> 4. Support LMI Solar Subscriptions	
<b>Initiative lead:</b> Green Team / Administration	<b>Initiative start date:</b> <2 years	<b>Priority for muni:</b> High
<b>Anticipated initiative length:</b> Ongoing	<b>Anticipated funding sources:</b> N/A	
<b>Departments involved:</b> Administration Mayor and Council	<b>Obstacles/Barriers:</b> - Obtaining buy-in from community solar developers	
<b>Community notes (include current status, selected measure of success):</b> MoS: Over 51% of community solar project capacity reserved for LMI residents MoS: Discount of 15% or more to LMI subscribers of community solar project	<b>Next steps: (specific and tangible):</b> - Stipulate LMI household capacity reservation and discounts as part of any contract with a Community Solar developer involving a public property - Stipulate LMI household capacity reservation and discounts in any Redevelopment Agreement permitting community solar - Encourage LMI household capacity reservation and discounts in Borough-wide solar-permitting ordinances for community solar	

<b>EMP Strategy:</b> 6: Support Community Energy Planning	<b>Initiative:</b> 5. Outreach to Community Serving Institutions	
<b>Initiative lead:</b> Green Team / Administration	<b>Initiative start date:</b> < 2 years	<b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> Periodic, Ongoing	<b>Anticipated funding sources:</b>	
<b>Departments involved:</b>  Mayor and Council Administration	<b>Obstacles/Barriers:</b>	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Hold an event specifically targeting community-serving institutions for energy efficiency programs MoS: In lieu of event, undertake a mailing campaign or selective outreach campaign MoS: 5% of eligible entities participate in a state/utility energy efficiency program	<b>Next steps: (specific and tangible):</b>  - Identify community serving organizations in the Borough (Borough is an opportunity zone) - Educate them about energy efficiency programs - Involve PSE&G or other advocate if available - Consider ways that energy efficiency can serve organizations' constituents	

<b>EMP Strategy:</b> 7: Expand the Clean Energy Economy	<b>Initiative:</b> 1. Install Energy Storage System
<b>Initiative lead:</b> Administrator / Green Team	<b>Initiative start date:</b> <2years <b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> N/A	<b>Anticipated funding sources:</b> NJCEP, Tax credits
<b>Departments involved:</b>  DPW Finance	<b>Obstacles/Barriers:</b>  - Cost - Selecting optimal location for installation - Qualification/timing for tax credits or incentive programs
<b>Community notes (include current status, selected measure of success):</b>  MoS: RFP for municipal energy storage system posted MoS: Energy Storage project installed and operational	<b>Next steps: (specific and tangible):</b>  - Identify desired purpose and function of an energy storage system - Identify appropriate type of energy storage system for needs - Select facility for storage system based on above - Understand requirements for tax credits and grants/reimbursements - Select mode of ownership - Install equipment and apply for grants

<b>EMP Strategy:</b> 7: Expand the Clean Energy Economy	<b>Initiative:</b> 2. Adopt Energy Storage Policies	
<b>Initiative lead:</b> Mayor and Council / Green Team	<b>Initiative start date:</b> <2 years	<b>Priority for muni:</b> Moderate
<b>Anticipated initiative length:</b> 9 months	<b>Anticipated funding sources:</b> N/A	
<b>Departments involved:</b>  Governing Body Land Use Board Building Fire chief	<b>Obstacles/Barriers:</b>  - Determining size and type of energy systems to permit - Assessing risks and capacity related to fire hazards associated with larger battery systems	
<b>Community notes (include current status, selected measure of success):</b>  MoS: Regulations adopted addressing battery energy storage MoS: Permitting system for energy storage established	<b>Next steps: (specific and tangible):</b>  - Planner, Engineer, Building Department, and Fire Department review model ordinance(s), permit(s), and checklist(s), consider goals of ordinance, negotiate issues with larger systems, draft document meeting Borough needs. - Introduced for adoption by M&C	

# APPENDIX

## 2

# IDLING REDUCTION SAVINGS CALCULATOR

# Idling Reduction Savings Calculator

For an interactive Excel version of this calculator, please go to [http://www.transportation.anl.gov/downloads/idling\\_worksheet.xls](http://www.transportation.anl.gov/downloads/idling_worksheet.xls).

## Calculate Costs for Avoidable Idling

<b>1</b>	How much fuel is used for idling? (If you don't know, see reference table on reverse.)	Realistically, how many hours each year might you use idling reduction (IR) devices instead of idling?	What is the price of fuel?	<b>Avoidable Idling Fuel Costs</b>
	<input type="text"/> gallons/hour	<input type="text"/> hours/year	<input type="text"/> /gallon	\$ <input type="text"/> /year +
	$\times$	$\times$	$=$	
	<input type="text"/> gallons/hour	<input type="text"/> hours/year	<input type="text"/> miles/gallon	<input type="text"/> miles/year
	$\times$	$\times$	$=$	
<b>2</b>				
	<input type="text"/> gallons/hour	<input type="text"/> hours/year	<input type="text"/> /mile	<input type="text"/> miles/year
	$\div$	$\div$	$=$	
<b>3</b>	How much does an oil change cost?	How many miles between oil changes?		<b>Preventive Maintenance Cost<sup>1</sup></b>
	\$ <input type="text"/> /oil change	<input type="text"/> miles/oil change	<input type="text"/> /mile	\$ <input type="text"/> /year +
	$\div$	$\div$	$\times$	$=$
			<input type="text"/> miles/year	
			$\times$	$=$
<b>4</b>	How much does an engine overhaul or new vehicle cost?	How many miles between overhauls or vehicle replacement?		<b>Overhaul or Replacement Cost<sup>1</sup></b>
	\$ <input type="text"/> /overhaul or replacement	<input type="text"/> miles/overhaul or replacement	<input type="text"/> /mile	\$ <input type="text"/> /year
	$\div$	$\div$	$\times$	$=$
			<input type="text"/> miles/year	
			$\times$	$=$
<b>5</b>	Add values in right-hand column			<b>Total Avoidable Idling Costs</b>
				\$ <input type="text"/> /year

## Calculate Costs for Idling Reduction (IR) – Device and/or Electrified Parking Space (EPS)

<b>6</b>	How much fuel is used by the IR device?	How many hours each year could you use IR devices instead of idling?*	Price of fuel (same as price listed in line 1)	Fuel cost for IR device	
	<input type="text"/> gallons/hour	<input type="text"/> hours/year	<input type="text"/> /gallon	<input type="text"/> /year	
	$\times$	$\times$	$=$	$=$	
				<input type="text"/> /year	
<b>7</b>			Maintenance cost for IR device		<b>Operating Cost for On-board IR Device</b>
			\$ <input type="text"/> /year	$+$ \$ <input type="text"/> /year	\$ <input type="text"/> /year
				$=$	
<b>8</b>	Cost per hour to plug into EPS	How many hours each year could you use EPSs instead of idling?*	Cost to plug in		<b>Total Operating Costs for IR</b>
	\$ <input type="text"/> /hour	<input type="text"/> hours/year	<input type="text"/> /year	$+$ \$ <input type="text"/> /year	\$ <input type="text"/> /year
	$\times$	$\times$	$=$	$=$	

## Calculate Savings from IR

<b>9</b>	Capital cost of on-board IR device	<b>SAVINGS</b> Line 5 – Line 8	<b>Payback Time</b>
	\$ <input type="text"/>	$\div$ \$ <input type="text"/> /year saved	<input type="text"/> years
		$=$	

<b>10</b>	<input type="text"/>	$-$	<input type="text"/>	$=$	<input type="text"/> gallons saved/year
	<b>A</b>		<b>B</b>		

\* Total number of hours from lines 6 and 8 should equal the number of hours in line 1.

<sup>1</sup> TMC Recommended Practice 1108, "Analysis of Costs from Idling and Parasitic Devices for Heavy Duty Trucks" (2003). Technology & Maintenance Council, American Trucking Associations (TMC/ATA).

# How Much Fuel Is Used for Idling?

Vehicle Type	Class	Fuel Type	Size Indicator		Idling Fuel Use (gal/h)		Source
			Engine Size (l)	GVWR (lb)	No load	With load	
Passenger Car (Ford Focus)	1	G	2	–	0.16	0.29	ANL 1
Passenger Car (Volkswagen Jetta)	1	D	2	–	0.17	0.39	ANL 1
Passenger Car (Ford Crown Victoria)	1	G	4.6	–	0.39	0.59	ANL 1 & 2
Medium Heavy Truck	6	G	5–7	19,700–26,000	0.84	–	WVU
Delivery Truck	5	D	–	19,500	0.84	1.1 <sup>1</sup>	NREL
Tow Truck	6	D	–	26,000	0.59	1.14 <sup>2</sup>	ORNL
Medium Heavy Truck	6–7	D	6–10	23,000–33,000	0.44	–	WVU
Transit Bus	7	D	–	30,000	0.97	–	ORNL
Combination Truck	7	D	–	32,000	0.49	–	ORNL
Bucket Truck	8	D	–	37,000	0.90	1.50 <sup>2</sup>	ORNL
Tractor-Semitrailer	8	D	–	80,000	0.64	1.15 <sup>3,1</sup>	TMC

D = diesel. G = gasoline. Gal = gallon(s). GVWR = gross vehicle weight rating. h = hour(s). l = liter(s). lb = pound(s). PTO = power take-off.

<sup>1</sup> High idle.

<sup>2</sup> PTO on.

<sup>3</sup> Air conditioning on.

## Sources

**ANL 1:** Stutenberg, K., and Lohse-Busch, H. "APRF [Advanced Powertrain Research Facility at Argonne National Laboratory] Conventional Vehicles Snapshot Study." Presentation to U.S. DOE, December 2, 2012.

**ANL 2:** Rask, E.; Keller, G.; Lohse-Busch, H.; et al. (2013). "Final Report: Police Cruiser Fuel Consumption Characterization." Work performed by Argonne National Laboratory for the Illinois Tollway Authority.

**NREL:** National Renewable Energy Laboratory Project Draft Final Report for the Period August 1, 2012, through March 31, 2014, "Data Collection, Testing and Analysis of Hybrid Electric Trucks and Buses Operating in California Fleets." ARB Agreement Number 11-600, NREL Contract Number FIA-12-1763, April 15, 2014.

**ORNL:** Lascrain, M.B.; Franzese, O.; Capps, G.; et al. (2012). *Medium Truck Duty Cycle Data from Real-World Driving Environments: Project Final Report* (ORNL/TM-2012/240). Work performed by Oak Ridge National Laboratory for the U.S. DOE.

**TMC:** TMC Recommended Practice 1108, "Analysis of Costs from Idling and Parasitic Devices for Heavy Duty Trucks" (2003). Technology & Maintenance Council, American Trucking Associations (TMC/ATA).

**WVU:** Khan, ABM S.; Clark, N.N.; Gautam, M.; et al. (2009). "Idle Emissions from Medium Heavy Duty Diesel and Gasoline Trucks." *Journal of the Air & Waste Management Association* (59:3) 354–359.

## Other Idling Reduction Resources

- IdleBox [www.cleancities.energy.gov/idlebox](http://www.cleancities.energy.gov/idlebox)
- IdleBase <http://cleancities.energy.gov/idlebase>
- National Idling Reduction Network News [energy.gov/eere/vehicles/vehicle-technologies-office-national-idling-reduction-network-news](http://energy.gov/eere/vehicles/vehicle-technologies-office-national-idling-reduction-network-news)
- Argonne National Laboratory <http://www.transportation.anl.gov/engines/idling.html>
- Alternative Fuels Data Center [http://www.afdc.energy.gov/conservation/idle\\_reduction\\_basics.html](http://www.afdc.energy.gov/conservation/idle_reduction_basics.html)

# **APPENDIX**

## **3**

# **MODEL SOLAR SUPPORTIVE ZONING ORDINANCE**

## GUIDANCE FOR CREATING A SOLAR FRIENDLY ORDINANCE

The purpose of this Sustainable Jersey Guidance document is to assist municipalities in crafting a solar ordinance that meets the objectives outlined in the Make Your Town EV Friendly Action and that is best suited to each community's character and land use objectives.

Discussion and sample language regarding the following areas is included in this guidance:

### **Intent/Background/Purpose**

- Address goals and benefits of solar/renewable energy

### **Definitions**

- Define solar technologies and terms

### **General Regulations**

- Address issues such as height, size, setbacks, and lot coverage

### **Permitting Fees**

- Establish permitting fees for residential rooftop solar PV installations

## INTENT/BACKGROUND/PURPOSE

- The purpose will generally highlight the benefits of solar for the community: environmental, energy security, economic, etc.
- If the ordinance is a "stand-alone" ordinance, the municipality may wish to tie the regulations back to New Jersey's Municipal Land Use Law by referencing applicable language that may apply to solar (e.g., health, safety, welfare).

### **This section should:**

- Clarify a municipality's rationale for establishing a solar energy ordinance in language that is compatible with existing local land use plans and zoning code.
- Clarify the types of solar systems the municipality is protecting through the ordinance (small-scale, utility scale, etc.).

### **Sample Language for Intent/Background/Purpose:**

*The purpose of this Ordinance is to provide a clear-cut regulatory system for solar energy, a renewable and non-polluting energy resource that reduces fossil fuel emissions, including greenhouse gases that contribute to global climate change. The specific goals of the [Master Plan/Climate Plan] of [Municipality] support renewable energy and the use of solar energy is encouraged by New Jersey legislation.*

OR

*The purpose of the Ordinance is to facilitate the construction, installation and operation of Solar Energy Facilities in [Municipality] in a manner that protects public health, safety and welfare and avoids significant impacts to protected resources such as important agricultural lands, endangered*

*species, high value biological habitats and other protected resources. It is the intent of this ordinance to encourage solar facilities that reduce reliance on fossil fuels, increase local economic development and job creation, reduce greenhouse gas emissions, assist New Jersey in meeting its Renewable Portfolio Standards, and/or promote economic development diversification.*

OR

*The purpose of this ordinance is to provide a regulatory framework for the construction of Solar Energy Systems in [Municipality], subject to reasonable restrictions, which will preserve the public health, safety, and welfare, while also maintaining the character of [Municipality].*

OR

*The purpose of this ordinance is to provide for the use of solar energy, including specifications related to the land development, installation and construction of solar energy systems in [Municipality], subject to reasonable conditions to protect the public health, safety, and welfare. This section applies to solar energy systems to be installed and constructed on any property.*

### **What NOT to do**

Purpose sections should not:

- include specific goals such as number of megawatts (MW) or number of projects;
- make reference to specific types of technology that could quickly become outdated or impractical.

Not specifying PV system size and/or technology allows for innovation and advancement in PV technology where a smaller amount of land or roof space could result in a larger capacity system (as measured in W or kW).

## **DEFINITIONS**

- Each municipality should consider its requirements for the types of solar facilities it envisions for its community when considering which definitions to utilize in the Ordinance.
- Any term used in the text of the ordinance must be defined. The definition of each term can greatly impact how an ordinance is enforced; providing accurate definitions of these terms will ensure clarity in the enforcement of the ordinance. Definitions may be included in the body of the alternative energy ordinance, if it is a stand-alone ordinance, or may be incorporated into the Definitions section of the solar ordinance.

### **This section should:**

- Clearly define each term specific to solar energy systems included in the ordinance.
- Provide separate definitions for small scale accessory use (Solar Energy System) and utility scale principal use (Solar Energy Facility) so that they can be regulated distinctly.
- Provide definitions of solar energy system types such as: roof-mounted, ground-mounted, and building-integrated.

**Sample Language for Definitions:**

- **Solar Energy System – Accessory Use**

*An energy system that consists of one or more solar collection devices, solar energy related “balance of system” equipment, and other associated infrastructure with the primary intention of generating electricity, storing electricity, or otherwise converting solar energy to a different form of energy. Solar energy systems may generate energy in excess of the energy requirements of a property only if it is to be sold back to a public utility in accordance with the NJ Net Metering law [see Note below on net-metering in New Jersey].*

OR

*A solar energy system – accessory use consists of one (1) or more photovoltaic, concentrated solar thermal, or solar hot water devices either free-standing ground, building integrated or roof mounted, as well as related equipment which is intended for the purpose of reducing or meeting the energy needs of the property’s principal use.*

These definitions include physically what a solar energy system is (can be solar hot water or PV), how it is to be used.

These definitions apply only to accessory use systems. These definitions do not allow utility-scale use.

Note on net-metering in New Jersey:

- Net metering helps customers maximize their renewable energy investments. It enables customers to obtain full retail credits on their utility bill for each kWh of electricity their system produces up to 100% of their electricity usage over the course of a year.
- When a renewable energy system produces more electricity than the customer actually uses, the customer will be compensated with credits at the full retail value of the electricity for the production over and above what they use. For example, on a typical sunny day at moderate temperatures, a customer with a solar system may use less electricity than the system actually generates. When electricity production exceeds usage, the utility meter will spin backwards and provide the customer with credits for the excess energy produced. These credits can be used by customers as needed.
- For more information, see: <http://www.njcleanenergy.com/renewable-energy/programs/net-metering-and-interconnection>

- **Solar Energy Facility – Principal Use**

*An alternative energy facility that consists of one or more ground-mounted, free-standing, or building-integrated solar collection devices, solar energy related equipment and other associated infrastructure with the primary intention of generating electricity or otherwise converting solar energy to a different form of energy for primarily off-site use.*

OR

*An area of land or other area (e.g. parking lot canopy, landfill, brownfield, etc.) used for a solar collection system principally used to capture solar energy, convert it to electrical energy or thermal power and supply electrical or thermal power primarily for off-site use. Principal solar energy systems consist of one (1) or more free-standing ground, or roof mounted solar collector devices, solar related equipment and other accessory structures and buildings including light reflectors, concentrators, and heat exchangers, substations, electrical infrastructure, transmission lines and other appurtenant structures.*

- This definition applies to ordinances that choose to address utility-scale solar energy facilities. Such facilities would be considered a principal use.

- **Ground-Mounted Solar Energy System**

*A solar energy system that is directly installed on solar racking systems, which are attached to an anchor in the ground and wired to connect to an adjacent home or building. Ground-mounted systems may be appropriate when insufficient space, structural and shading issues, or other restrictions prohibit rooftop solar.*

- A ground mounted solar energy system is a subset or particular type of solar energy system that may require additional restrictions or review. Municipalities may wish to impose specific regulations on ground-mounted solar energy systems, in which case, a definition would be important to include.

- **Solar Farm or Solar Garden**

*A set of solar collection devices designed to capture sunlight and convert it to electricity primarily for offsite consumption and use; some electricity may be used by an onsite building or structure.*

- Solar gardens can be designed as community solar systems in which community members can own shares in the solar system; subscribe to receive the generated solar power; or can purchase the output of the solar system to offset their own utility bills. [Sample language for solar gardens from: Southern NH Planning Commission. Solar Friendly Best Planning Practices, p. 4: [snhpc.org/pdf/FinalSolarResourceGuide2015.pdf](http://snhpc.org/pdf/FinalSolarResourceGuide2015.pdf)]

### **What NOT to do**

- Definition section should not specify the electrical size of the PV system (i.e. defining a small scale system as equal to or less than 100 kW). Not specifying PV system size allows for innovation and advancement in PV technology where a smaller amount of land or roof space could result in a larger capacity system (as measured in W or kW).
- Definitions sections should not address concerns about system siting; these concerns should be addressed through appropriate use, setback, or height restrictions to ensure that the land use and siting goals are met no matter the system size. This allows more flexibility to those who wish to site or install solar on their roof.

## GENERAL REGULATIONS

The general regulations are guidelines or added requirements that may be integrated into the local review process. This section of the ordinance can present regulations that the municipality may include in the ordinance, such as height, setbacks, aesthetics/screening, and impervious coverage.

### **This section should clarify approval standards that:**

- may be imposed upon specific types of solar energy systems (i.e., ground-mounted/freestanding versus roof-mounted);
- may be imposed upon specific districts; or
- may be generally applied to all solar energy systems.

