

# Basics of Solar: What Is It & How Does It Operate?

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# Agenda

- + Introduction
- + Solar 101
- + Solar Viability
- + Solar Economics
- + Community Solar
- + Case Studies



# What is the NYC Accelerator?

- ↗ A City program to help boost building performance, increase energy savings, control costs, meet local law compliance, and reduce carbon emissions across NYC buildings
- ↗ This program is here to provide free technical guidance to help the market transform how our buildings operate and are built
- ↗ The NYC Accelerator team identifies building upgrade projects to help meet emissions limits established under the Climate Mobilization Act
- ↗ The NYC Accelerator also provides no-cost building operator trainings and supports green workforce development

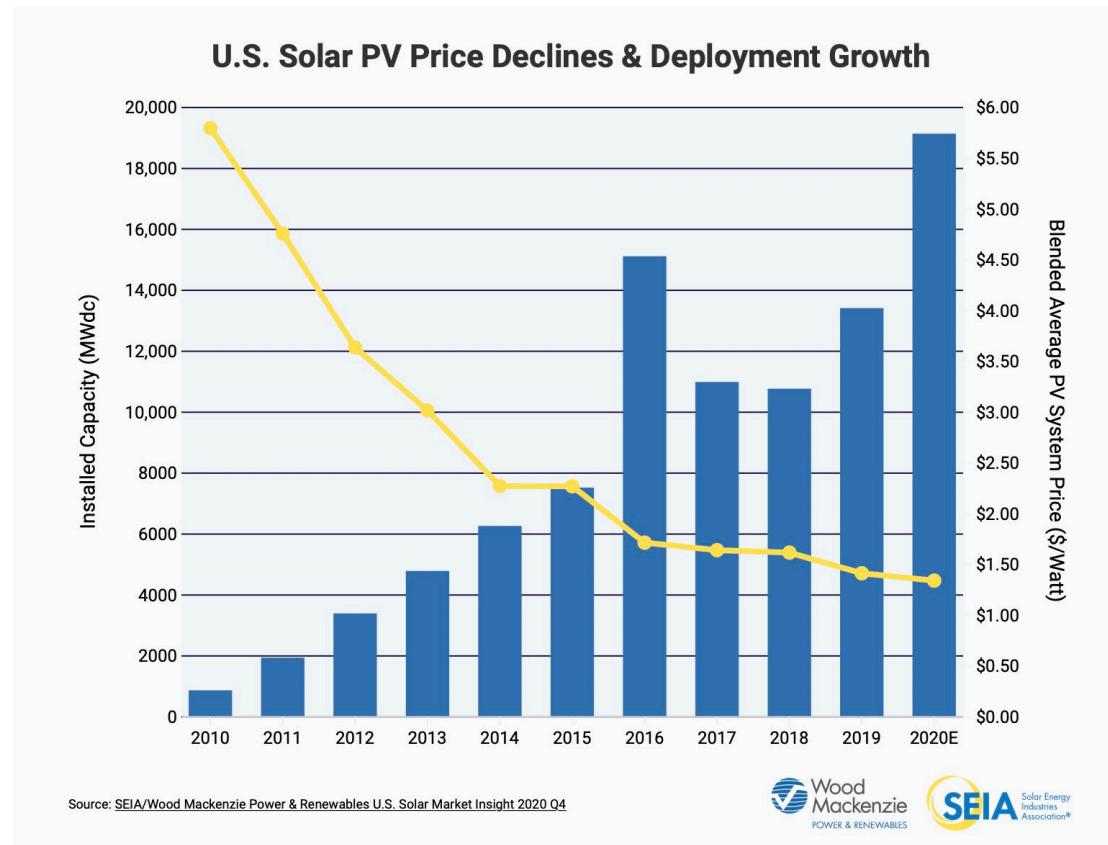


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# The Status of Solar in NYC

Solar costs have declined dramatically in recent decades.