### **Setbacks**

**Ground-Mounted:** For ground-mounted solar energy systems, setback requirements can help alleviate aesthetic and safety concerns, yet overly restrictive setback requirements can limit the available space in which a solar PV array can be sited. Since solar PV panels rely on adequate access to sunlight, municipalities may want to consider easing setback requirements for ground-mounted solar PV systems.

### **Sample Language for Ground-Mounted:**

*The location of the Ground-Mounted System shall meet all applicable accessory-use setback requirements of the zoning district in which it is located.*

OR

*All Ground-Mounted Systems shall be set back a distance of \_\_\_\_ feet from any property line in a residential zoning district or in conformance with the area and bulk standards for accessory structures in commercial districts as provided herein.*

OR

*Ground-Mounted Systems shall not be permitted in a front yard unless the applicant demonstrates that the rear yard locations will not result in acceptable solar access.*

**Roof-Mounted:** Setback regulations for roof-mounted systems can ensure that adequate pathways exist for access along roof edges and ridge lines for first responders in case of a fire or for maintenance crews in the case of system repair. The minimum construction requirements can be found in the NJ Editions of the National Electrical Code, International Building Code (and by reference, International Fire Code), and International Residential Code, as applicable. Items not covered within these codes may be added to a local ordinance.

### **Sample Language for Roof-Mounted:**

*The design of the solar energy system shall conform to applicable local, state and national solar codes and standards. A building permit reviewed by department staff shall be obtained for a*

*solar energy system. All design and installation work shall comply with all applicable provisions in the National Electric Code (NEC), the International Residential Code (IRC), International Commercial Building Code, State Fire Code, and any additional requirements set forth by the local utility (for any grid-connected solar systems). [Sample language from: Solar Simplified, p. 9: [solarsimplified.org/zoning/solar-zoning-toolbox/solarzoningordinance](http://solarsimplified.org/zoning/solar-zoning-toolbox/solarzoningordinance)]*

**Height:** Height regulations can help alleviate local land use concerns over aesthetics (e.g. how much of the system can be seen from the street). However, height restrictions can prevent a solar PV system from being installed if the building on which it is sited is already at maximum allowed height if the municipality does not specify an exemption for the system in its ordinance. Separate height language options are provided for sloped and flat roofs. In communities with both sloped and flat roof types, it may be most appropriate to include separate regulations by roof type.

#### **Sample Language for Height Regulations:**

##### ***Height – Sloped Roof***

*For a roof-mounted system installed on a sloped roof, the highest point of the system shall not exceed the highest point of the roof to which it is attached as allowed by setback requirements.*

##### ***Height – Flat Roof***

*For a roof-mounted system installed on a flat roof, the highest point of the system shall be permitted to exceed the district’s height limit by up to fifteen (15) feet above the rooftop to which it is attached.*

##### ***Height – Ground-Mounted***

*Ground-mounted or freestanding solar energy systems shall not exceed applicable maximum accessory structure height in the zoning district in which the solar energy system is located.*

##### ***Height – Parking Canopies***

*A solar energy system may exceed the applicable maximum accessory structure height if it will cover an impervious surface parking area. Height may not exceed the height of the primary structure that the parking area serves. Minimum height of the parking canopy must allow clearance for emergency service and service vehicles.*

#### **What NOT to do**

If an ordinance is designed and enforced properly, the height and setback restrictions should alleviate aesthetic concerns about solar PV systems. Therefore, municipalities should not over-regulate for aesthetic concerns such as:

- conspicuous panels that are visible from the street,
- conspicuous equipment tied to the panels, or
- glare.

## SPECIAL CONSIDERATIONS: HISTORIC DISTRICTS

Municipalities with historic districts should work with their Historic Preservation Commission to determine whether there will be restrictions on solar PV installations in historic districts that will require review. If design guidelines, siting restrictions, or review requirements exist, they should be laid out explicitly in the ordinance to ensure that a clear and understandable review process is known to the applicant. Review processes add time and added labor cost through delayed installations, so municipalities should attempt to make solar provisions for historic districts minimally restrictive. Below are two examples of design guidelines for installing solar on historic properties.

- **Implementing Solar PV Projects on Historic Buildings and in Historic Districts**, National Renewable Energy Laboratory:  
[www.nrel.gov/docs/fy11osti/51297.pdf](http://www.nrel.gov/docs/fy11osti/51297.pdf)
- **Installing Solar Panels on Historic Buildings**, North Carolina Solar Center:  
[nccleantech.ncsu.edu/wp-content/uploads/Installing-Solar-Panels-on-Historic-Buildings\\_FINAL\\_2012.pdf](http://nccleantech.ncsu.edu/wp-content/uploads/Installing-Solar-Panels-on-Historic-Buildings_FINAL_2012.pdf)
- **Solar Panels on Historic Properties**, National Park Service:  
[www.nps.gov/tps/sustainability/new-technology/solar-on-historic.htm](http://www.nps.gov/tps/sustainability/new-technology/solar-on-historic.htm)

### Sample Language for Historic Districts:

*Solar energy systems within a historic district or on a historic resource property are not permitted unless written approval or a Certificate of Appropriateness has been granted by the Historic Preservation Commission as established by [historic preservation ordinance].*

OR

*All solar energy systems/facilities within [historic district/overlay/etc.] or on a historic resource property as defined by [the municipal inventory/register/etc.] must follow the administrative procedures required by [historic preservation ordinance].*

## SPECIAL CONSIDERATIONS: TREES

While it is true that shade of any kind interferes with a solar energy system's ability to operate, removing trees to install solar technology is generally not recommended. However, there are legitimate arguments for and against removing trees to accommodate solar panels. There is no clear right answer and much of the calculus depends on the values and objectives of each community. Municipalities are encouraged to consider if this is an issue warranting local regulation. If there is an existing tree protection ordinance, for example, the municipality can determine if solar panels should be given any special consideration and amend the ordinance accordingly.

## PERMITTING FEES

Using a flat-fee method instead of a value-based method to assess permit fees streamlines the process and ensures that larger residential solar energy systems are not arbitrarily penalized. Fees should fairly reflect the time needed for city staff to review and issue a permit as these costs to the municipality remain constant regardless of system size for standard residential roof-mounted arrays.

### **The permitting fee ordinance should:**

Establish reasonable residential permit fees in line with NJAC 5:23-4.20:

*NJAC 5:23-4.20 (c) 2. iii. (13) For photovoltaic systems, the fee shall be based on the designated kilowatt rating of the solar photovoltaic system as follows:*

- (A) One to 50 kilowatts, the fee shall be \$ 65.00;*
- (B) Fifty-one to 100 kilowatts, the fee shall be \$ 129.00; and*
- (C) Greater than 100 kilowatts, the fee shall be \$ 640.00.*

The municipality should strive to set a fee that covers the cost of average plan review and inspections. To set the fee, the municipality can multiply the billable hourly rates for staff involved in the review process that can be expected for 80% of permit submittals. Examples of these calculations are provided in the Department of Energy SunShot document *Best Management Practices for Solar Installation*, which can be found at: [marc.org/Environment/Energy/pdf/BMP-Process-Step-2-1-A-Standardize-Permit-Fees.aspx](http://marc.org/Environment/Energy/pdf/BMP-Process-Step-2-1-A-Standardize-Permit-Fees.aspx)

### **What NOT to do**

Fees based on the size or value of the solar PV installation unfairly penalize homeowners even though the cost to process the permit application for both systems is approximately the same. For example, the permit application for a smaller residential solar PV system costs the municipality approximately the same amount to process as a larger residential solar PV system, but a value-based fee structure can result in higher fees being assessed for the larger system. Fees should be set that reflect the time needed for staff to process the application.

## Resources

### Zoning and Permitting Background Documents

American Planning Association (APA). Briefing Papers #3: Integrating Solar into Local Plans.  
[www.planning.org/research/solar/briefingpapers/localplans.htm](http://www.planning.org/research/solar/briefingpapers/localplans.htm)

American Planning Association (APA). Briefing Papers #4: Integrating Solar into Local Development Regulations.  
[www.planning.org/research/solar/briefingpapers/localdevelopmentregulations.htm](http://www.planning.org/research/solar/briefingpapers/localdevelopmentregulations.htm)

American Planning Association (APA). Briefing Papers #5: Balancing Solar Energy Use with Potential Competing Interests. [includes guidance on historic districts and trees]  
[www.planning.org/research/solar/briefingpapers/potentialcompetinginterests.htm](http://www.planning.org/research/solar/briefingpapers/potentialcompetinginterests.htm)

Delaware Valley Regional Planning Commission. Renewable Energy Ordinance Framework for Solar PV.  
[www.dvrpc.org/EnergyClimate/ModelOrdinance/Solar/pdf/2016\\_DVRPC\\_Solar\\_REOF\\_Reformatted\\_Final.pdf](http://www.dvrpc.org/EnergyClimate/ModelOrdinance/Solar/pdf/2016_DVRPC_Solar_REOF_Reformatted_Final.pdf)

EnergizeCT. Connecticut Rooftop Solar PV Permitting Guide.  
[www.energizect.com/sites/default/files/uploads/%281%29%20CT%20Rooftop%20Solar%20PV%20Permitting%20Guide%20v1.0.pdf](http://www.energizect.com/sites/default/files/uploads/%281%29%20CT%20Rooftop%20Solar%20PV%20Permitting%20Guide%20v1.0.pdf)

Grow Solar. Creating “Solar Ready” Communities: Three State Regional Analysis (Minnesota, Wisconsin, Illinois). [www.growsolar.org/wp-content/uploads/2015/05/Three-State-Regional-Analysis.pdf](http://www.growsolar.org/wp-content/uploads/2015/05/Three-State-Regional-Analysis.pdf)

Interstate Renewable Energy Council (IREC) and VoteSolar. Project Permit: Best Practices in Residential Solar Permitting.  
[projectpermit.org/wp-content/uploads/2013/05/Solar-Permitting-Best-Practices\\_May2013.pdf](http://projectpermit.org/wp-content/uploads/2013/05/Solar-Permitting-Best-Practices_May2013.pdf)

Interstate Renewable Energy Council (IREC). Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained.  
[www.irecusa.org/publications/residential-solar-permitting-best-practices-explained/](http://www.irecusa.org/publications/residential-solar-permitting-best-practices-explained/)

Massachusetts Department of Energy Resources. Questions and Answers: Ground-Mounted Solar Photovoltaic Systems.  
[www.mass.gov/eea/docs/doer/renewables/solar/solar-pv-guide.pdf](http://www.mass.gov/eea/docs/doer/renewables/solar/solar-pv-guide.pdf)

Metropolitan Area Planning Council (MAPC, Massachusetts). Guide to Streamlining the Solar PV Permitting Process and Developing Supportive Zoning Bylaws.  
[www.mapc.org/system/files/bids/Solar%20Permitting%20and%20Zoning%20Bylaws.pdf](http://www.mapc.org/system/files/bids/Solar%20Permitting%20and%20Zoning%20Bylaws.pdf)

Minnesota. Local Government Solar Toolkit: Planning, Zoning, and Permitting.  
[www.cleanenergyresourceteams.org/sites/default/files/MinnesotaPZPToolkit1.pdf](http://www.cleanenergyresourceteams.org/sites/default/files/MinnesotaPZPToolkit1.pdf)

State of Washington Department of Commerce. Planning and Zoning: Opportunities for Local Governments to Support Rooftop Solar.  
[nwsolarcommunities.org/wp-content/uploads/2013/05/ESSP\\_PlanningZoning.pdf](http://nwsolarcommunities.org/wp-content/uploads/2013/05/ESSP_PlanningZoning.pdf)

U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy (EERE). Solar Powering Your Community: A Guide for Local Governments.  
[www1.eere.energy.gov/solar/pdfs/47692.pdf](http://www1.eere.energy.gov/solar/pdfs/47692.pdf)

### ***Sample Zoning Ordinances***

Borough of Glassboro (Gloucester County, NJ). Chapter 107. Development Regulations. Article IV. Design and Performance Standards. § 107-72. Solar energy systems. [Added 9-8-2009 by Ord. No. 09-45]  
[ecode360.com/12606957](http://ecode360.com/12606957)

City of Chicago Solar Zoning Ordinance.  
[www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable\\_Development/Publications/City\\_of\\_Chicago\\_Solar\\_Zoning\\_Policy\\_Updated.pdf](http://www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable_Development/Publications/City_of_Chicago_Solar_Zoning_Policy_Updated.pdf)

Southern New Hampshire Planning Commission. Solar Friendly Best Planning Practices for New Hampshire Communities: A Quick Resource Guide for Planning Boards and Municipal Officials in Crafting Solar Friendly Regulations and Developing Solar Friendly Communities in New Hampshire.  
[www.snhpc.org/pdf/FinalSolarResourceGuide2015.pdf](http://www.snhpc.org/pdf/FinalSolarResourceGuide2015.pdf)

Utah Clean Energy. Solar Simplified Model Solar Zoning Ordinance.  
[www.solarsimplified.org/permitting/solar-zoning-toolbox](http://www.solarsimplified.org/permitting/solar-zoning-toolbox)

Western Pennsylvania Rooftop Solar Challenge. Solar Installation Guidebook.  
[www.pennfuture.org/Files/News/SunSHOT\\_Guide.compressed.pdf](http://www.pennfuture.org/Files/News/SunSHOT_Guide.compressed.pdf)

[NAME OF MUNICIPALITY]

COUNTY OF [NAME OF COUNTY], NEW JERSEY

ORDINANCE XXX

AN ORDINANCE SUPPORTING SOLAR ENERGY SYSTEMS

BE IT ORDAINED by the Township Committee of the [name of municipality], in the County of [name of county] and State of New Jersey,

#### SECTION 1 PURPOSE OF ORDINANCE

Facilitation of the construction, installation and operation of Solar Energy Systems in [name of municipality], subject to reasonable restrictions, which will preserve the public health, safety, and welfare, while also maintaining the character of the Township and avoid significant impacts to protected resources such as important agricultural lands, endangered species, high value biological habitats and other protected resources. It is the intent of this ordinance to encourage solar facilities that reduce reliance on fossil fuels, increase local economic development and job creation, reduce greenhouse gas emissions, assist New Jersey in meeting its Renewable Portfolio Standards, and/or promote economic development diversification.

#### SECTION 2 DEFINITIONS

A. Solar Energy System—Accessory Use - a solar energy system—accessory use consists of one (1) or more photovoltaic, concentrated solar thermal, or solar hot water devices either free-standing ground, building integrated or roof mounted, as well as related equipment which is intended for the purpose of reducing or meeting the energy needs of the property's principal use.

B. Solar Energy Facility —Principal Use - An alternative energy facility that consists of one or more ground-mounted, free-standing, or building-integrated solar collection devices, solar energy related equipment and other associated infrastructure with the primary intention of generating electricity or otherwise converting solar energy to a different form of energy for primarily off-site use.

C. Ground-Mounted Solar Energy System - A solar energy system that is directly installed on solar racking systems, which are attached to an anchor in the ground and wired to connect to an adjacent home or building. Ground-mounted systems may be appropriate when insufficient space, structural and shading issues, or other restrictions prohibit rooftop solar.

D. Solar Farm or Solar Garden — A set of solar collection devices designed to capture sunlight and convert it to electricity primarily for offsite consumption and use; some electricity may be used by an onsite building or structure. Solar gardens can be designed as community solar systems in which community members can own shares in the solar system; subscribe to receive the generated solar power; or can purchase the output of the solar system to offset their own utility bills.

#### SECTION 3 GENERAL REGULATIONS

- A. All solar energy systems shall be designed, erected and installed in accordance with all applicable provisions in the National Electric Code (NEC), the International Residential Code

(IRC), International Commercial Building Code, State Fire Code, and any additional requirements set forth by the local utility (for any grid-connected solar systems) .

- B. Solar energy systems are permitted in all zoning districts as an accessory use to permitted, conditional and special exception uses with appropriate building permit.
- C. Principal use solar energy facilities, solar farms and gardens must be in accordance with applicable laws and regulations.
- D. Setbacks Ground-Mounted: The location of the Ground-Mounted System shall meet all applicable accessory-use setback requirements of the zoning district in which it is located.
- E. Height -Sloped Roof: For a roof-mounted system installed on a sloped roof, the highest point of the system shall not exceed the highest point of the roof to which it is attached as allowed by setback requirements.
- F. Height -Flat Roof: For a roof-mounted system installed on a flat roof, the highest point of the system shall be permitted to exceed the district's height limit by up to fifteen (15) feet above the rooftop to which it is attached.
- G. Height —Ground-Mounted: Ground-mounted or freestanding solar energy systems shall not exceed applicable maximum accessory structure height in the zoning district in which the solar energy system is located.
- H. H. Height -Parking Canopies: A solar energy system may exceed the applicable maximum accessory structure height if it will cover an impervious surface parking area. Height may not exceed the height of the primary structure that the parking area serves. Minimum height of the parking canopy must allow clearance for emergency service and service vehicles.

#### SECTION 4 SPECIAL CONSIDERATIONS: HISTORIC DISTRICTS

Solar energy systems within a historic district or on a historic resource property are not permitted unless written approval or a Certificate of Appropriateness has been granted by the Historic Preservation Commission as established by [name of municipality].

#### SECTION 5 SOLAR READY ZONING

Solar ready zoning should be considered as one among multiple considerations in planning new developments.

#### SECTION 6 PERMITTING FEES

Established in line with NJAC 5:23-4.20: NJAC5:23-4.20 (c) 2.iii. (13) For photovoltaic systems, the fee shall be based on the designated kilowatt rating of the solar photovoltaic system as follows:

- A. One to 50 kilowatts, the fee shall be \$ 65.00;
  - B. Fifty-one to 100 kilowatts, the fee shall be \$ 129.00;
- and
- C. Greater than 100 kilowatts, the fee shall be \$ 640.00.

# APPENDIX

## 4

### BOULDER, CO SOLAR PV SYSTEM CHECKLIST



**Boulder County  
Community Planning  
& Permitting  
Publications**

# Solar Photovoltaic Systems Checklist

**Community Planning & Permitting**  
Courthouse Annex Building  
2045 13th Street  
PO Box 471  
Boulder, CO 80302

**Building Safety &  
Inspection Services:**  
EZBP & License Applications,  
Reports & Letters  
ezbp@bouldercounty.org  
303-441-3926

**Plan Review & Building Code Questions:**  
building@bouldercounty.org  
720-564-2640  
www.bouldercounty.org

## Solar Photovoltaic Systems Checklist

Per 2020 NEC (National Electrical Code)

Solar photovoltaic applications are reviewed by the county electrical inspectors. The following checklist shall be submitted with your plans. Each item on the list shall be marked to verify it is part of the submittal. Incomplete information may result in plan rejection or delay in the approval of your project.

All accessory ground-mounted solar arrays require Site Plan Review Waiver (SPRW) approval as a part of the permit application.

### Plan Submittal Requirements

#### All ground mounted systems require:

- A completed Building Permit application form. Include the proposed PV system capacity in watts, and whether system is a stand-alone, grid-tied, or hybrid system.
- A deposit (the balance of fees is due at the time of permit issuance).
- Electronic PDF files are to be submitted to Building Safety & Inspection Services through the Online Application Submittals webpage at [www.boco.org/\\_CPP-application-submittal](http://www.boco.org/_CPP-application-submittal). Minimum drawing scale is 1/4" per foot.

#### For roof mounted residential systems:

- A completed EZBP application form.
- Electronic PDF files are to be submitted to Building Safety & Inspection Services through the Online Application Submittals webpage at [www.boco.org/\\_CPP-application-submittal](http://www.boco.org/_CPP-application-submittal). Minimum drawing scale is 1/4" per foot.

### Site Plan - Equipment Outside a Building

- Show the location of all disconnects.
- Show the location of all batteries.
- Show the location of inverters.
- Show the location and connection of all grounding electrode conductors.
- Show the clearances around all equipment.
- Show dimensions between equipment and structures.
- Show dimensions between equipment and property lines.
- Show the layout of all the arrays and the required minimum access and pathways per section R324 of the Boulder County Building Code Amendments.

**Note:** See the Pole or Ground Mounted Panels section on page 2 for additional site plan requirements.

### Floor Plan - Equipment Within a Building

- Show the location of all disconnects.
- Show the location of all batteries.
- Show the location of inverters.
- Show the location and connection of all grounding electrode conductors.
- Show location of all equipment within structures.
- Label the use of the room in which the equipment is placed.
- Show clearances of the equipment.

*Plan Submittal Requirements continued on page 2*

## Wiring Requirements

- Provide a one-line diagram that includes the following information:
- Label whether the system is stand-alone, grid-tied, or hybrid.
- Conductor sizes.
- Conductor insulation types (i.e., THHN, THWN, direct burial cable, etc.).
- Conductor material (i.e., copper/aluminum).
- Conduit sizes.
- Conduit material (i.e., non-metallic, EMT, etc.).
- Over current device ratings.
- Existing and new panel amperage ratings (buss ratings).
- Series and parallel configuration of the module connections.

## Equipment Requirements

- Provide product listing sheets for all equipment with the following information:
- Module short circuit current ratings.
- Module open circuit voltage ratings.
- Module series fuse ratings.
- Inverter output circuit current rating.
- Inverter UL listings.
- All associated documentation (i.e., batteries, inverters, disconnects, modules, charge controllers, over-current devices etc.).
- Method of grounding for modules and array.
- Projected kWh/year for the system.

**Note:** Voltage correction factor is based on 125% (2020 NEC Table 690.7).

## Panels

### Roof Mounted Panels

Provide the following information:

- An Engineer's evaluation regarding the dead-load capability of the existing roof structure and its ability to support the added weight of the solar photovoltaic system. The Engineer must reference the required wind and snow load for the site. If the panels project above the ridge line of the roof, this must also be part of engineers evaluation.
- For flat roof installations provide method of repair for roof penetrations.

### Pole or Ground Mounted Panels

Provide the following information:

- Site Plan to include the following:
  - Location of panel(s) on property.
  - Dimensions from panel(s) to property lines.
  - Dimensions from panel(s) to other structures on the property and property easements.
- Engineered footing design.

### Rough Solar PV Inspections

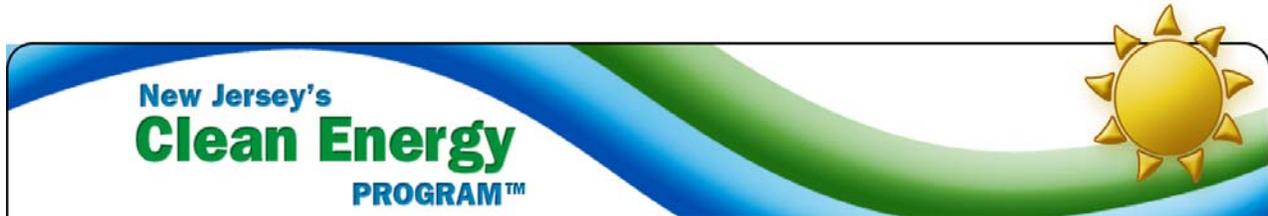
Beginning Feb. 1, 2011, Boulder County began doing rough solar PV inspections. This inspection should be scheduled after the installation of the solar PV racking system, grounding, and no more than 50% of the PV modules. Roof mounted junction boxes or DC combiner boxes shall also be installed and wires terminated. In addition to the rough inspection, at the completion of the work, Building Safety and Inspection Services will conduct a final inspection.

If you have questions, contact Boulder County Building Safety & Inspection Services at 720-564-2640, or email [building@bouldercounty.org](mailto:building@bouldercounty.org).

# APPENDIX

## 5

# MODEL WIND ORDINANCE



DRAFT v5, 11/19/07

## Toward the Development of a Model Ordinance Addressing Small Wind Energy Systems for New Jersey Municipalities

The Office of Clean Energy in the Board of Public Utilities has been funded by the US Department of Energy as part of the Wind Powering America Initiative to organize and facilitate a statewide Wind Working Group for New Jersey. The New Jersey Small Wind Working Group was initiated in October 2006 with a well attended organizational meeting that included representatives of New Jersey's small wind industry, environmentalists, residents, and several universities. During the initial meeting, a Strength Weakness Opportunity Threat (SWOT) exercise was conducted which identified local land use barriers and financial issues as the top impediments to more wide spread adoption of small wind energy generation systems in New Jersey.

As a result of this identified need, the Office of Clean Energy has worked with the USDOE and members of the New Jersey Small Wind Working Group toward overcoming local land use barriers. On May 11, 2007, a meeting of the Small Wind Working was convened to discuss the issue and develop a strategy for mitigating the impact of overly restrictive codes and ordinances. The USDOE recommended and funded the facilitation of the meeting by Mick Sagrillo one of foremost experts on the issue of land use restrictions in home rule states and co-author of the NREL report titled, "Zoning for Distributed Wind Power; Breaking Down Barriers". The strategy recommended by the NJSWWG members includes;

- developing a model ordinance specific for New Jersey among a working group of NJSWWG members
- distributing the small wind energy system model ordinance to relevant agencies and organizations for review toward consistency with existing New Jersey state law and policy, such as NJDEP, NJ Audubon, NJ League of Municipalities, NJDCA, etc.
- develop a cover sheet listing all agencies that have reviewed the document and deemed it consistent with NJ law and policy,
- distribute the resulting NJ Small Wind Energy System Model Ordinance to targeted County and municipal officials toward local adoption, and
- make the NJ Small Wind Energy System Model Ordinance with cover sheet available on the NJ SWWG website for small wind installer use as a Conditional Use Permit in overcoming local opposition specific to an application.

The following pages include the 5<sup>th</sup> version of the draft New Jersey Small Wind Energy System Model Ordinance.

## **Draft New Jersey Small Wind Energy System Ordinance**

**Note: This ordinance was funded in part through a grant provided by the USDOE Wind Powering America Program**

**The following agencies and organizations provided input for the development of the Small Wind Energy System Ordinance:**

- New Jersey Board of Public Utilities, Office of Clean Energy
- Rutgers the State University, Center for Advanced Energy Systems
- Rowan University

**The following people helped develop and reviewed the Small Wind Energy System Ordinance:**

- Michael Winka, Director, Office of Clean Energy, New Jersey Board of Public Utilities
- Peter Mark Jansson, Rowan University
- Michael Muller, Rutgers Center for Advanced Energy Systems
- Jan Harris and Steve Weiss, NJCEP Renewable Energy Market Managers
- Roger Dixon President, Skylands Renewable Energy
- Michael Mercurio, President, Island Wind
- Jim Fry, Resident of Ocean Gate

**The Small Wind Energy System Ordinance was developed as a permitted use ordinance, as we were advised that this would be the appropriate ordinance to draft. The ordinance can be simply used as a conditional use permit for a small wind turbine by inserting the following sections into the municipal zoning ordinance:**

- 00.05 Standards**
- 00.06 Permit Requirements**
- 00.07 Abandonment**

The draft New Jersey Small Wind Energy System Ordinance is intended to be used as a zoning ordinance. Users of the ordinance for wind energy systems must receive all necessary permits from the NJ Department of Environmental Protection (DEP). Compliance with the ordinance does not constitute compliance with DEP rules for those permits nor does it constitute compliance with the Uniform Construction Code (N.J.A.C. 5:23).

The following model ordinance language could be used by municipalities to edit for their particular circumstance.

**WHEREAS**, it is the purpose of this ordinance to promote the safe, effective and efficient use of small wind energy systems to reduce the on-site consumption of utility-supplied electricity; and

**WHEREAS**, the (above mentioned organizations and individuals) find that:

- 1) Wind energy is an abundant, renewable, and nonpolluting energy resource;
- 2) Converting wind to electricity will reduce our dependence on nonrenewable energy resources, and decrease the air and water pollution that results from the use of conventional energy sources;
- 3) Distributed small wind energy systems will also enhance the reliability and power quality of the power grid, reduce peak power demands, and help diversify the State's energy supply portfolio; and
- 4) Small wind energy systems make the electricity supply market more competitive by promoting customer choice; and

**WHEREAS**, New Jersey's Renewable Portfolio Standards (RPS) require each supplier/provider, as defined at N.J.A.C. 14:8-1.2, that sells electricity to retail customers in New Jersey to provide a percentage of their retail electricity sales from renewable energy sources, beginning at 3.5 percent in 2004 and increasing to 22.5 percent by 2021; and

**WHEREAS**, existing local zoning regulations do not address wind power, which while not intended to discourage the installation of small wind turbines, can substantially increase the time and costs required to obtain necessary local land-use permits; and

**WHEREAS**, the (insert governing body) of (insert City or Town) find that it is necessary to standardize and streamline the requirements for small wind energy systems so that this clean, renewable energy resource can be utilized in a cost-effective and timely manner in our municipality.

**NOW, THEREFORE BE IT RESOLVED**, by the (insert governing body) that:

**00.01 Title.**

This ordinance may be referred to as the Small Wind Energy System Ordinance.

**00.02 Authority.**

This ordinance is adopted pursuant to (insert City or Town) authority.

**00.03 Purpose.**

The purpose of this ordinance is to:

- (1) Facilitate the permitting of small wind energy systems.

(2) Preserve and protect public health and safety without significantly increasing the cost or decreasing the efficiency of a small wind energy system.

#### **00.04 Definitions.**

In this ordinance:

(1) “Administrator” means the (County or Town) Land Use Administrator or Planning and Zoning Administrator.

(2) “Board” means the (County or Town) or other Authority Having Jurisdiction.

(3) “Meteorological tower” or “met tower” means a structure designed to support the gathering of wind energy resource data , and includes the tower, base plate, anchors, guy cables and hardware, anemometers (wind speed indicators), wind direction vanes, booms to hold equipment anemometers and vanes, data logger, instrument wiring, and any telemetry devices that are used to monitor or transmit wind speed and wind flow characteristics over a period of time for either instantaneous wind information or to characterize the wind resource at a given location.

(4) “Owner” shall mean the individual or entity that intends to own and operate the small wind energy system in accordance with this ordinance.

(5) “Rotor diameter” means the cross sectional dimension of the circle swept by the rotating blades of a wind-powered energy generator.

(6) “Small wind energy system” means a wind energy system, as defined in this section, that

(a) is used to generate electricity;

(b) has a nameplate capacity of 100 kilowatts or less; and

(c) is as high as necessary to capture the wind energy resource at (insert height for residential\_\_\_ industrial\_\_\_ commercial \_\_\_ or agricultural\_\_\_ ) use.

(7)“Total height” means, in relation to a wind energy system, the vertical distance from the ground to the tip of a wind generator blade when the tip is at its highest point.

(8) “Tower” means a monopole, freestanding, or guyed structure that supports a wind generator.

(9) “Wind energy system” means a wind generator and all associated equipment, including any base, blade, foundation, nacelle, rotor, tower, transformer, vane, wire, inverter, batteries or other component necessary to fully utilize the wind generator.

(10) “Wind generator” means equipment that converts energy from the wind into electricity. This term includes the rotor, blades and associated mechanical and electrical conversion components necessary to generate, store and/or transfer energy.

## **00.05 Standards.**

A small wind energy system shall be a permitted use in all zones subject to the following requirements:

(1) **Setbacks.** A wind tower for a small wind energy system shall be set back a distance equal to the town's building set back requirements. No portion of the wind generator shall extend beyond the setback line, nor into the following:

(a) any public road right of way, unless written permission is granted by the government entity with jurisdiction over the road right of way;

(b) any overhead utility lines, unless written permission is granted by the utility that owns and/or controls the lines.

(2) **Access.**

(a) All ground-mounted electrical and control equipment shall be labeled and secured to prevent unauthorized access.

(b) The tower shall be designed and installed so as not to provide step bolts, a ladder, or other publicly accessible means of climbing the tower, for a minimum height of eight feet above the ground.

(3) **Lighting.** A small wind energy system shall not be artificially lighted unless such lighting is required by the Federal Aviation Administration.

(4) **Appearance, Color, and Finish.** The wind generator and the tower shall remain painted or finished in the color or finish that was originally applied by the manufacturer, unless a different color of finish is approved in the zoning approval.

(5) **Signs.** There shall be no signs that are visible from any public road posted on a small wind generator system or any associated building, except for the manufacturer's or installer's identification, appropriate warning signs, or owner identification.

(6) **Utility notification and interconnection.** Small wind energy systems that connect to the electric utility shall comply with the New Jersey's Net Metering and Interconnection Standards for Class I Renewable Energy Systems at N.J.A.C. 14:4-9

(7) **Met towers.** A met tower shall be permitted under the same standards, permit requirements, restoration requirements and permit procedures as a small wind energy system.

## **00.06 Permit Requirements.**

(1) **Permit.** A zoning permit shall be required for the installation of a small wind energy system.

(2) **Documents:** The zoning permit application shall be accompanied by a plot plan which includes the following:

(a) Property lines and physical dimensions of the property;

(b) Location, dimensions, and types of existing major structures on the property;

(c) Location of the proposed small wind energy system tower;

(d) The right-of-way of any public road that is contiguous with the property;

(e) Any overhead utility lines;

(f) Small wind energy system specifications, including manufacturer and model, rotor diameter, tower height, tower type (freestanding or guyed);

(3) Fees. The application for a zoning permit for a small wind energy system must be accompanied by the fee required.

(4) Expiration. A permit issued pursuant to this ordinance shall expire if:

(a) The small wind energy system is not installed and functioning within 24-months from the date the permit is issued; or

(b) The small wind energy system is out of service or otherwise unused for a continuous 18-month period.

#### **00.07 Abandonment.**

(1) A small wind energy system that is out-of-service for a continuous 18 -month period will be deemed to have been abandoned.

(2) The Administrator may issue a Notice of Abandonment to the owner of a small wind energy system that is deemed to have been abandoned. The notice shall be sent return receipt requested.

(3) The Owner shall have the right to respond to the Notice of Abandonment within 30 days from Notice receipt date.

(4) If the owner provides information that demonstrates the small wind energy system has not been abandoned, the Administrator shall withdraw the Notice of Abandonment and notify the owner that the Notice has been withdrawn.

(5) If the Administrator determines that the small wind energy system has been abandoned, the Owner of the small wind energy system shall remove the wind generator from the tower at the Owner's sole expense within 6 months after the Owner receives the Notice of Abandonment.

(6) If the owner fails to remove the wind generator from the tower in the time allowed under (5) above, the Administrator may pursue legal action to have the wind generator removed at the Owner's expense.

#### **00.08 Zoning Permit Procedure.**

(1) An Owner shall submit an application to the Administrator for a zoning permit for a small wind energy system.

(2) The Administrator shall issue a permit or deny the application within one month as consistent with Municipal Land Use Law of the date on which the application is received.

(3) If the application is approved, the Administrator will return one signed copy of the application with the zoning permit and retain the other copy with the application.

(4) If the application is rejected, the Administrator will notify the applicant in writing and provide a written statement of the reason why the application was rejected. The applicant may appeal the Administrator's decision pursuant to the appropriate appeals authority. The applicant may reapply if the deficiencies specified by the Administrator are resolved.

#### **00.09 Violations.**

(1) It is unlawful for any person to construct, install, or operate a small wind energy system that is not in compliance with this ordinance.

(2) Small wind energy systems installed prior to the adoption of this ordinance are exempt from the requirements of this ordinance, except for the provisions at 00.07 regarding abandonment.

**00.10 Administration and Enforcement.**

(1) This ordinance shall be administered by the Administrator or other official as designated.

(2) The Administrator may enter any property for which a permit has been issued under this ordinance to conduct an inspection to determine whether the conditions stated in the permit have been met.

(3) The Administrator may issue orders to abate any violation of this ordinance.

(4) The Administrator may issue a citation for any violation of this ordinance.

(5) The Administrator may refer any violation of this ordinance to legal counsel for enforcement.

**00.11 Penalties.**

(1) Any person who fails to comply with any provision of this ordinance shall be subject to enforcement and penalties as stipulated in chapter and section of the appropriate zoning code.

(2) Nothing in this section shall be construed to prevent the (County or Town) Board from using any other lawful means to enforce this ordinance.

**00.12 Severability.**

The provisions of this ordinance are severable, and the invalidity of any section, subdivision, paragraph, or other part of this ordinance shall not affect the validity or effectiveness of the remainder of the ordinance.

# APPENDIX

## 6

### DIRECT INSTALL BROCHURE



# Unlock Direct Installation Energy Savings for Your Facility

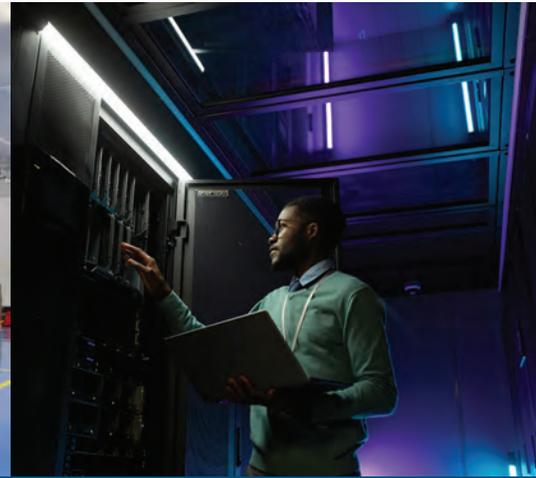
The **PSE&G Direct Install Program** is designed to deliver comprehensive, cost-effective, energy efficiency equipment for eligible PSE&G business customers, with 12-month individual facility electricity average peak demand usage of less than 200 kW. PSE&G can help businesses identify energy saving opportunities as part of the PSE&G Business Energy Saver Program.

Financial incentives are available to reduce the upfront cost of installing energy-saving equipment. In addition, customers can opt for repayment of the project costs with no interest, spread over a five-year period, with payment billed on your monthly PSE&G bill.

PSE&G's Direct Install Program can help uncover hidden facility energy savings that can cut energy costs by as much as 30%. When the work is complete, customers repay as little as 20% of the total project cost—interest-free—over 60 months on their PSE&G bill (or in one lump-sum payment, if preferred).



The PSE&G Business Energy Saver Program incentives help to ensure low equipment installation costs, short payback periods, and reduced energy use, leaving more money in your pocket. Savings realized through energy efficiency improvements can provide businesses with greater opportunity to invest in their business, developing or enhancing products and services that can be revenue generators.



The US Department of Energy estimates that lighting accounts for 40% of energy consumption in commercial facilities. Of that total, **30% is used in unoccupied areas.**

### How the program works:

- + The Direct Install Program team will verify customer eligibility.
- + A PSE&G authorized contractor will perform an energy assessment at no-cost for participating customer facilities.
- + The contractor will generate a proposal outlining costs, project details and participation agreements, and obtain all approvals and signatures.
- + The customer reviews the proposal and signs off on the proposed work.
- + The PSE&G authorized contractor submits final paperwork for processing and project initiation.
- + PSE&G performs a post-installation inspection.
- + PSE&G provides final approval process and final payment notification.

### The Direct Install Program benefits customers by:

- + Paying for 100% of up-front costs.
- + Providing a free on-site energy audit and detailed project cost estimate.
- + Recommending energy efficiency upgrades.
- + Executing all work through PSE&G authorized contractors.
- + Lowering energy costs by installing energy-efficient equipment.
- + Helping to increase facility operational efficiencies.
- + Creating the foundation for business facility operational efficiency.
- + Creating a safer and more comfortable workplace for employees.
- + Helping meet customer environmental goals by reducing the use of outdated and inefficient equipment and supporting lower carbon footprint standards.



For additional information scan this QR code or visit [bizsave.PSEG.com](https://bizsave.PSEG.com)

# APPENDIX

## 7

# BUSINESS ENERGY SAVER PROGRAM GUIDE



# PSEG



## **Business Energy Saver Program**

## **Prescriptive and Custom Incentive Guide**

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### General Eligibility Requirements

- The table below contains eligibility requirements and expected incentive values. Actual incentives may vary based on other program requirements and guidelines.
- Eligible products must be installed and used in accordance with their rated condition.
- All installations must be installed in accordance with all applicable local, state and national codes and ordinances.
- Program approval is required prior to purchase and installation for custom measures.



- All new lighting fixtures, retrofit kits and components must carry the appropriate designated Underwriters Laboratory (UL) or Electrical Testing Laboratory (ETL) label.
- All installations shall be designed and installed in accordance with best practices such as the Illuminating Engineering Society of North America (IESNA) Lighting Handbook.
- DesignLights Consortium® categories are listed under the Eligibility Criteria. Installed fixtures must be listed under that category to qualify for incentives.
- If the proposed equipment does not meet the eligibility requirements or is not listed below, the applicant may still may be eligible for a Custom Incentive. Contact a PSE&G representative for more details.

## LIGHTING

Interior Fixtures & Retrofit Kits	Classification	Incentive	Unit	Eligibility Criteria
1 x 4 LED integrated retrofit kit		\$50	per fixture	Eligible fixtures must be listed on DesignLights Consortium® with DLC Primary Use Designation as shown and DLC Category: Indoor Luminaires
1 x 4 LED new luminaire rated		\$50	per fixture	
2 x 2 LED integrated retrofit kit		\$30	per fixture	
2 x 2 LED new luminaire		\$40	per fixture	
2 x 4 LED integrated retrofit kit		\$50	per fixture	
2 x 4 LED new luminaire		\$50	per fixture	
LED direct linear ambient retrofit kit	2 ft.	\$15	per fixture	
	4 ft.	\$15	per fixture	
	8 ft.	\$25	per fixture	
LED direct/indirect linear ambient new luminaire	2 ft.	\$30	per fixture	
	3 ft.	\$30	per fixture	
	4 ft.	\$60	per fixture	
	6 ft.	\$75	per fixture	
	8 ft.	\$100	per fixture	
LED Track or Mono-point Directional Lighting Fixtures		\$30	per fixture	Eligible fixtures must be listed on DesignLights Consortium® with DLC Primary Use Designation as shown and DLC Category: Indoor Luminaires
LED Wall-Wash Luminaires		\$30	per fixture	
High Bay LED	5000 - 9,999 Lumens	\$100	per fixture	
	10,000 to 19,999 Lumens	\$150	per fixture	
	20,000 to 29,999 Lumens	\$200	per fixture	
	30,000 to 39,999 Lumens	\$300	per fixture	



**LIGHTING**

Interior Fixtures & Retrofit Kits	Classification	Incentive	Unit	Eligibility Criteria
High Bay LED	≥40,000 Lumens	\$400	per fixture	Eligible fixtures must be listed on DesignLights Consortium® with DLC Primary Use Designation as shown and DLC Category: Indoor Luminaires
Low Bay LED	5,000 to 9,999 Lumens	\$100	per fixture	
	10,000 to 19,999 Lumens	\$150	per fixture	
	20,000 to 29,999 Lumens	\$200	per fixture	
	30,000 to 39,999 Lumens	\$300	per fixture	
	≥40,000 Lumens	\$400	per fixture	
LED Stairwell and Passageway Luminaires	All Lumens	\$50	per fixture	
Exterior LED Fixtures	Classification	Incentive	Unit	Eligibility Criteria
LED Architectural Flood and Spot Luminaires	up to 4,999 Lumens	\$50	per fixture	DLC Primary Use Designation as shown and DLC Category: Outdoor Luminaires
	5,000 - 9,999 Lumens	\$150		
	10,000 to 19,999 Lumens	\$250		
	20,000 to 29,999 Lumens	\$300		
	30,000 to 39,999 Lumens	\$400		
	above 40,000 Lumens	\$525		
LED Landscape/Accent Flood and Spot Luminaires LED Parking Garage Luminaires	up to 4,999 Lumens	\$50	per fixture	DLC Primary Use Designation as shown and DLC Category: Outdoor Luminaires
	5,000 - 9,999 Lumens	\$150		
	10,000 to 19,999 Lumens	\$300		
	20,000 to 29,999 Lumens	\$350		
	30,000 to 39,999 Lumens	\$450		
	above 40,000 Lumens	\$400		
LED Bollard Fixtures	up to 4,999 Lumens	\$50	per fixture	DLC Primary Use Designation as shown and DLC Category: Outdoor Luminaires
	5,000 - 9,999 Lumens	\$150		
	10,000 to 19,999 Lumens	\$175		
	20,000 to 29,999 Lumens	\$225		



**LIGHTING**

Exterior LED Fixtures	Classification	Incentive	Unit	Eligibility Criteria
LED Bollard Fixtures	30,000 to 39,999 Lumens	\$275	per fixture	DLC Primary Use Designation as shown and DLC Category: Outdoor Luminaires
	above 40,000 Lumens	\$350		
LED Fuel Pump Canopy LED Outdoor Pole/Arm- Mounted Area and Roadway Luminaires LED Outdoor Wall-Mounted Area Luminaires	up to 4,999 Lumens	\$50	per fixture	DLC Primary Use Designation as shown and DLC Category: Outdoor Luminaires
	5,000 - 9,999 Lumens	\$150		
	10,000 to 19,999 Lumens	\$300		
	20,000 to 29,999 Lumens	\$300		
	30,000 to 39,999 Lumens	\$450		
	above 40,000 Lumens	\$400		
Other LED Fixtures	Classification	Incentive	Unit	Eligibility Criteria
Accent Light Line Voltage Bath Vanity Cove Mount	up to 1,499 Lumens	\$15	per fixture	ENERGY STAR Certified Light Fixtures
	1,500 - 2,999 Lumens	\$30		
	≥3,000 Lumens	\$45		
Ceiling Mount Pendant (Downlight, Decorative, etc.) Recessed Downlight Wall Sconces	up to 1,499 Lumens	\$10	per fixture	ENERGY STAR Certified Light Fixtures
	1,500 - 2,999 Lumens	\$15		
	≥3,000 Lumens	\$20		
Linear Strip Solid State Retrofit	up to 1,499 Lumens	\$5	per fixture	ENERGY STAR Certified Light Fixtures
	1,500 - 2,999 Lumens	\$10		
	≥3,000 Lumens	\$15		
Outdoor (Various Types) Outdoor Pole-Mount	up to 1,499 Lumens	\$30	per fixture	ENERGY STAR Certified Light Fixtures
	1,500 - 2,999 Lumens	\$30		
	≥3,000 Lumens	\$40		
Wrapped Lens	up to 1,499 Lumens	\$5	per fixture	ENERGY STAR Certified Light Fixtures
	1,500 - 2,999 Lumens	\$20		
	≥3,000 Lumens	\$30		

**LIGHTING**

Security	up to 1,499 Lumens	\$20	per fixture	ENERGY STAR Certified Light Fixtures
	1,500 - 2,999 Lumens	\$30		
	≥3,000 Lumens	\$40		
Under Cabinet	up to 1,499 Lumens	\$11	per fixture	ENERGY STAR Certified Light Fixtures
	1,500 - 2,999 Lumens	\$16.50		
	≥3,000 Lumens	\$22		
<b>LED Lamps</b>	<b>Classification</b>	<b>Incentive</b>	<b>Unit</b>	<b>Eligibility Criteria</b>
LED Linear Replacement Lamps	2 ft.	\$4	per lamp	DLC General Application as shown and DLC Category: Linear Replacement Lamps
	3 ft.	\$6		
	4 ft.	\$6		
	8 ft.	\$6		
High Output LED Linear Replacement Lamp	4 ft.	\$6		
LED U-Bend Lamp		\$5		
LED 2G11 Base Lamps		\$8.50	per lamp	DLC General Application as shown and DLC Category: Four Pin-Base Replacement Lamps for CFLs
LED Horizontally-Mounted Lamps		\$8.50		
LED Vertically-Mounted Lamps		\$8.50		
<b>LED HID Replacement Lamps</b>	<b>Classification</b>	<b>Incentive</b>	<b>Unit</b>	<b>Eligibility Criteria</b>
LED Replacement for HID Lamps	≤125W	\$50	per lamp	DLC Category: Mogul (E39) Screw-base Replacements for HID Lamps
	>125W - ≤250W	\$75		
	>250W	\$100		
<b>LED Bulbs</b>	<b>Classification</b>	<b>Incentive</b>	<b>Unit</b>	<b>Eligibility Criteria</b>
A Lamp		\$10	per bulb	ENERGY STAR Certified Light Bulbs
BR30		\$3		
BR40		\$3		
G16.5		\$3		
G25		\$3		
G30		\$3		
G40		\$3		



## LIGHTING

LED Bulbs	Classification	Incentive	Unit	Eligibility Criteria
PAR16		\$5	per bulb	ENERGY STAR Certified Light Bulbs
PAR20		\$5		
PAR30		\$8		
R14		\$5		
R16		\$5		
R20		\$8		
Other		\$2.50		
LED Exit Sign	Classification	Incentive	Unit	Eligibility Criteria
LED Exit Sign		\$15	per sign	
LED Refrigerated Case Lighting	Classification	Incentive	Unit	Eligibility Criteria
Refrigerated Case Lighting	4 ft.	\$50	per fixture	DLC Primary Use Designation as shown and DLC Category: Indoor Luminaires
	5 ft.	\$50		
	6 ft.	\$50		

## LIGHTING CONTROLS

Standalone Lighting Controls	Classification	Incentive	Unit	Eligibility Standard
Dual daylight & occupancy sensor (DOS)-integrated into fixture	20w to 149w controlled	\$30	per fixture	UL or other OSHA-approved Nationally Recognized Testing Laboratory in accordance with applicable US standards
Dual daylight & occupancy sensor (DOS)-integrated into fixture	≥150w controlled	\$50	per fixture	
Daylight continuous dimming control - integrated into fixture	20w to 149w controlled	\$20	per fixture	
Daylight continuous dimming control - integrated into fixture	≥150w controlled	\$40	per fixture	
Interior Occupancy/Vacancy Sensor - Remote Mounted		\$25	per control	
Interior Occupancy/Vacancy Sensor - Wall Mounted		\$25	per control	
Interior Occupancy/Vacancy Sensor - Integrated		\$30	per control	
Interior Occupancy Dimming Control - Integrated		\$15	per control	
Interior Occupancy Sensor for Highbay - Remote Mounted		\$25	per control	



**LIGHTING**

Network Lighting Controls	Classification	Incentive	Unit	Eligibility Standard
Networked lighting control system controlling efficient luminaires		\$0.60	per Watt controlled	DLC listed. UL or other OSHA-approved Nationally Recognized Testing Laboratory in accordance with applicable US standards
Luminaire level lighting control - with local or cloud server	20W - 149W Controlled	\$30	per fixture	
Luminaire level lighting control - with local or cloud server	≥150W Controlled	\$60	per fixture	

- Efficiency requirements to comply with ASHRAE.
- An AHRI Certificate is required for new electric HVAC units. AHRI Certificates can be downloaded from <http://www.ahridirectory.org>.
- Manufacturers Specification Sheet Required

### HVAC

Packaged Terminal Units	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
PTHP	≥5,000, < 7,000 Btu	12.875 EER 3.48964 COP	\$100	per ton	ASHRAE 90.1 2016; Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers
	≥7,000, < 8,000 Btu	12.1025 EER 3.4093 COP	\$100	per ton	
	≥8,000, < 9,000 Btu	11.7935 EER 3.35574 COP	\$100	per ton	
	≥9,000, < 10,000 Btu	11.4845 EER 3.30218 COP	\$100	per ton	
	≥10,000, < 11,000 Btu	11.1755 EER 3.24862 COP	\$100	per ton	
	≥11,000, < 12,000 Btu	10.8665 EER 3.19506 COP	\$100	per ton	
	≥12,000, < 13,000 Btu	10.5575 EER 3.1415 COP	\$100	per ton	
	≥13,000, < 14,000 Btu	10.2485 EER 3.08794 COP	\$100	per ton	
	≥14,000, < 15,000 Btu	9.9395 EER 3.03438 COP	\$100	per ton	
	≥15,000 Btu	9.785 EER 3.0076 COP	\$100	per ton	
PTAC	≥5,000, < 7,000 Btu	12.875 EER	\$100	per ton	ASHRAE 90.1 2016; Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers
	≥7,000, < 8,000 Btu	12.1025 EER	\$100	per ton	
	≥8,000, < 9,000 Btu	11.7935 EER	\$100	per ton	
	≥9,000, < 10,000 Btu	11.4845 EER	\$100	per ton	



### HVAC

Packaged Terminal Units	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
PTAC	≥10,000, < 11,000 Btu	11.1755 EER	\$100	per ton	ASHRAE 90.1 2016; Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers
	≥11,000, < 12,000 Btu	10.8665 EER	\$100	per ton	
	≥12,000, < 13,000 Btu	10.5575 EER	\$100	per ton	
	≥13,000, < 14,000 Btu	10.2485 EER	\$100	per ton	
	≥14,000, < 15,000 Btu	9.9395 EER	\$100	per ton	
	≥15,000 Btu	9.785 EER	\$100	per ton	
Single Package Vertical Systems	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
Single Package Vertical Heat Pumps - Tier 1	≤ 5.4 tons	10.2 EER 3.1 COP	\$80	per ton	ASHRAE 90.1 2016; Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers
Single Package Vertical Heat Pumps - Tier 2	≤ 5.4 tons	10.7 EER 3.2 COP	\$160	per ton	
Single Package Vertical Heat Pumps - Tier 1	> 5.4 and ≤ 11.25 tons	10.2 EER 3.1 COP	\$80	per ton	
Single Package Vertical Heat Pumps - Tier 2	> 5.4 and ≤ 11.25 tons	10.7 EER 3.2 COP	\$160	per ton	
Single Package Vertical Heat Pumps - Tier 1	> 11.25 and ≤ 20 tons	10.2 EER 3.1 COP	\$80	per ton	
Single Package Vertical Heat Pumps - Tier 2	> 11.25 and ≤ 20 tons	10.7 EER 3.2 COP	\$160	per ton	
Single Package Vertical AC - Tier 1	≤ 5.4 tons	10.2 EER	\$75	per ton	ASHRAE 90.1 2016; Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers
Single Package Vertical AC - Tier 2	≤ 5.4 tons	10.7 EER	\$100	per ton	
Single Package Vertical AC - Tier 1	> 5.4 and ≤ 11.25 tons	10.2 EER	\$45	per ton	
Single Package Vertical AC - Tier 2	> 5.4 and ≤ 11.25 tons	10.7 EER	\$90	per ton	
Single Package Vertical AC - Tier 1	> 11.25 and ≤ 20 tons	10.2 EER	\$45	per ton	
Single Package Vertical AC - Tier 2	> 11.25 and ≤ 20 tons	10.7 EER	\$90	per ton	



### HVAC

Air Source Heat Pumps	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
Single Package - Tier 1	≤ 5.4 tons	14.3 SEER 8.2 HSPF	\$75	per ton	ASHRAE 90.1 2016; Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers
Single Package - Tier 2	≤ 5.4 tons	15.5 SEER 8.5 HSPF	\$100	per ton	
Split System - Tier 1	≤ 5.4 tons	14.3 SEER 8.4 HSPF	\$75	per ton	
Split System - Tier 2	≤ 5.4 tons	15.5 SEER 8.5 HSPF	\$100	per ton	
Split and Single Package - Tier 1	> 5.4 and ≤ 11.25 tons	11.5 SEER 12.2 IEER 3.4 COP	\$80	per ton	
Split and Single Package - Tier 2	> 5.4 and ≤ 11.25 tons	12.1 SEER 12.8 IEER 3.5 COP	\$100	per ton	
Split and Single Package - Tier 1	> 11.25 and ≤ 20 tons	11.5 SEER 11.6 IEER 3.3 COP	\$80	per ton	
Split and Single Package - Tier 2	> 11.25 and ≤ 20 tons	11.7 SEER 15.0 IEER 3.3 COP	\$100	per ton	
Split and Single Package - Tier 1	> 20 tons	9.5 SEER 10.6 IEER 3.2 COP	\$80	per ton	
Split and Single Package - Tier 2	> 20 tons	9.7 SEER 12.0 IEER 3.2 COP	\$100	per ton	
Ductless, Mini Split Air Conditioners or Heat Pumps	All Sizes	15.5 SEER 8.5 HSPF	\$125	per ton	
Ductless, Mini Split Air Conditioners	All Sizes	15.5 SEER	\$125	per ton	
Ground And Water Heat Pumps	Classification	Qualifying Efficiency	Incentive	Unit	
Water Source Heat Pump - Tier 1	≤ 1.4 tons	12.4 EER 4.0 COP	\$50	per ton	ASHRAE 90.1 2016; Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers
Water Source Heat Pump - Tier 2	≤ 1.4 tons	14.0 EER 4.8 COP	\$100	per ton	
Water Source Heat Pump - Tier 1	> 1.4 and ≤ 5.4 tons	13.3 EER 4.3 COP	\$50	per ton	
Water Source Heat Pump - Tier 2	> 1.4 and ≤ 5.4 tons	15.0 EER 4.5 COP	\$100	per ton	
Water Source Heat Pump - Tier 1	> 5.4 and ≤ 11.25 tons	13.3 EER 4.3 COP	\$50	per ton	



### HVAC

Ground And Water Heat Pumps	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
Water Source Heat Pump - Tier 2	> 5.4 and ≤11.25 tons	15.0 SEER 4.5 COP	\$100	per ton	ASHRAE 90.1 2016; Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers
Ground Water Source Heat Pump - Tier 1	≤ 11.25 tons	18.4 EER 3.7 COP	\$100	per ton	
Ground Water Source Heat Pump - Tier 2	≤ 11.25 tons	22.0 EER 3.9 COP	\$500	per ton	
Ground Source Heat Pump - Tier 1	≤ 11.25 tons	14.4 EER 3.2 COP	\$100	per ton	
Ground Source Heat Pump - Tier 2	≤ 11.25 tons	18.0 EER 3.6 COP	\$500	per ton	
Air Cooled - Unitary HVAC	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
Single Package - Tier 1	≤ 5.4 tons	14.3 SEER	\$75	per ton	ASHRAE 90.1 2016; Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers
Single Package - Tier 2	≤ 5.4 tons	16.0 SEER	\$100	per ton	
Split System - Tier 1	≤ 5.4 tons	14.0 SEER	\$75	per ton	
Split System - Tier 2	≤ 5.4 tons	16.0 SEER	\$100	per ton	
Split and Single Package - Tier 1	> 5.4 and ≤11.25 tons	11.5 EER 13.0 IEER	\$80	per ton	
Split and Single Package - Tier 2	> 5.4 and ≤11.25 tons	12.5 EER 14.0 IEER	\$100	per ton	
Split and Single Package - Tier 1	> 11.25 and ≤ 20 tons	11.5 EER 12.4 IEER	\$80	per ton	
Split and Single Package - Tier 2	> 11.25 and ≤ 20 tons	12.0 EER 14.0 IEER	\$100	per ton	
Split and Single Package - Tier 1	> 20 and ≤ 63.33 tons	10.5 EER 11.6 IEER	\$80	per ton	
Split and Single Package - Tier 2	> 20 and ≤ 63.33 tons	11.0 EER 12.5 IEER	\$100	per ton	
Central DX Air Conditioner - Tier 1	> 63 tons	9.7 EER 11.2 IEER	\$80	per ton	
Central DX Air Conditioner - Tier 2	> 63 tons	10.0 EER 12.0 IEER	\$80	per ton	



## VARIABLE FREQUENCY DRIVERS

Variable Frequency Drives (VFD) Measures	Classification	Incentive	Unit	Eligibility Standard
Supply Air Fan VFD Return Air Fan VFD Chilled Water or Condenser Water Pump VFD Heating Hot Water Pump VFD Water Source Heat Pump VFD Cooling Tower Fan VFD Boiler Feedwater Pump VFD	≤ 2 HP	\$500	per drive	Horsepower (HP) refers to nameplate HP of the motor controlled by the drive. Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory.
	3 HP	\$600	per drive	
	4 HP	\$700	per drive	
	5 HP	\$800	per drive	
	7.5 HP	\$1,150	per drive	
	10 HP	\$1,400	per drive	
	15 HP	\$1,750	per drive	
	20 HP	\$2,000	per drive	
	25 HP	\$2,500	per drive	
	30 HP	\$3,000	per drive	
	40 HP	\$3,500	per drive	
	50 HP	\$4,000	per drive	
	60 HP	\$4,500	per drive	
	75 HP	\$5,000	per drive	
	100 HP	\$6,000	per drive	
101 HP to 200 HP	\$50	per HP		
Ventilation Measures	Classification	Incentive	Unit	Eligibility Criteria
90% TE Make-up Air Unit - Gas Only		\$8	per kbtu/hr	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
High Speed Fan	24" - 35"	\$50	per unit	
	36" - 47"	\$75	per unit	
	48" - 61"	\$100	per unit	
EC Motors - HVAC Blower Fan		\$150	per motor	
High Volume Low Speed Fan (HVLS)	16'	\$400	per unit	
	18'	\$450	per unit	

Ventilation Measures	Classification	Incentive	Unit	Eligibility Criteria
High Volume Low Speed Fan (HVLS)	20'	\$500	per unit	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
	22'	\$550	per unit	
	24'	\$600	per unit	
HVAC - Other	Classification	Incentive	Unit	Eligibility Criteria
Dual Enthalpy Economizer	≤ 5 tons	\$250	per control	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
	> 5 tons	\$250	per control	
Motel Room Guest Occupancy Sensor - Electric Only		\$75	per unit	
Hotel Guest Room Occupancy Sensor - Electric Only		\$75	per unit	
Smart Thermostat Electric AC & Heat		\$100	per unit	
Smart Thermostat Electric AC & Gas Heat		\$100	per unit	
EC Motors - Hydronic Pump	< 1HP	\$150	per unit	Horsepower (HP) refers to nameplate HP of the motor controlled by the drive. Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory.
	1 HP	\$150	per unit	
	2 HP	\$175	per unit	
	3 - 5 HP	\$250	per unit	
	6 - 10 HP	\$500	per unit	
	11+ HP	\$750	per unit	

- Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers.

### HEATING

Gas Furnace & Unit Heater	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
Gas Furnace	< 225 kBtu	95% AFUE	\$800	per unit	ENERGY STAR
	< 225 kBtu	97% AFUE	\$1,000	per unit	
	≥ 225 kBtu	95% AFUE	\$800	per unit	
	≥ 225 kBtu	97% AFUE	\$1,000	per unit	
Condensing Unit Heater	All Sizes	90% AFUE	\$750	per unit	
Gas Heater	Classification	Incentive	Unit	Eligibility Criteria	
Gas Infrared Heater	≤ 100 Mbtu/h	\$750	per unit	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)	
	> 100 Mbtu/h	\$500	per unit		
Tune Ups - Gas Only	Classification	Incentive	Unit	Eligibility Criteria	
Boiler Tune-up	All Sizes	\$1	per kBtu	Before / After Combustion Analysis Results Required	
Furnace Tune Up	All Sizes	\$150	per Furnace		
Economizer	Classification	Incentive	Unit	Eligibility Criteria	
Fuel Use Economizer		\$1,200	per unit		



# PSE&G

## Water Heating & Boilers

- Equipment must meet or exceed the qualifying efficiency listed for the applicable classification tiers

### WATER HEATING & BOILERS

Gas Condensing Boilers	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
Hot water, condensing boiler - Tier 1	< 300 MBH	90% AFUE	\$750	per Boiler	CEE Tier 1
	≥ 300 to ≤ 2500 MBH	88% TE	\$3	per MBH	
	> 2500 to ≤ 4000 MBH	81% TE	\$3	per MBH	
Hot water, condensing boiler - Tier 2	< 300 MBH	95% AFUE	\$850	per Boiler	ENERGY STAR
	≥ 300 to ≤ 2500 MBH	94% TE	\$3.50	per MBH	
	> 2500 to ≤ 4000 MBH	88% TE	\$3.50	per MBH	
Gas Non-Condensing Boilers	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Criteria
Hot water, non-condensing boiler	< 300 MBH	85% AFUE	\$1.50	per MBH	
	≥ 300 to ≤ 1500 MBH	85% TE	\$1.75	per MBH	
	> 1500 to ≤ 2500 MBH	85% TE	\$1.50	per MBH	
	> 2500 to ≤ 4000 MBH	85% CE	\$1.50	per MBH	
Steam, all except natural draft, non-condensing boiler	< 300 MBH	82% AFUE	\$2	per MBH	
	≥ 300 to ≤ 2500 MBH	81% TE	\$2	per MBH	
	> 2500 to ≤ 4000 MBH	81% CE	\$2	per MBH	
Steam, natural draft, non-condensing boiler	< 300 MBH	82% AFUE	\$2	per MBH	
	≥ 300 to ≤ 2500 MBH	82% TE	\$1	per MBH	
	2500 to ≤ 4000 MBH	82% CE	\$1	per MBH	
Gas Water Heaters	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
DHW, Instant, Gas-Fired	≤ 200,000 Btuh	> 90% TE	\$750	per unit	ENERGY STAR
	> 200,000 Btuh	> 90% TE	\$1,000	per unit	



# PSE&G

## Water Heating & Boilers

Gas Water Heaters	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Standard
DHW Storage, Gas-Fired	< 75,000 Btuh	> 0.67 EF or 0.64 UEF	\$350	per unit	ENERGY STAR
	< 75,000 Btuh	> 0.81 UEF	\$500	per unit	
	> 75,000 to < 105,000 Btuh	> 82% TE	\$500	per unit	
	> 75,000 to < 105,000 Btuh	> 94% TE	\$750	per unit	
	> 105,000 Btuh	> 82% TE	\$500	per unit	
	> 105,000 Btuh	> 94% TE	\$750	per unit	
Condensing Integrated Boiler and Water Heater	≤ 300 MBH	92% AFUE	\$1,300	per unit	
	> 300 MBH	94% TE	\$1,500	per unit	
Electric Water Heaters	Classification	Qualifying Efficiency	Incentive	Unit	Eligibility Criteria
Heat Pump Electric Storage Water Heater	size > 55 gallons		\$1,000	per unit	Equipment must be qualified by the current version of ENERGY STAR
	size ≤ 55 gallons		\$750	per unit	
Water Heating - Other	Classification	Incentive	Unit	Eligibility Standard	
Boiler Outside Air Reset Control	Gas	\$1	per kBtu		
Hot Water Recirculating system with demand control/temperature modulation - Dormitory	Gas	\$20	per Dwelling Unit		
Hot Water Recirculating system with demand control/temperature modulation - Multi Family	Gas	\$40	per Dwelling Unit		

### REFRIGERATION

Refrigeration Motors, Controls, & Compressors	Classification	Incentive	Unit	Eligibility Criteria
Anti-Sweat Heater Control / Door Heater Control	Cooler/Medium Temp Door	\$50	per Door	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
	Freezer/Low Temp Door	\$50	per Door	
Floating Head Pressure Controls		\$75	per Ton	
EC Motors for Evaporator Fans	replacing shaded pole motor	\$75	per Motor	
	replacing PSC	\$75	per Motor	
Variable Speed Refrigeration Compressor		\$1,000	per Compressor	ASHRAE 90.1 2013; Equipment must exceed the standard
Refrigeration Gaskets, Doors & Strips	Classification	Incentive	Unit	Eligibility Criteria
Automatic Door Closer	Cooler	\$50	per Door	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
	Freezer	\$75	per Door	
Door Gasket	Cooler Reach-in	\$4	per Linear ft	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
	Freezer Reach-in	\$4	per Linear ft	
	Cooler Walk-in	\$4	per Linear ft	
	Freezer Walk-in	\$4	per Linear ft	
Strip Curtains	Cooler, Convenience Store	\$5	per Sq. ft.	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
	Cooler, Restaurant	\$5	per Sq. ft.	
	Cooler, Supermarket	\$5	per Sq. ft.	
	Freezer, Convenience Store	\$5	per Sq. ft.	
	Freezer, Restaurant	\$5	per Sq. ft.	
	Freezer, Supermarket	\$5	per Sq. ft.	
Night Cover	Low temp (-32°F to 0°F)*	\$20	per Linear ft.	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
	Medium Temp, case temperature (> 0°F to ≤ 32°F)*	\$15	per Linear ft.	

Refrigeration Gaskets, Doors & Strips	Classification	Incentive	Unit	Eligibility Criteria
Night Cover	High Temp case temperature (> 32F° to 55°F)*	\$10	per Linear ft.	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
Refrigeration Display Case Doors on Open Display Case*		\$75	per Linear ft.	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
Walk-in or Reach-in Cooler/Freezer Evaporator Fan Motor Control		\$75	per Motor	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)

\*Incentive is capped at \$500 per cover/case.

**FOOD SERVICE**

Ovens, Fryers, Steamers & Griddles	Classification	Incentive	Unit	Eligibility Criteria	
Combination Oven/Steamer	Gas	\$2,000	per Oven	Equipment must be qualified by the current version of ENERGY STAR or CEE	
	Electric	\$1,200			
Convection Oven	Gas	\$750	per Oven		
	Electric	\$350			
Standard Vat Fryer	Electric	\$200	per Fryer		
Steam Cooker	Gas	\$200	per Pan		
	Electric	\$150			
Griddle	Gas	\$500	per Griddle		
	Electric	\$300			
Rack Oven	Single - Gas	\$1,000	per Oven		
	Double - Gas	\$1,000			
Commercial Conveyor Oven	Gas	\$1,500	per Oven		
Commercial Fryer	Gas	\$750	per Fryer		
Dishwashers	Classification	Incentive	Unit		Eligibility Criteria
Commercial Dishwasher - Under Counter - Electric	Low Temperature	\$75	per Dishwasher		Equipment must be qualified by the current version of ENERGY STAR or CEE
	High Temperature	\$400			
Commercial Dishwasher - Under Counter - Gas	Low Temperature	\$50			
	High Temperature	\$400			
Commercial Dishwasher - Door Type - Electric	Low Temperature	\$800			
	High Temperature	\$600			
Commercial Dishwasher - Door Type - Gas	Low Temperature	\$400			
	High Temperature	\$700			
Commercial Dishwasher - Single Tank Conveyor - Electric	Low Temperature	\$400			
	High Temperature	\$1,000			
Commercial Dishwasher - Single Tank Conveyor - Gas	Low Temperature	\$200			
	High Temperature	\$1,000			
Commercial Dishwasher - Multiple Tank Conveyor - Electric	Low Temperature	\$1,000			
	High Temperature	\$1,500			

Dishwashers	Classification	Incentive	Unit	Eligibility Criteria
Commercial Dishwasher - Multiple Tank Conveyor - Gas	Low Temperature	\$200	per Dishwasher	Equipment must be qualified by the current version of ENERGY STAR or CEE
	High Temperature	\$1,500		
Refrigerators & Freezers	Classification	Incentive	Unit	Eligibility Criteria
Commercial Glass Door Refrigerator	≤ 15 ft3	\$75	per Refrigerator	Equipment must be qualified by the current version of ENERGY STAR or CEE
	> 15 to ≤ 30 ft3	\$100		
	> 30 to < 50 ft3	\$150		
	≥ 50 ft3	\$150		
Commercial Solid Door Refrigerator	≤ 15 ft3	\$100	per Refrigerator	Equipment must be qualified by the current version of ENERGY STAR or CEE
	> 15 to ≤ 30 ft3	\$100		
	> 30 to < 50 ft3	\$200		
	≥ 50 ft3	\$225		
Commercial Glass Door Freezer	≤ 15 ft3	\$200	per Freezer	Equipment must be qualified by the current version of ENERGY STAR or CEE
	> 15 to ≤ 30 ft3	\$250		
	> 30 to < 50 ft3	\$300		
	≥ 50 ft3	\$300		
Commercial Solid Door Freezer	≤ 15 ft3	\$100	per Freezer	Equipment must be qualified by the current version of ENERGY STAR or CEE
	> 15 to ≤ 30 ft3	\$200		
	> 30 to < 50 ft3	\$300	per Freezer	Equipment must be qualified by the current version of ENERGY STAR or CEE
	≥ 50 ft3	\$500		
Commercial Ice Machine Measures	Classification	Incentive	Unit	Eligibility Standard
Commercial Ice Machines - Tier 1	0-100 lbs/day	\$75	per Ice Machine	Tier 1: ENERGY STAR Certified Commercial Ice Machines
	101-200 lbs/day	\$75		
	201-300 lbs/day	\$150		
	301-400 lbs/day	\$100		
	401-500 lbs/day	\$100		
	501-1000 lbs/day	\$150		
	1001-1500 lbs/day	\$200		
	> 1500 lbs/day	\$200		

Commercial Ice Machine Measures	Classification	Incentive	Unit	Eligibility Standard
Commercial Ice Machines - Tier 2	0-100 lbs/day	\$100	per Ice Machine	Tier 2: CEE Commercial Kitchens Ice Machines
	101-200 lbs/day	\$100		
	201-300 lbs/day	\$200		
	301-400 lbs/day	\$150		
	401-500 lbs/day	\$150		
	501-1000 lbs/day	\$200		
	1001-1500 lbs/day	\$300		
Other Food Service	Classification	Incentive	Unit	Eligibility Criteria
Pre Rinse Spray Valve	Electric Water Heating	\$35	per Spray Valve	Maximum flow rate of 1.28 gpm
	Gas Water Heating	\$25	per Spray Valve	
Hot Food Holding Cabinet	1/2 Size	\$300	per Cabinet	Equipment must be qualified by the current version of ENERGY STAR or CEE
	3/4 Size	\$350		
	Full Size	\$400		

### AGRICULTURE

Agriculture	Classification	Incentive	Unit	Eligibility Criteria
Engine Block Heater Timer		\$25	per Heater	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
Auto Milker Takeoff		\$90	per unit	
Dairy Scroll Compressor		\$1,000	per unit	
Heat Reclaimers		\$1,000	per unit	
Livestock Waterer		\$60	per unit	
Dairy Vac Pump VSD Controls		\$1,000	per unit	
Low Pressure Irrigation	Agriculture	\$100	per Acre	
	Golf Course	\$100	per Acre	
Dairy Refrigeration Tune-Up		\$200	per unit	

### PLUG LOADS

Plug Loads	Classification	Incentive	Unit	Eligibility Standard
Advanced Power Strip	Tier 1	\$15	per strip	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
	Tier 2	\$25		
Monitors	C&I	\$10	per unit	ENERGY STAR
Computers	C&I	\$10	per unit	
Imaging	C&I	\$20	per unit	
Uninterruptible Power Supply (UPS)	C&I	\$40	per kVA	
Small Network PC Controller		\$15	per PC controlled	
Vending Machine & Control	Classification	Incentive	Unit	Eligibility Standard
Vending Machine Control	Non-Refrigerated	\$50	per Controller	Product must be UL Listed, or listed by equivalent OSHA Nationally Recognized Testing Laboratory (NRTL)
	Refrigerated	\$125	per Controller	
Glass Front Refrigerated Cooler Control		\$100	per Controller	
Beverage Vending Machine	Class A	\$75	per unit	Equipment must be qualified by the current version of ENERGY STAR or CEE

## RESIDENTIAL APPLIANCES

Residential Appliances in Commercial Settings	Classification	Incentive	Unit	Eligibility Criteria
Clothes Washer - Tier 1	Electric	\$100	per unit	ENERGY STAR
	Gas	\$150	per unit	
Clothes Washer - Tier 2	Electric	\$100	per unit	ENERGY STAR Most Efficient
	Gas	\$200	per unit	
Clothes Dryer - Tier 1 (with Moisture Sensor)	Electric	\$50	per unit	ENERGY STAR
	Gas	\$150	per unit	
Clothes Dryer - Tier 2	Electric	\$50	per unit	ENERGY STAR Most Efficient
	Gas	\$200	per unit	
Refrigerators	Tier 1 Electric	\$100	per unit	ENERGY STAR
	Tier 2 Electric	\$100	per unit	
Freezer	Electric	\$50	per unit	
Dehumidifier	Electric	\$25	per unit	
Room Air Conditioner	Electric	\$25	per unit	
Water Cooler	Electric	\$50	per unit	

## MISCELLANEOUS

Residential Appliances in Commercial Settings	Classification	Incentive	Unit	Eligibility Criteria
Indoor Pool Cover	Gas	\$1	per Sqft	
Outdoor Pool Cover	Gas	\$0.75	per Sqft	
Commercial Clothes Washer - Tier 1	Electric	\$100	per unit	ENERGY STAR
	Gas	\$100	per unit	
Commercial Clothes Washer - Tier 2	Electric	\$200	per unit	ENERGY STAR Most Efficient
	Gas	\$200	per unit	

- Projects are required to provide the total energy savings of the measure(s). Energy savings analysis must be supported by existing and proposed facility data, such as operating schedules, EMS/BMS data, etc.; standard assumptions and baseline must be set in cases where EMS/BMS data is unavailable.
- In absence of energy analysis or model, Pre and post installation M&V may be required. Adjusted savings calculations may be required depending on the results of the metering.
- The energy savings calculations must only include the energy savings related to the custom measure(s).
- **Certain measures may require pre and post install M&V for savings validation. In such cases, data points essential to analyzing the savings will be communicated and depending on the SOW, pre and post data measurement timeframe will be set; in case acceptable EMS/BMS data is unavailable, a separate M&V will be required for the set timeframe.**
- Proposed measures will not be eligible for Custom Measure incentives if a Prescriptive incentive is available. Proposed measures must meet or exceed mandated/industry standards & codes where applicable. Applicability of codes & standards will be determined by PSE&G's engineering staff during the application review process.
- **State energy code is ASHRAE 90.1-2016. In cases where ASHRAE 90.1-2016 does not apply, other applicable industry standards will be used, such as the Consortium for Energy Efficiency (CEE), EPA ENERGY STAR, Design Lights Consortium, NEMA, Federal Title 10 or other established resources such as: current New Jersey baseline studies and other market research; experience of the New Jersey utilities; or utility/public program experience from other comparable jurisdictions.**
- Final rebate/incentive payment is based upon installed equipment specifications, operating data, and final energy savings, and may be lower than preapproved amount.
- Program approval is required prior to purchase and installation for custom measures.
- Custom project incentives are **capped at 50% of total project cost.**
- Customer/Contractor must complete and submit Data Collection Forms (DCF) for measures as communicated by PSE&G engineering team. Note that DCFs are available for most measures mentioned in the below table. Anywhere a DCF is not available or developed, customer/contractor must submit supporting information detailing the measure parameters required for energy savings analysis.

## CUSTOM

Common Custom Measures	Classification	Incentive	Unit	Eligibility Criteria
HVAC/Chillers HVAC/VRF HVAC Controls & Chiller Plant Optimization Compressed Air Systems Refrigeration	Electric Savings	\$0.16	per kWh	Measures/equipment must not be prescriptive measures and meet mandated/industry standards & codes where applicable. Analysis and documents supporting the energy savings must be submitted with the application, including measure Data Collection Forms (DCF) as applicable.
Data Center Equipment/Servers Motors/VFD - Large Building Improvements Process Improvements Agricultural Lighting/Process Custom Lighting Other Non Prescriptive	Gas Savings	\$3.50	per Therm	



# APPENDIX

## 8

# SAMPLE GREEN DEVELOPMENT CHECKLIST

## **Green Design – Commercial & Residential Buildings Resolution**

This Green Building Policy/Resolution action is a pre-requisite and must be completed before points will be awarded for additional GREEN DESIGN actions.

### **RESOLUTION ENDORSING THE ADOPTION OF GREEN BUILDING PRACTICES FOR CIVIC, COMMERCIAL AND RESIDENTIAL BUILDINGS**

WHEREAS, buildings account for 39% of CO2 emissions – more than either the transportation or industrial sectors. In addition, buildings account for nearly 12% of potable water use, 65% of waste output, and 71% of electricity consumption in the U.S. (U.S. Green Building Council).

WHEREAS, green building – also referred to as sustainable or high-performance building -- is a collection of better design, construction, and operating practices that have the potential to reduce or eliminate the negative impacts of development on the environment and on human health. There are many examples of green building programs and guidelines that have been propagated at national, state, and municipal levels. They commonly address energy efficiency and carbon emissions reduction, water conservation, waste reduction, healthy and sustainably produced materials, indoor air quality, occupant productivity and health, and other components of green building and sustainable development.

WHEREAS, the purpose of this resolution is to enhance the public welfare and assure that commercial, residential and civic development is consistent with the (identify name of municipality) desire to create a more sustainable community by incorporating green building measures into the design, construction, operation and maintenance of buildings.

WHEREAS, the City additionally wishes to support green building in the private sector through a combination of voluntary actions (e.g., including a green building scorecard as a discussion item within the Site Plan approval process), actions that may be required in the future although not at the time of the adoption of this resolution (e.g., amending the Site Plan approval checklist to directly incorporate those green building standards available to a municipality), and educational actions (e.g., making available

information on green building programs, guidelines, rebates etc to residents of the municipality).

NOW, THEREFORE, BE IT RESOLVED that the (Name of Municipality) hereby implements a Green Building Policy that:

will encourage green design for commercial and residential buildings.

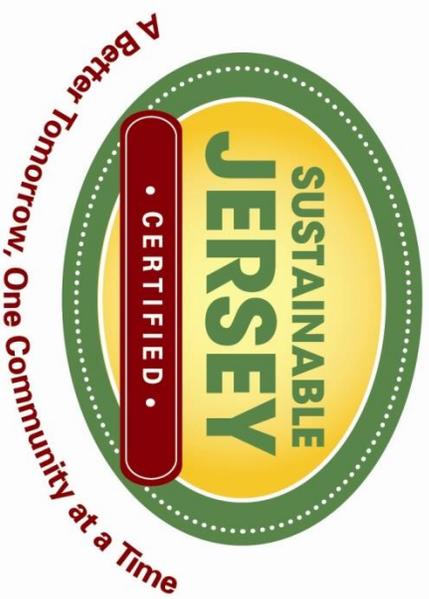
BE IT FURTHER RESOLVED,

CERTIFICATION

I, \_\_\_\_\_, Clerk of the (Name of Municipality), in the County of (Name of County), do hereby certify that the foregoing is a true and correct copy of a resolution duly adopted by the Township Council at a regular meeting held on the \_\_ day of \_\_\_\_ 2009.

IN WITNESS WHEREOF I have hereunto set my hand and affixed the seal of said Township this \_\_ day of \_\_\_\_ 2009.

\_\_\_\_\_



## Green Development Checklist

Revised August 2015

### MODEL GREEN DEVELOPMENT CHECKLIST

This Model Green Development Checklist has been prepared to assist communities in encouraging and reviewing planning submissions for sustainable green design aspects of development projects. Current planning criteria frequently do not address these issues; therefore, they may not be considered in the formal approval process. However, it is beneficial for reviewers of a proposed development to have a comprehensive understanding of the development's potential to incorporate green design, increasing the site's sustainability and its impact on the community. The checklist is organized by scale from regional context, to individual site, to the structures on the site:

1. First, it addresses the site within its regional and local context, looking at its physical location, development status, connectivity to infrastructure (transportation, community, green space) and beneficial and detrimental impacts within the regional or local context.
2. Second, it addresses the site itself, looking at the beneficial or detrimental impacts of the development on site.

3. Third, it addresses the structures on the site, again looking at beneficial or detrimental impacts. As mentioned earlier, many green design aspects overlap. The handling of rainwater impacts the regional water supply and treatment; the onsite supply's usage and treatment, and the water usage and treatment in the building. Each aspect must be considered at each scale.

Sustainable Jersey provides many tools to assist in the implementation of green design which should be reviewed to further the understanding and use of this review.

Also, some of the topics below are hyperlinked to other Sustainable Jersey actions, which can serve as resources for further information on those topics.

Items that are in **bold** are **required** in order to receive points toward Sustainable Jersey certification.

**1. Context**

Connectivity to existing neighborhoods may have many benefits to the health and safety of residents, the economy and diversity of the area, and the surrounding environment. To ensure a proposed development provides the optimum level of connectivity to existing neighborhoods, the following checklist questions are meant to:

1. Encourage development within and near existing communities and public transit infrastructure
2. Encourage improvement and redevelopment of existing cities, suburbs, and towns while limiting the expansion of the development footprint in the region to appropriate circumstances.
3. Reduce vehicle trips and vehicle distance travelled.
4. Reduce the incidence of obesity, heart disease, and hypertension by encouraging daily physical activity associated with walking and bicycling.

CONTEXT	YES	NO	DESCRIPTION
Is the site a redevelopment, brownfield or infill location?			
Is the site served by public transit, pedestrian and bicycle networks?			
Is there train service within ½ mile or bus service within ¼ mile?			
Are the roads within the development designed as "Complete Streets?"			
Does the development include historic preservation or adaptive reuse of existing facilities?			

Does the development include historic preservation, or adaptive reuse on-site? Does the site's location, scale or use support any historic building conditions off site within its context?			
Does the development provide or increase the following: <b>A mix of land use types? Please list.</b>			
<b>Housing diversity by type and income?</b>			
<b>Civic and public spaces (or have proximity to them)?</b>			
<b>Recreation facilities and green space/parks (or have proximity to them) and is it part of an integrated ecological network?</b>			
Land use densities greater than the current zoning or surrounding context?			
<b>Alternative parking designs such as reduced parking ratios, a percentage of compact stalls, banked parking, shared parking, priority parking for low emission vehicles and provisions for bicycle storage?</b>			
Local food production, access to off-site facilities or opportunities for Community Supported Agriculture (CSA) or <a href="#">farmers' markets</a> ?			
A plan for promoting and educating people on green features?			
<b>Open space?</b>			
<b>Natural features?</b>			
Regional stormwater management?			
Is the site part of a district energy or water infrastructure?			

**2. Site development**

Green Design strategies for Site Development generally refer to how to “design with nature” or build on an individual site so that disturbance to the site is minimal to none. It is important that the design considers short term resiliency and long term sustainability solutions. This can be accomplished using some or below all of the strategies.

In general, does the design provide for the following?

<b>SITE DEVELOPMENT</b>	<b>YES</b>	<b>NO</b>	<b>DESCRIPTION</b>
<b>Minimum site disturbance during construction?</b>			
Increased Erosion and Sedimentation Control (beyond county or municipal requirements)?			
<b>Low Impact Design features?</b>			

Bio-swales				
<a href="#">Rain gardens</a>				
<a href="#">Green Roofs</a>				
Pervious pavements				
Green Walls				
<a href="#">Trees</a>				
Indigenous species (non-invasive species, low maintenance landscaping)?				
Onsite management of vegetative waste?				
Regenerative Design?				
Habitat, wetlands or water body conservation or conservation management strategies				
Habitat, wetlands or water body restoration				
Does the site minimize heat island effects through reduced paving, landscaping or other methods?				
Does the site provide alternatives to single occupancy vehicles such as van spaces, bike storage and changing facilities, and alternative energy vehicle parking?				
Does the development include historic preservation or adaptive reuse of existing facilities?				
Does the site include public art and opportunities for civic events?				
Does the site include <a href="#">Light Pollution Reduction</a> and energy efficient site lighting and controls?				
Does the site consider landscape and stormwater maintenance specifications that employ integrated pest management post-bond to assure implementation for five years after occupancy?				

### 3. Green Building

“Green buildings” utilize a sensitivity to the environment in their design by incorporating strategies like energy and water efficiency, high indoor air quality, and sustainably sourced (or recycled) materials. Green buildings are the foundation for a sustainable neighborhood and should be considered where new developments are planned.

This checklist lists important green building design aspects in the areas of Water Reduction, Energy, Indoor Air Quality, Materials, and Social features. Communities and developers should use this checklist to identify features to incorporate into their site plan or subdivision planning.

GREEN BUILDING	YES	NO	DESCRIPTION
Does the building(s) meet the criteria for a <a href="#">Certified Green Building</a> ?			
Is the building oriented to maximize benefits of daylighting, viewsheds and energy and to minimize detrimental impacts on surrounding sites?			
Does the building respect the scale of the context through its design?			
<b>Water Reduction</b>			
Does the building provide a 20% or greater reduction of water use beyond the minimum water efficiency standards set by the EPA or local government, whichever is greater?			
Does the building employ water conservation features – including low-flow fixtures, waterless urinals, and/or sensor-controlled faucets?			
Does the building incorporate rainwater, gray water + stormwater capture and re-use?			
Is wastewater treated on site and recharged to the ground?			
<b>Energy</b>			
Does the building reduce energy usage through efficient heating and cooling, geothermal technology, enhanced daylighting, efficient lighting, occupant controls and an efficient building envelope?			
Does the project incorporate Energy Star-labeled building products?			
Does the building include onsite energy generation?			
What is the anticipated energy savings?			
What are the anticipated carbon emission reductions?			
<b>Indoor Air Quality</b>			
Is natural ventilation and efficient use of outdoor air during heating and cooling periods utilized?			
Are other measures being used to improve indoor air quality? Please describe			
<b>Materials</b>			
Is an existing building being reused? 100%, 75%, 50%?			
Are there construction waste management plans in place?			

Are there solid waste management plans in place?				
Are building materials reused?				
Do building materials contain recycled content?				
Are building materials sourced within the region (within a 500 mile radius)?				
<b>Social</b>				
Does the site implement indigenously inspired art in the landscape? (i.e. sculpture; garden; mural/ relief; artistic site furnishing, etc.) - one application per building or per 300 residential units.				

# APPENDIX

## 9

# RESIDENTIAL NEW CONSTRUCTION INCENTIVES

## FY23 Residential New Construction Incentive Table

	<b>Single Home</b> (1 & 2 Family Home)	<b>Townhouse</b> (3+ Connected Units)	<b>Multifamily</b> (low rise; 3 stories or less; 3+ units)	<b>MFHR - Multifamily High Rise</b> (5+ units; 4+ stories) <small>Only applicable to building permits pulled prior to July 1, 2021</small>	<b>MFNC - Multifamily New Construction</b> (3+ units; any stories)
<b>Energy Star</b>	\$1,000 per home + \$30 for each MMBtu (determined by the Rater after construction)	\$500 per home + \$30 for each MMBtu (determined by the Rater after construction)	\$500 per home + \$30 for each MMBtu (determined by the Rater after construction)	\$500 per home + \$30 for each MMBtu (determined by the Rater after construction)	\$500 per home + \$30 for each MMBtu (determined by the Rater after construction)
<b>ZERH</b> (Zero Energy Ready Home)	\$4,000 per home + \$30 for each MMBtu (determined by the Rater after construction)  Rater Incentive: \$1,200 per home	\$2,500 per home + \$30 for each MMBtu (determined by the Rater after construction)  Rater Incentive: \$1,200 per home	\$1,500 per home + \$30 for each MMBtu (determined by the Rater after construction)	N/A	N/A
<b>ZERH + RE</b> (Zero Energy Ready Home +Renewable Ready Home)	\$4,000 per home + \$30 for each MMBtu (determined by the Rater after construction) + \$2,000 bonus  Rater Incentive: \$1,200 per home	\$2,500 per home + \$30 for each MMBtu (determined by the Rater after construction) + \$1,500 bonus  Rater Incentive: \$1,200 per home	\$1,500 per home + \$30 for each MMBtu (determined by the Rater after construction) + \$750 bonus	N/A	N/A
<b>UEZ/Affordable House Bonus</b>	+\$500 per home (added to any level above)	+\$500 per home (added to any level above)	N/A	N/A	N/A

### Notes:

- The above \$30/MMBTU is based on savings before any savings from Renewable Energy. RE represents renewable energy to offset the remaining annual energy load. MMBtu is the incremental annual MMBtu saved as compared to the calculated annual usage of the baseline reference home, defined by the applicable energy code as described in more detail in the New Jersey Clean Energy Program Protocols to Measure Resource Savings.
- UEZ Bonus requires verification of the home being in a designated Urban Enterprise Zone.
- For the affordable Housing bonus incentive, submit a copy of an official document that identifies the dwelling as participating in a federal, state, or local affordable housing program. This includes, by way of example only, the New Jersey Department of Community Affairs listing of Affordable Housing available here <https://www.state.nj.us/dca/divisions/codes/publications/developments.html>.
- This table is only for Dwelling Units and single-room occupancy (SRO) units. As relevant to this table, SROs are limited to buildings of less than five (5) units; buildings with five (5) or more SRO units may be eligible to participate in the MFNC program.
- Effective July 1, 2021, the EPA released an updated version of their Multifamily program that allows both low and high rise to participate. If your multifamily project has 3 or more units and an application date to the EPA, NJCEP, or the building department that is July 1, 2021 or later, the project should follow the EPA MFNC pathway.

# **APPENDIX**

## **10**

### **MODEL ENERGY STORAGE ORDINANCE, CHECKLIST, AND PERMIT**

# Battery Energy Storage System Model Law

For local governments to utilize when drafting local laws and regulations for battery energy storage systems.



**NYSERDA**

Battery Energy Storage System Guidebook for Local Governments  
NYSERDA 17 Columbia Circle Albany, NY 12203

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# Overview

The Model Law is intended to help local government officials and AHJs adopt legislation and regulations to responsibly accommodate battery energy storage systems in their communities. The Model Law lays out procedural frameworks and substantive requirements for residential, commercial, and utility-scale battery energy storage systems.

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**The workable version of this document can be found at [nyserdera.ny.gov/Energy-Storage-Guidebook](https://nyserdera.ny.gov/Energy-Storage-Guidebook), under Battery Energy Storage System Model Law tab.**

## 1. Instructions

1. This Model Law can be adopted by the governing board of cities, towns, and villages (hereinafter “local governments” or “municipalities”) to regulate the installation, operation, maintenance, and decommissioning of battery energy storage systems. The Model Law is intended to be an “all-inclusive” local law, regulating the subject of battery energy storage systems under typical zoning and land use regulations and it includes the process for compliance with the State Environmental Quality Review Act. Municipalities should review this Model Law, examine their local laws and regulations and the types, size range and number of battery energy storage system projects proposed, and adopt a local law addressing the aspects of battery energy storage system development that make the most sense for each municipality, deleting, modifying, or adding other provisions as appropriate.
2. This Model Law references a “Battery Energy Storage System Model Permit” that is available as part of NYSERDA’s Battery Energy Storage Guidebook. The Model Permit is intended to help local government officials and AHJs establish the minimum submittal requirements for electrical and structural plan review that are necessary when permitting residential and small commercial battery energy storage systems.
3. In some cases, there may be multiple approaches to regulate a certain aspect of battery energy storage systems. The word “OR” has been placed in the text of the model law to indicate these options. Municipalities should choose the option that works best for their communities. The content provided in brackets and highlighted is optional. Depending on local circumstances, a municipality may want to include this content or choose to adopt a different standard.
4. The Model Law is not intended for adoption precisely as it is written. It is intended to be advisory only, and users should not rely upon it as legal advice. A municipality is not required to adopt this Model Law. Municipal officials are urged to seek legal advice from their attorneys before enacting a battery energy storage system law. Municipalities must carefully consider how the language in this Model Law may be modified to suit local conditions, comprehensive plans, and existing land use and zoning provisions.

5. Before enacting this Model Law, a comprehensive plan outlining the goals and policies for the installation, operation, maintenance, and decommissioning of battery energy storage systems must be adopted by the local governing board (city or common council, town board, village board of trustees). Some local governing boards can satisfy this requirement by updating an existing comprehensive plan while others must adopt a new comprehensive plan. Suggestions on how local governing boards can develop and adopt in their existing or new comprehensive plans battery energy storage system friendly policies and plans that provide local protection are listed below:
  - A. Adopt a resolution or policy statement that outlines a strategy for municipal-wide battery energy storage system development. The chief executive officer of a local government (like a town supervisor or city or village mayor) may choose to issue in accordance with its local charter or other valid local law or regulations an executive order, proclamation or other declaration to advance battery energy storage system development.
  - B. Appoint a Battery Energy Storage Task Force (“Task Force”) that represents all interested stakeholders, including residents, businesses, interested non-profit organizations, the battery energy storage industry, utilities, and relevant municipal officials and staff to prepare an action plan, adopt or amend a comprehensive plan to include battery energy storage system planning goals and actions, and develop local laws and/or other regulations to ensure the orderly development of battery energy storage system projects.
  - C. Charge the Task Force with conducting meetings on a communitywide basis to involve all key stakeholders, gather all available ideas, identify divergent groups and views, and secure support from the entire community. The Task Force should also conduct studies and determine whether existing policies, plans, and land use regulations require amendments to remove barriers to and facilitate battery energy storage system development goals.
  - D. Establish a training program for local staff and land use boards. Municipalities are encouraged to utilize State and Federal technical assistance and grants for training programs when available.
  - E. Partner with adjacent communities to adopt compatible policies, plan components, and zoning provisions for battery energy storage system projects. County or regional planning agencies may also advise participating local governments on locally addressing these issues.

# 2. Model Law

## 1. Authority

This Battery Energy Storage System Law is adopted pursuant to Article IX of the New York State Constitution, §2(c)(6) and (10), New York Statute of Local Governments, § 10 (1) and (7); [Select one: sections 261-263 of the Town Law / sections 7-700 through 7-704 of the Village Law / sections 19 and 20 of the City Law and section 10 of the Municipal Home Rule Law] of the State of New York, which authorize the [Village/Town/City] to adopt zoning provisions that advance and protect the health, safety and welfare of the community.

## 2. Statement of Purpose

This Battery Energy Storage System Law is adopted to advance and protect the public health, safety, welfare, and quality of life of [Village/Town/City] by creating regulations for the installation and use of battery energy storage systems, with the following objectives:

- A. To provide a regulatory scheme for the designation of properties suitable for the location, construction and operation of battery energy storage systems;
- B. To ensure compatible land uses in the vicinity of the areas affected by battery energy storage systems;
- C. To mitigate the impacts of battery energy storage systems on environmental resources such as important agricultural lands, forests, wildlife and other protected resources; and
- D. To create synergy between battery energy storage system development and [other stated goals of the community pursuant to its Comprehensive Plan].

## 3. Definitions

As used in this [Article/Chapter], the following terms shall have the meanings indicated:

**ANSI:** American National Standards Institute

**BATTERY(IES):** A single cell or a group of cells connected together electrically in series, in parallel, or a combination of both, which can charge, discharge, and store energy electrochemically. For the purposes of this law, batteries utilized in consumer products are excluded from these requirements.

**BATTERY ENERGY STORAGE MANAGEMENT SYSTEM:** An electronic system that protects energy storage systems from operating outside their safe operating parameters and disconnects electrical power to the energy storage system or places it in a safe condition if potentially hazardous temperatures or other conditions are detected.

**BATTERY ENERGY STORAGE SYSTEM:** One or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time, not to include a stand-alone 12-volt car battery or an electric motor vehicle. A battery energy storage system is classified as a Tier 1 or Tier 2 Battery Energy Storage System as follows:

- A. Tier 1 Battery Energy Storage Systems have an aggregate energy capacity less than or equal to 600kWh and, if in a room or enclosed area, consist of only a single energy storage system technology.
- B. Tier 2 Battery Energy Storage Systems have an aggregate energy capacity greater than 600kWh or are comprised of more than one storage battery technology in a room or enclosed area.

**CELL:** The basic electrochemical unit, characterized by an anode and a cathode, used to receive, store, and deliver electrical energy.

**COMMISSIONING:** A systematic process that provides documented confirmation that a battery energy storage system functions according to the intended design criteria and complies with applicable code requirements.

**DEDICATED-USE BUILDING:** A building that is built for the primary intention of housing battery energy storage system equipment, is classified as Group F-1 occupancy as defined in the International Building Code, and complies with the following:

- 1) The building's only use is battery energy storage, energy generation, and other electrical grid-related operations.
- 2) No other occupancy types are permitted in the building.
- 3) Occupants in the rooms and areas containing battery energy storage systems are limited to personnel that operate, maintain, service, test, and repair the battery energy storage system and other energy systems.
- 4) Administrative and support personnel are permitted in areas within the buildings that do not contain battery energy storage system, provided the following:
  - a. The areas do not occupy more than 10 percent of the building area of the story in which they are located.
  - b. A means of egress is provided from the administrative and support use areas to the public way that does not require occupants to traverse through areas containing battery energy storage systems or other energy system equipment.

**ENERGY CODE:** The New York State Energy Conservation Construction Code adopted pursuant to Article 11 of the Energy Law, as currently in effect and as hereafter amended from time to time.

**FIRE CODE:** The fire code section of the New York State Uniform Fire Prevention and Building Code adopted pursuant to Article 18 of the Executive Law, as currently in effect and as hereafter amended from time to time.

**NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL):** A U.S. Department of Labor designation recognizing a private sector organization to perform certification for certain products to ensure that they meet the requirements of both the construction and general industry OSHA electrical standards.

**NEC:** National Electric Code.

**NFPA:** National Fire Protection Association.

**NON-DEDICATED-USE BUILDING:** All buildings that contain a battery energy storage system and do not comply with the dedicated-use building requirements.

**NON-PARTICIPATING PROPERTY:** Any property that is not a participating property.

**NON-PARTICIPATING RESIDENCE:** Any residence located on non-participating property.

**OCCUPIED COMMUNITY BUILDING:** Any building in Occupancy Group A, B, E, I, R, as defined in the International Building Code, including but not limited to schools, colleges, daycare facilities, hospitals, correctional facilities, public libraries, theaters, stadiums, apartments, hotels, and houses of worship.

**PARTICIPATING PROPERTY:** A battery energy storage system host property or any real property that is the subject of an agreement that provides for the payment of monetary compensation to the landowner from the battery energy storage system owner (or affiliate) regardless of whether any part of a battery energy storage system is constructed on the property.

**UNIFORM CODE:** the New York State Uniform Fire Prevention and Building Code adopted pursuant to Article 18 of the Executive Law, as currently in effect and as hereafter amended from time to time.

#### **4. Applicability**

- A. The requirements of this Local Law shall apply to all battery energy storage systems permitted, installed, or modified in [Village/Town/City] after the effective date of this Local Law, excluding general maintenance and repair.
- B. Battery energy storage systems constructed or installed prior to the effective date of this Local Law shall not be required to meet the requirements of this Local Law.
- C. Modifications to, retrofits or replacements of an existing battery energy storage system that increase the total battery energy storage system designed discharge duration or power rating shall be subject to this Local Law.

#### **5. General Requirements**

- A. A building permit and an electrical permit shall be required for installation of all battery energy storage systems.
- B. Issuance of permits and approvals by the [Reviewing Board] shall include review pursuant to the State Environmental Quality Review Act [ECL Article 8 and its implementing regulations at 6 NYCRR Part 617 (“SEQRA”).
- C. All battery energy storage systems, all Dedicated Use Buildings, and all other buildings or structures that (1) contain or are otherwise associated with a battery energy storage system and (2) subject to the Uniform Code and/or the Energy Code shall be designed, erected, and installed in accordance with all applicable provisions of the Uniform Code, all applicable provisions of the Energy Code, and all applicable provisions of the codes, regulations, and industry standards as referenced in the Uniform Code, the Energy Code, and the [Village/Town/City] Code.

#### **6. Permitting Requirements for Tier 1 Battery Energy Storage Systems**

Tier 1 Battery Energy Storage Systems shall be permitted in all zoning districts, subject to the Uniform Code and the “Battery Energy Storage System Permit,” and exempt from site plan review.

#### **7. Permitting Requirements for Tier 2 Battery Energy Storage Systems**

Tier 2 Battery Energy Storage Systems are permitted through the issuance of a [special use permit] within the [XXXXXXXXXXXXXXXX, XXXXXXXXXXXX, XXXXXXXXXXXX] zoning districts, and shall be subject to the Uniform Code and the site plan application requirements set forth in this Section.

- A. Applications for the installation of Tier 2 Battery Energy Storage System shall be:
  - 1) reviewed by the [Code Enforcement/Zoning Enforcement Officer or Reviewing Board] for completeness. An application shall be complete when it addresses all matters listed in this Local Law including, but not necessarily limited to, (i) compliance with all applicable provisions of the Uniform Code and all applicable provisions of the Energy Code and (ii) matters relating to the proposed battery energy storage system and Floodplain, Utility Lines and Electrical Circuitry, Signage, Lighting, Vegetation and Tree-cutting, Noise, Decommissioning, Site Plan and Development, Special Use and Development, Ownership Changes, Safety, and Permit Time Frame and Abandonment. Applicants shall be advised within [10] business days of the completeness of their application or any deficiencies that must be addressed prior to substantive review.
  - 2) subject to a public hearing to hear all comments for and against the application. The [Reviewing Board] of the [Village/Town/City] shall have a notice printed in a newspaper of general circulation in the [Village/Town/City] at least [5] days in advance of such hearing. Applicants shall have delivered the notice by first class mail to adjoining landowners or landowners within [200] feet of the property at least [10] days prior to such a hearing. Proof of mailing shall be provided to the [Reviewing Board] at the public hearing.
  - 3) referred to the [County Planning Department] pursuant to General Municipal Law § 239-m if required.
  - 4) upon closing of the public hearing, the [Reviewing Board] shall take action on the application within 62 days of the public hearing, which can include approval, approval with conditions, or denial. The 62-day period may be extended upon consent by both the [Reviewing Board] and Applicant.
- B. Utility Lines and Electrical Circuitry. All on-site utility lines shall be placed underground to the extent feasible and as permitted by the serving utility, with the exception of the main service connection at the utility company right-of-way and any new interconnection equipment, including without limitation any poles, with new easements and right-of-way.

### C. Signage.

- 1) The signage shall be in compliance with ANSI Z535 and shall include the type of technology associated with the battery energy storage systems, any special hazards associated, the type of suppression system installed in the area of battery energy storage systems, and 24-hour emergency contact information, including reach-back phone number.
- 2) As required by the NEC, disconnect and other emergency shutoff information shall be clearly displayed on a light reflective surface. A clearly visible warning sign concerning voltage shall be placed at the base of all pad-mounted transformers and substations.

D. Lighting. Lighting of the battery energy storage systems shall be limited to that minimally required for safety and operational purposes and shall be reasonably shielded and downcast from abutting properties.

E. Vegetation and tree-cutting. Areas within [10] feet on each side of Tier 2 Battery Energy Storage Systems shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees, shrubbery, or cultivated ground cover such as green grass, ivy, succulents, or similar plants used as ground covers shall be permitted to be exempt provided that they do not form a means of readily transmitting fire. Removal of trees should be minimized to the extent possible.

F. Noise. The [1-hour] average noise generated from the battery energy storage systems, components, and associated ancillary equipment shall not exceed a noise level of [60] dBA as measured at the outside wall of any non-participating residence or occupied community building. Applicants may submit equipment and component manufacturers noise ratings to demonstrate compliance. The applicant may be required to provide Operating Sound Pressure Level measurements from a reasonable number of sampled locations at the perimeter of the battery energy storage system to demonstrate compliance with this standard.

### G. Decommissioning.

- 1) Decommissioning Plan. The applicant shall submit a decommissioning plan, developed in accordance with the Uniform Code, to be implemented upon abandonment and/or in conjunction with removal from the facility. The decommissioning plan shall include:
  - a. A narrative description of the activities to be accomplished, including who will perform that activity and at what point in time, for complete physical removal of all battery energy storage system components, structures, equipment, security barriers, and transmission lines from the site;
  - b. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations;
  - c. The anticipated life of the battery energy storage system;
  - d. The estimated decommissioning costs and how said estimate was determined;
  - e. The method of ensuring that funds will be available for decommissioning and restoration;
  - f. The method by which the decommissioning cost will be kept current;
  - g. The manner in which the site will be restored, including a description of how any changes to the surrounding areas and other systems adjacent to the battery energy storage system, such as, but not limited to, structural elements, building penetrations, means of egress, and required fire detection suppression systems, will be protected during decommissioning and confirmed as being acceptable after the system is removed; and
  - h. A listing of any contingencies for removing an intact operational energy storage system from service, and for removing an energy storage system from service that has been damaged by a fire or other event.
- 2) Decommissioning Fund. The owner and/or operator of the energy storage system, shall continuously maintain a fund or bond payable to the [Village/Town/City], in a form approved by the [Village/Town/City] for the removal of the battery energy storage system, in an amount to be determined by the [Village/Town/City], for the period of the life of the facility. This fund may consist of a letter of credit from a State of New York licensed-financial institution. All costs of the financial security shall be borne by the applicant.

H. Site plan application. For a Tier 2 Battery Energy Storage System requiring a Special Use Permit, site plan approval shall be required. Any site plan application shall include the following information:

- 1) Property lines and physical features, including roads, for the project site.
- 2) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, and screening vegetation or structures.
- 3) A [one- or three-line] electrical diagram detailing the battery energy storage system layout, associated components, and electrical interconnection methods, with all National Electrical Code compliant disconnects and over current devices.
- 4) A preliminary equipment specification sheet that documents the proposed battery energy storage system components, inverters and associated electrical equipment that are to be installed. A final equipment specification sheet shall be submitted prior to the issuance of building permit.
- 5) Name, address, and contact information of proposed or potential system installer and the owner and/or operator of the battery energy storage system. Such information of the final system installer shall be submitted prior to the issuance of building permit.
- 6) Name, address, phone number, and signature of the project Applicant, as well as all the property owners, demonstrating their consent to the application and the use of the property for the battery energy storage system.
- 7) Zoning district designation for the parcel(s) of land comprising the project site.
- 8) Commissioning Plan. Such plan shall document and verify that the system and its associated controls and safety systems are in proper working condition per requirements set forth in the Uniform Code. Where commissioning is required by the Uniform Code, Battery energy storage system commissioning shall be conducted by a New York State (NYS) Licensed Professional Engineer after the installation is complete but prior to final inspection and approval. A corrective action plan shall be developed for any open or continuing issues that are allowed to be continued after commissioning. A report describing the results of the system commissioning and including the results of the initial acceptance testing required in the Uniform Code shall be provided to [Code Enforcement/Zoning Enforcement Officer or Reviewing Board] prior to final inspection and approval and maintained at an approved on-site location.
- 9) Fire Safety Compliance Plan. Such plan shall document and verify that the system and its associated controls and safety systems are in compliance with the Uniform Code.
- 10) Operation and Maintenance Manual. Such plan shall describe continuing battery energy storage system maintenance and property upkeep, as well as design, construction, installation, testing and commissioning information and shall meet all requirements set forth in the Uniform Code.
- 11) Erosion and sediment control and storm water management plans prepared to New York State Department of Environmental Conservation standards, if applicable, and to such standards as may be established by the Planning Board.
- 12) Prior to the issuance of the building permit or final approval by the [Reviewing Board], but not required as part of the application, engineering documents must be signed and sealed by a NYS Licensed Professional Engineer.
- 13) Emergency Operations Plan. A copy of the approved Emergency Operations Plan shall be given to the system owner, the local fire department, and local fire code official. A permanent copy shall also be placed in an approved location to be accessible to facility personnel, fire code officials, and emergency responders. The emergency operations plan shall include the following information:
  - a. Procedures for safe shutdown, de-energizing, or isolation of equipment and systems under emergency conditions to reduce the risk of fire, electric shock, and personal injuries, and for safe start-up following cessation of emergency conditions.
  - b. Procedures for inspection and testing of associated alarms, interlocks, and controls.
  - c. Procedures to be followed in response to notifications from the Battery Energy Storage Management System, when provided, that could signify potentially dangerous conditions, including shutting down equipment, summoning service and repair personnel, and providing agreed upon notification to fire department personnel for potentially hazardous conditions in the event of a system failure.

- d. Emergency procedures to be followed in case of fire, explosion, release of liquids or vapors, damage to critical moving parts, or other potentially dangerous conditions. Procedures can include sounding the alarm, notifying the fire department, evacuating personnel, de-energizing equipment, and controlling and extinguishing the fire.
- e. Response considerations similar to a safety data sheet (SDS) that will address response safety concerns and extinguishment when an SDS is not required.
- f. Procedures for dealing with battery energy storage system equipment damaged in a fire or other emergency event, including maintaining contact information for personnel qualified to safely remove damaged battery energy storage system equipment from the facility.
- g. Other procedures as determined necessary by the [Village/Town/City] to provide for the safety of occupants, neighboring properties, and emergency responders.
- h. Procedures and schedules for conducting drills of these procedures and for training local first responders on the contents of the plan and appropriate response procedures.

I. Special Use Permit Standards.

- 1) Setbacks. Tier 2 Battery Energy Storage Systems shall comply with the setback requirements of the underlying zoning district for principal structures.
- 2) Height. Tier 2 Battery Energy Storage Systems shall comply with the building height limitations for principal structures of the underlying zoning district.
- 3) Fencing Requirements. Tier 2 Battery Energy Storage Systems, including all mechanical equipment, shall be enclosed by a [7-foot-high] fence with a self-locking gate to prevent unauthorized access unless housed in a dedicated-use building and not interfering with ventilation or exhaust ports.
- 4) Screening and Visibility. Tier 2 Battery Energy Storage Systems shall have views minimized from adjacent properties to the extent reasonably practicable using architectural features, earth berms, landscaping, or other screening methods that will harmonize with the character of the property and surrounding area and not interfering with ventilation or exhaust ports.

J. Ownership Changes. If the owner of the battery energy storage system changes or the owner of the property changes, the special use permit shall remain in effect, provided that the successor owner or operator assumes in writing all of the obligations of the special use permit, site plan approval, and decommissioning plan. A new owner or operator of the battery energy storage system shall notify the [Code Enforcement/Zoning Enforcement Officer] of such change in ownership or operator within [30] days of the ownership change. A new owner or operator must provide such notification to the [Code Enforcement/Zoning Enforcement Officer] in writing. The special use permit and all other local approvals for the battery energy storage system would be void if a new owner or operator fails to provide written notification to the [Code Enforcement/Zoning Enforcement Officer] in the required timeframe. Reinstatement of a void special use permit will be subject to the same review and approval processes for new applications under this Local Law.

## 8. Safety

A. System Certification. Battery energy storage systems and equipment shall be listed by a Nationally Recognized Testing Laboratory to UL 9540 (Standard for battery energy storage systems and Equipment) or approved equivalent, with subcomponents meeting each of the following standards as applicable:

- 1) UL 1973 (Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail Applications),
- 2) UL 1642 (Standard for Lithium Batteries),
- 3) UL 1741 or UL 62109 (Inverters and Power Converters),
- 4) Certified under the applicable electrical, building, and fire prevention codes as required.
- 5) Alternatively, field evaluation by an approved testing laboratory for compliance with UL 9540 (or approved equivalent) and applicable codes, regulations and safety standards may be used to meet system certification requirements.

B. Site Access. Battery energy storage systems shall be maintained in good working order and in accordance with industry standards. Site access shall be maintained, including snow removal at a level acceptable to the local fire department and, if the Tier 2 Battery Energy Storage System is located in an ambulance district, the local ambulance corps.

C. Battery energy storage systems, components, and associated ancillary equipment shall have required working space clearances, and electrical circuitry shall be within weatherproof enclosures marked with the environmental rating suitable for the type of exposure in compliance with NFPA 70.

## 9. Permit Time Frame and Abandonment

- A. The Special Use Permit and site plan approval for a battery energy storage system shall be valid for a period of [24] months, provided that a building permit is issued for construction [and/or] construction is commenced. In the event construction is not completed in accordance with the final site plan, as may have been amended and approved, as required by the [Reviewing Board], within [24] months after approval, [Village/Town/City] may extend the time to complete construction for [180] days. If the owner and/or operator fails to perform substantial construction after [36] months, the approvals shall expire.
- B. The battery energy storage system shall be considered abandoned when it ceases to operate consistently for [more than one year]. If the owner and/or operator fails to comply with decommissioning upon any abandonment, the [Village/Town/City] may, at its discretion, enter the property and utilize the available bond and/or security for the removal of a Tier 2 Battery Energy Storage System and restoration of the site in accordance with the decommissioning plan.

## 10. Enforcement

Any violation of this Battery Energy Storage System Law shall be subject to the same enforcement requirements, including the civil and criminal penalties, provided for in the zoning or land use regulations of [Village/Town/City].

## 11. Severability

The invalidity or unenforceability of any section, subsection, paragraph, sentence, clause, provision, or phrase of the aforementioned sections, as declared by the valid judgment of any court of competent jurisdiction to be unconstitutional, shall not affect the validity or enforceability of any other section, subsection, paragraph, sentence, clause, provision, or phrase, which shall remain in full force and effect.

# Questions?

If you have any questions about the Battery Energy Storage System Model Law, please email questions to [cleanenergyhelp@nyserda.ny.gov](mailto:cleanenergyhelp@nyserda.ny.gov) or request free technical assistance at [nyserda.ny.gov/Energy-Storage-Guidebook](https://nyserda.ny.gov/Energy-Storage-Guidebook). The NYSERDA team looks forward to partnering with communities across the State.

# Battery Energy Storage System Model Permit

Understanding the permitting requirements of residential and small commercial battery energy storage systems.



**NYSERDA**

Battery Energy Storage System Guidebook for Local Governments  
NYSERDA 17 Columbia Circle Albany, NY 12203

# Section Contents

1. Battery Energy Storage System Model Permit . . . . . 17

# Overview

The Model Permit is intended to help local government officials and AHJs establish the minimum submittal requirements for electrical and structural plan review that are necessary when permitting residential and small commercial battery energy storage systems.

Additionally, battery energy storage systems shall comply with all applicable provisions of the codes, regulations, and industry standards as referenced in the New York State Uniform Fire Prevention and Building Code.

The Battery Energy Storage System Model Permit is based on the 14th Edition of the National Electric Code (NEC), which is anticipated to be adopted by New York State in 2020. NYSERDA will continue to update the Guidebook as these codes and standards evolve.

The workable version of this document can be found at [nyserderda.ny.gov/Energy-Storage-Guidebook](https://nyserderda.ny.gov/Energy-Storage-Guidebook), under Battery Energy Storage System Model Permit tab.

## PERMIT APPLICATION

# Battery Energy Storage System Model Permit

Note: Language in [ALL CAPS] below indicates where local jurisdictions need to provide information specific to the jurisdiction. Language in italics indicates explanatory notes from the authors of this document that may be deleted from the distributed version.

## SUBMITTAL INSTRUCTIONS

This application and the following attachments will constitute the Battery Energy Storage System Permitting Package.

- This application form, with all fields completed and bearing relevant signatures.
- Permitting fee of \$[ENTER FEE HERE], payable by [ENTER VALID PAYMENT METHODS, If checks are allowed INCLUDING WHO CHECKS SHOULD BE MADE PAYABLE TO]
- Required Construction Documents for the battery energy storage system being installed, including required attachments.

Completed permit applications can be submitted electronically to [EMAIL ADDRESS] or in person at [BUILDING DEPARTMENT ADDRESS] during business hours [INDICATE BUSINESS HOURS].

## APPLICATION REVIEW TIMELINE

Permit determinations will be issued within [TIMELINE] calendar days upon receipt of complete and accurate applications. The municipality will provide feedback within [TIMELINE] calendar days of receiving incomplete or inaccurate applications.

## FOR FURTHER INFORMATION

Questions about this permitting process may be directed to [MUNICIPAL CONTACT INFORMATION].

## PROPERTY OWNER

Property Owner's First Name

Last Name

Title

Property Address

City

State

Zip

Section

Block

Lot Number

## EXISTING USE

Residential

Commercial

## PROVIDE THE TOTAL SYSTEM CAPACITY RATING

Total System Capacity Rating: \_\_\_\_\_ kWh

Power Rating: \_\_\_\_\_ kW (Select One)  AC or  DC

## SELECT SYSTEM CONFIGURATION

AC Coupled

DC Coupled

Standalone

## SELECT BATTERY TYPE

Lithium-ion, all types

Lead-acid, all types

Nickel-cadmium (Ni-Cd)

Flow batteries

Other: \_\_\_\_\_

## SELECT INSTALLATION TYPE

Indoor

Outdoor

Attached/Detached/Open Garage

Rooftop

Dedicated Use Building

## BATTERY ENERGY STORAGE SYSTEM INSTALLATION CONTRACTOR

Contractor Business Name

Contractor Business Address

City

State

Zip

Contractor Contact Name

Phone Number

Contractor License Number(s)

Contractor Email

---

Electrician Business Name

---

Electrician Business Address

City

State

Zip

---

Electrician Contact Name

Phone Number

---

Electrician License Number(s)

Electrician Email

Please sign below to affirm that all answers are correct and that you have met all the conditions and requirements to participate in this unified process.

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Property Owner's Signature

Date

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Battery Energy Storage System Company Representative Signature

Date

## PERMITS AND APPROVALS REQUIRED

The following permits are the minimum requirements for battery energy storage systems installed with an aggregate energy capacity less than or equal to 600kWh and, if in a room or indoor area, where only a single energy storage system technology is provided.

1. Battery Energy Storage System Permit
2. [LIST TYPE OF PERMIT(S) REQUIRED BY THE LOCAL JURISDICTION, i.e., ELECTRICAL OR BUILDING PERMIT].

## SUBMITTAL REQUIREMENTS

In order to submit a complete permit application for a new battery energy storage system, the applicant must include:

- a) Completed Application form.
- b) Construction Documents, with listed attachments. Construction Documents must be stamped and signed by a New York State Licensed Professional Engineer.

### General Requirements

- Minimum plan size is 11"x17" with a minimum font of 10.
  - Include 4 full sets of plans and 2 sets of supporting documents.
- Include the applicable codes on the cover sheet for the project.
- Include the complete scope of work on the cover sheet for the project.
- All battery energy storage systems, all dedicated use buildings, and all other buildings or structures that (1) contain or are otherwise associated with a battery energy storage system and (2) subject to the NYS Uniform Fire Prevention and Building Code (Uniform Code) and/or the NYS Energy Conservation Construction Code (Energy Code) shall be designed, erected, and installed in accordance with all applicable provisions of the Uniform Code, all applicable provisions of the Energy Code, and all applicable provisions of the codes, regulations, and industry standards as referenced in the Uniform Code, the Energy Code, and the [Village/Town/City] Code.

### **Site Plan and Floor Plan Requirements**

- Include a legend or key for the site and floor plan with equipment symbols.
- The site plan shall include:
  - The location of the structure and the location where the system is to be installed.
  - Show conduit/cable routing of battery energy storage system.
  - Include underground trench detail, if applicable.
  - Show overhead runs, if applicable.
  - Show method and location of required ventilation equipment (if required) for indoor installations.
- Identify the total number of batteries.
- The floor plan shall include:
  - New equipment for the battery energy storage system.
  - Existing equipment for interconnection.
  - Show required working clearances for all existing/new electrical equipment.
  - Show whether the equipment is to be installed indoors or outdoors.
  - Show method and location of requirement ventilation equipment (if required) for indoor installations.
  - Show method of protection from physical damage for the battery energy storage system.
  - Show means of access to battery energy storage system.
  - Denote whether conductors are routed indoors or outdoors.
- Provide an elevation drawing of the system equipment and specify elevation in relation to flood plains.
  - If the building is in a flood zone, it shall be above base flood elevation.
- Provide supporting documents from manufacturer if equipment is subject to physical damage.

### **Electrical**

- Installations shall be in compliance with the Battery Energy Storage System Electrical Checklist. The Battery Energy Storage System Electrical Checklist provides an overview of common points of inspection for which the applicant should be prepared to show compliance.
- One or Three-Line Diagram
  - Show grounding and bonding for the battery energy storage system, including the ground return path.
  - Show method of interconnection.
  - Show overcurrent protection method and rating when required.
  - Include detailed wiring information for all new circuits, including:
    - > Conductor size/type
    - > Number of conductors
    - > Conduit size
    - > Conduit type
  - Show all disconnection means.
  - Show ratings (voltage, ampacity, environmental, etc) for new and existing service equipment.

- Specifications and installation instructions
  - Provide specification sheets and installation instructions for the following equipment:
    - > Batteries
    - > Inverter
    - > Transformer or autotransformer
    - > Transfer switch(es)
    - > ESS support or racking
    - > Converters
    - > Interconnecting cables and connectors
    - > Management system, including charge controller(s)
    - > Panelboards
    - > HVAC/thermal management system
    - > Fire rated material
  - An approved energy storage management system shall be provided for battery technologies other than lead-acid and nickel cadmium for monitoring and balancing cell voltages, currents, and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.

**Fire Requirements**

- All battery energy storage systems must be designed and installed in accordance with all applicable provisions of the New York State Uniform Code. Provide documentation on how this system will meet these requirements.
  - - Most one-to-two family residential systems will be subject to Section R327 (Energy Storage Systems) of the 2020 Residential Code of New York State. . All other systems are subject to Section 1206 (Electrical Energy Storage Systems) of the 2020 Fire Code of New York State.

**PLAN REVIEW**

Permit applications can be submitted to [DEPARTMENT NAME] in person at [ADDRESS] and electronically through: [WEBSITE/EMAIL/FAX CONTACT INFORMATION, IF APPLICABLE].

**FEES**

[PROVIDE CLEAR FEE SCHEDULE]

## DEPARTMENTAL CONTACT INFORMATION

Once all permits to construct the battery energy storage system installation have been issued and the system has been installed, it must be inspected before final approval is granted for the battery energy storage system. On-site inspections can be scheduled by contacting [DEPARTMENT] by telephone at [PHONE NUMBER] or electronically at [WEBSITE OR EMAIL ADDRESS].

Inspection requests received within business hours are typically scheduled for the next business day. If next business day is not available, inspection should happen within a five-day window. [IF MUNICIPALITY ACCEPTS THIRD PARTY INSPECTIONS, INDICATE THIS AND PROVIDE A LIST OF APPROVED INSPECTORS].

In order to receive final approval, the following inspection is required:

[FINAL INSPECTION] The applicant must contact [INSERT CONTACT INFORMATION] when ready for a final inspection. During this inspection, the inspector will review the complete installation to ensure compliance with codes and standards, as well as confirming that the installation matches the records included with the permit application. The applicant must have ready, at the time of inspection, the following materials and make them available to the inspector:

- Copies of as-built drawings and equipment specifications, if different than the materials provided with the application.
- Photographs of key hard to access equipment.

[MUNICIPALITY NAME] has adopted a standardized “Battery Energy Storage System Electrical Checklist”, which can be found here: [WEBSITE ADDRESS].

## DEPARTMENTAL CONTACT INFORMATION

For additional information regarding this permit process, please consult our departmental website at [WEBSITE] or contact [DIVISION NAME] at [PHONE NUMBER].

## Questions?

If you have any questions about the Battery Energy Storage System Model Permit, please email questions to [cleanenergyhelp@nyserda.ny.gov](mailto:cleanenergyhelp@nyserda.ny.gov) or request free technical assistance at [nyserda.ny.gov/Energy-Storage-Guidebook](http://nyserda.ny.gov/Energy-Storage-Guidebook). The NYSERDA team looks forward to partnering with communities across the State.

# Battery Energy Storage System Electrical Checklist

Checklist to assist with field inspections of residential and small commercial battery energy storage systems.



**NYSERDA**

Battery Energy Storage System Guidebook for Local Governments  
NYSERDA 17 Columbia Circle Albany, NY 12203

# Section Contents

1. Electrical Checklist .....25

# Overview

The Electrical Checklist is intended to be utilized as a guideline for field inspections of residential and small commercial battery energy storage systems. It can be used directly by local code enforcement officers or provided to a third-party inspection agency, where applicable.

The Battery Energy Storage System Electrical Checklist is based on the 14th Edition of the National Electric Code (NEC), which is anticipated to be adopted by New York State in 2020. NYSERDA will continue to update the Guidebook as these codes and standards evolve.

The workable version of this document can be found at [nyserdera.ny.gov/Energy-Storage-Guidebook](https://nyserdera.ny.gov/Energy-Storage-Guidebook), Battery Energy Storage System Electrical Checklist tab.

## 1. Electrical Checklist

Applicable Codes: NEC 2017, [add any additional local codes required]

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

### Project Information

Permit Number	
Primary Contractor	
Project Address	
Date	

### Pre-Inspection

	De-energize electrical panels prior to removing the dead-front. All equipment shall be open and ready for inspection
	The approved plans, permit, and installation instructions shall be on site at time of inspection
	Major changes, including revisions, to the installation shall be submitted to the AHJ for review and approval prior to inspection

## Inspection

### General

	Exact match of component product number and rating with plan
	All equipment shall bear the appropriate listing mark of a Nationally Recognized Testing Laboratory where such marking is required as part of the listing, and installed in accordance with its listing (NEC Article 110.3(B))
	Battery energy storage system includes a manual (system description, operating and safety instructions, maintenance requirements, safe battery handling requirements/recommendations)
	A personnel door(s) intended for entrance to and egress from rooms designed as BESS rooms shall open in the direction of egress and shall be equipped with listed panic hardware, (NEC 706.10(D))
	Provide sufficient working spaces and clearances for batteries. Working space shall be measured from the edge of the battery cabinet, racks, or trays, (NEC 480.9, 110.26)
	<p>Spaces about the ESS shall comply with NEC 110.26. Working space shall be measured from the edge of the ESS modules, battery cabinets, racks, or trays, (NEC 706.10(C))</p> <ul style="list-style-type: none"> <li>• For battery racks, there shall be a minimum clearance of 1 inch between a cell container and any wall or structure on the side not requiring access for maintenance.</li> <li>• ESS modules, battery cabinets, racks, or trays shall be permitted to contact adjacent walls or structures, provided that the battery shelf has a free air space for not less than 90% of its length.</li> <li>• Pre-engineered and self-contained ESSs shall be permitted to have working space between components within the system in accordance with the manufacturer's recommendations and listing of the system.</li> </ul>

### Equipment

	Flexible Battery DC conductors are listed as hard service use and/or moisture resistant, (NEC 690.74, 706.32)
	Fine stranded flexible cables (if used) terminated in accordance with NEC 110.14, (NEC 110.14, 690.74, 706.32)
	Ungrounded conductor is not marked using white, grey, or white striped conductors to avoid confusion with grounded conductor markings, (NEC 200.7)
	Electrochemically dissimilar metals are not in direct physical contact, (NEC 110.14)
	All connections shall be secure, (NEC 110.14, 706.31)
	All metallic raceways and equipment shall be bonded and electrically continuous, (NEC 110.3(B), 250.8)
	Unused opening shall be close with protection equivalent to the wall of enclosure, (NEC 110.3(B), 408.7)
	The selected wiring methods are appropriate for the location and installed in accordance with their intended use, (NEC 310, 706)
	All live parts of batteries must be guarded regardless of voltage or battery type, (NEC 706.10(B))
	Batteries' live parts shall be guarded in accordance with (NEC 110.27, 480.10(B))
	Verify that the attachment of the battery storage unit to the wall or floor is per the approved plans. If the wall or floor construction differs from the approved plans, a revision is required prior to inspection

### Grounding

	Any conductive battery racks, cases or trays must be connected to an equipment grounding conductor. (NEC 250.110)
	Equipment grounding conductor is properly identified as either bare, green, or green with continuous yellow stripe(s), (NEC 250.119)
	If there is no existing AC grounding electrode, the ESS contractor shall install (2) ground rods at the main electrical service. If there is only (1) ground rod, a second one shall be installed. Ground rods shall be a minimum of 6' apart, (NEC Exhibit 250.25, Article 250.53, 706)

## Main Electric Service

	Circuit breakers shall be of the same manufacturer as the main service panel, (NEC 110.3)
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## Ventilation

	Provide adequate ventilation for batteries per manufacturer's requirements. (NEC 706.10(A))
	Batteries/enclosures contain ventilation equipment to prevent excessive accumulation of gas pressure and/or gas ignition, (NEC 706.10)

## Connections and Terminations

	Cell terminations have measures taken to prevent corrosion
	Electrical connections do not put mechanical strain on battery terminals, (NEC 706.31, 110.14(A))
	Overcurrent protection of ungrounded conductors shall have overcurrent protection device(s) located as close as practicable to the battery terminals in an unclassified location, (NEC 480.5, 706.7)
	Battery circuit and equipment shall be protected by overcurrent protective devices as close as practicable to the storage battery terminals in accordance with the requirements of NEC Article 240, (NEC 240.21(H), 705.65(A))
	Unless the short-circuit currents from all sources do not exceed the ampacity of the conductors, storage battery inverters shall be protected by overcurrent protective devices from all other sources, (NEC 705.65(A))
	A listed current-limiting overcurrent protective device shall be installed adjacent to the ESS for each dc output circuit, (NEC 706.21(C))
	In an ac-coupled system, the plug-in type circuit breaker connected to the output of the storage battery or multimode inverter is required to be secured, (NEC 408.36(D), 710.15(E))
	Storage battery, multimode, and utility-interactive inverter output circuit breakers that are marked "Line" and "Load" are not permitted to be back-fed, (NEC 710.15(E), 110.3(B), 705.12(B)(4))
	Single 120-volt inverter in ac coupled systems should not supply back-up loads containing multiwire branch circuit or any 240 volt outlets. Such action can overload the common neutral in such a wiring method, (NEC 710.15(C))

## Monitoring and Charge Control

	Charge controllers shall be compatible with the battery or ESS manufacturer's electrical ratings and charging specifications, (NEC110.3(B))
	Charge controller is properly installed to prevent overcharging or damaging batteries, (NEC 690.72, 706.23)
	Diversionary charge controllers with utility-interactive and multimode inverters shall have a second independent controller to prevent battery overcharge in the event the diversion loads are unavailable or the diversion charge controller fails, (NEC 706.23(B)(3)(b))

## Disconnecting Means

	A disconnecting means is provided for all ungrounded conductors derived from a dc stationary battery system with a voltage of over 60 volts dc, (NEC 480.7)
	A disconnecting means shall be provided for all ungrounded conductors derived from an ESS. A disconnecting means shall be readily accessible and located within sight of the ESS, (NEC 706.7(A))
	Battery circuits subject to field servicing where exceeding 240 volts nominal between conductors or to ground, shall have provisions to disconnect the series-connected strings into segments not exceeding 240 volts nominal for maintenance by qualified persons. Non-load-break bolted, or plug-in disconnects shall be permitted, (NEC 706.30(B))
	ESS exceeding 100 volts between conductors or to ground shall have a disconnecting means, accessible only to qualified persons, that disconnects ungrounded and grounded circuit conductor(s) in the electrical storage system for maintenance. This disconnecting means shall not disconnect the grounded circuit conductor(s) for the remainder of any other electrical system. A non-load-break-rated switch shall be permitted to be used as a disconnecting means, (NEC 706.30(C))
	Where battery energy storage system input and output terminals are more than 5ft from the connected equipment, or where these terminals pass through a wall or partition must comply with all of NEC 706.7(E) (1) A disconnecting means shall be provided at the energy storage system end of the circuit. Fused disconnecting means or circuit breakers shall be permitted to be used. (2) A second disconnecting means located at the connected equipment shall be installed where the disconnecting means required by 706.7(E)(1) is not within sight of the connected equipment. (3) Where fused disconnecting means are used, the line terminals of the disconnecting means shall be connected toward the energy storage system terminals. (4) Disconnecting means shall be permitted to be installed in energy storage system enclosures where explosive atmospheres can exist if listed for hazardous locations. (5) Where the disconnecting means in (1) is not within sight of the disconnecting means in (2), placards or directories shall be installed at the locations of all disconnecting means indicating the location of all other disconnecting means. (NEC 706.7(E))
	Where a disconnecting means, located in accordance with NEC 480.7(A) (out of sight of the battery storage system), is provided with remote controls to activate the disconnecting means and the controls for the disconnecting means are not located within sight of the stationary battery system, the disconnecting means shall be capable of being locked in the open position, (NEC 480.7(B))
	The equipment grounding lug shall be as specified by the manufacturer, (NEC 110.3(B))
	Remove any insulating finish, such as paint, under the equipment grounding lug prior to installation (NEC 250.8, 250.12)
	Maximum height requirements for disconnects applies to integrated disconnect (e.g., Tesla PowerWalls or similar applications)

## Interconnection

	The interconnection methods comply with NEC Article 705.12 (if connected to other energy sources)
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## Signage

<p>The signage shall be in compliance with ANSI Z535 and shall include the following information</p> <ol style="list-style-type: none"> <li>1. Labeled “Energy Storage Systems” with symbol of lightning bolt in a triangle</li> <li>2. Type of technology associated with the ESS</li> <li>3. Special hazards associated</li> <li>4. Type of suppression system installed in the area of the ESS</li> <li>5. Emergency contact information</li> </ol>
<p>A permanent plaque or directory denoting the location of all electric power source disconnecting means on or in the premises shall be installed at each service equipment location and at the location(s) of the system disconnect(s) for all electric power production sources capable of being interconnected. The marking shall comply with NEC 110.21(B) (NEC 706.11)</p>
<p>Equipment containing overcurrent devices in circuits supplying power to a busbar or conductors supplied from multiple sources shall be marked to indicate the presence of all sources. (NEC 705.12(B)(3))</p>
<p>PV system output circuit conductors shall be marked to indicate the polarity where connected to battery energy storage systems. (NEC 690.55)</p>
<p>DC system conductors of 4 AWG or larger shall be identified using colored marking tape, (NEC 210.5(C)(2))</p>
<p>Where controls to activate the disconnecting means of a battery are not located within sight of a stationary battery system, the location of the controls shall be field marked on the disconnecting means. (NEC 480.7(B))</p>
<p>Where controls to activate the disconnecting means of an ESS are not located within sight of the system, the disconnecting means shall be capable of being locked in the open position, in accordance with 110.25, and the location of the controls shall be field marked on the disconnecting means. (NEC 706.7(B))</p>
<p>Where the sum of the ampere ratings of all overcurrent devices on panelboards, both load and supply devices, excluding the rating of the overcurrent device protecting the busbar, shall not exceed the ampacity of the busbar. The rating of the overcurrent device protecting the busbar shall not exceed the rating of the busbar. Permanent warning labels shall be applied to distribution equipment displaying the following or equivalent wording: (NEC 705.12(B)(2)(3)(c)):</p> <p style="text-align: center;"><b>WARNING: THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR</b></p>
<p>Where two sources, one a primary power source and the other another power source, are located at opposite ends of a busbar that contains loads, the sum of 125 percent of the power source(s) output circuit current and the rating of the overcurrent device protecting the busbar shall not exceed 120 percent of the ampacity of the busbar. The busbar shall be sized for the loads connected in accordance with Article 220. A permanent warning label shall be applied to the distribution equipment adjacent to the back-fed breaker from the power source that displays the following or equivalent wording: (NEC 705.12(B)(2)(3)(b)):</p> <p style="text-align: center;"><b>WARNING: INVERTER OUTPUT CONNECTION; DO NOT RELOCATE THIS OVERCURRENT DEVICE.</b></p>
<p>All battery and battery management equipment and associated switchgear are marked and labeled according to all applicable codes including arc flash incident calculations for the safety of operation and maintenance personnel required by the National Electrical Code and OSHA: (NEC 110.16)</p>
<p>If a battery dc disconnecting means is not provided at the batteries, the disconnecting means shall be legibly marked in the field. The marking shall be of sufficient durability to withstand the environment involved and shall include the following (NEC 480.7(D)):</p> <ul style="list-style-type: none"> <li>• Nominal battery voltage</li> <li>• Maximum available short-circuit current derived from the stationary battery system</li> <li>• Date the calculation was performed for the value above</li> <li>• The battery disconnecting means shall be marked in accordance with 110.16</li> </ul>

# Questions?

If you have any questions about the Battery Energy Storage System Electrical Checklist, please email questions to [cleanenergyhelp@nyserda.ny.gov](mailto:cleanenergyhelp@nyserda.ny.gov) or request free technical assistance at [nyserda.ny.gov/Energy-Storage-Guidebook](https://nyserda.ny.gov/Energy-Storage-Guidebook). The NYSERDA team looks forward to partnering with communities across the State.