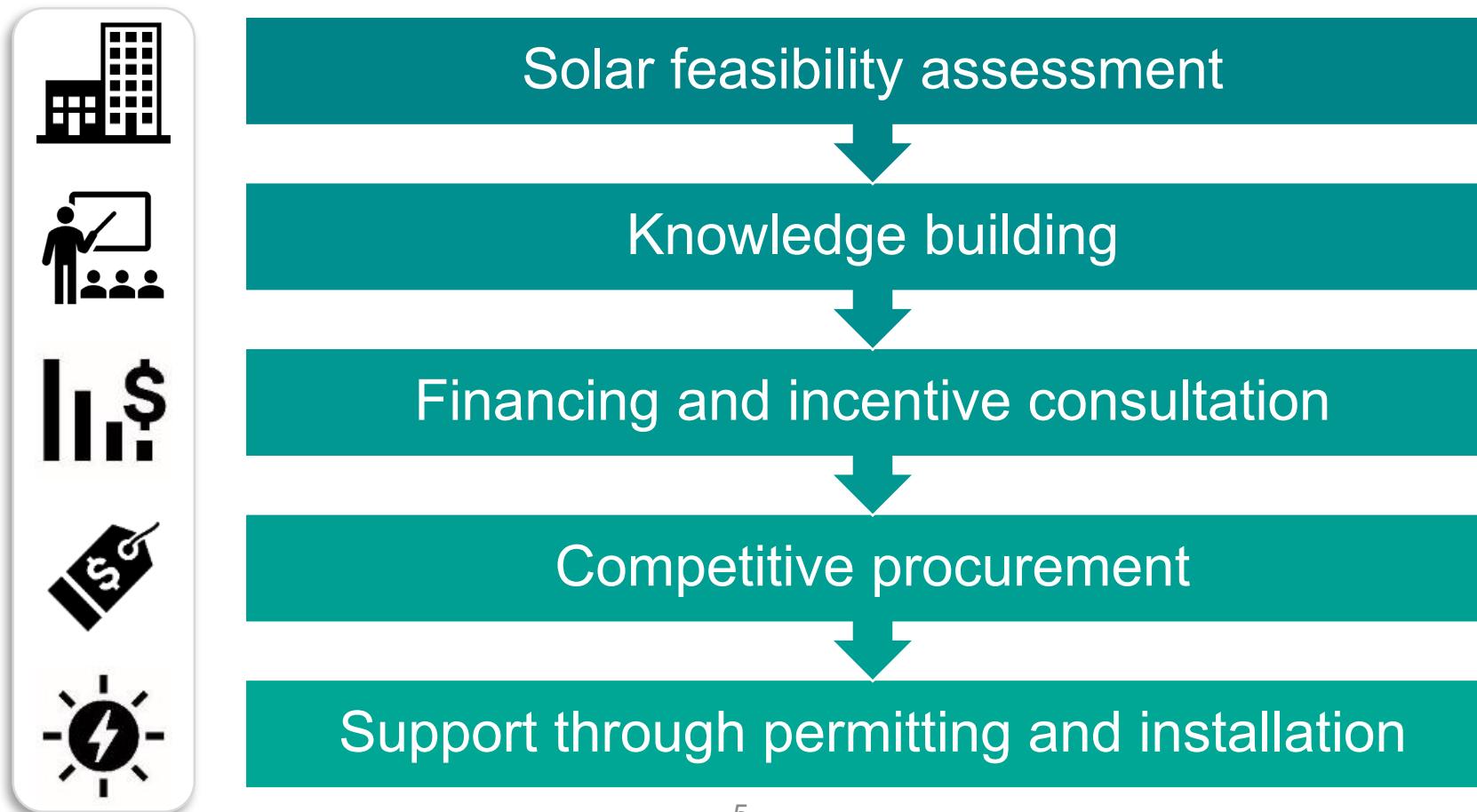


...But New Yorkers still face barriers

- + Construction red tape
- + System complexity for multi-family buildings
- + Dense urban environment
- + Additional complexity for affordable housing

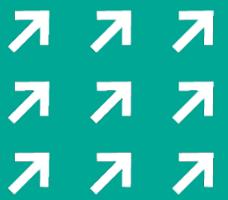
# NYC Accelerator Solar Program Model

We seek to make solar accessible to everyone, particularly low income communities and affordable housing. We offer technical assistance to make solar simple and affordable, including:



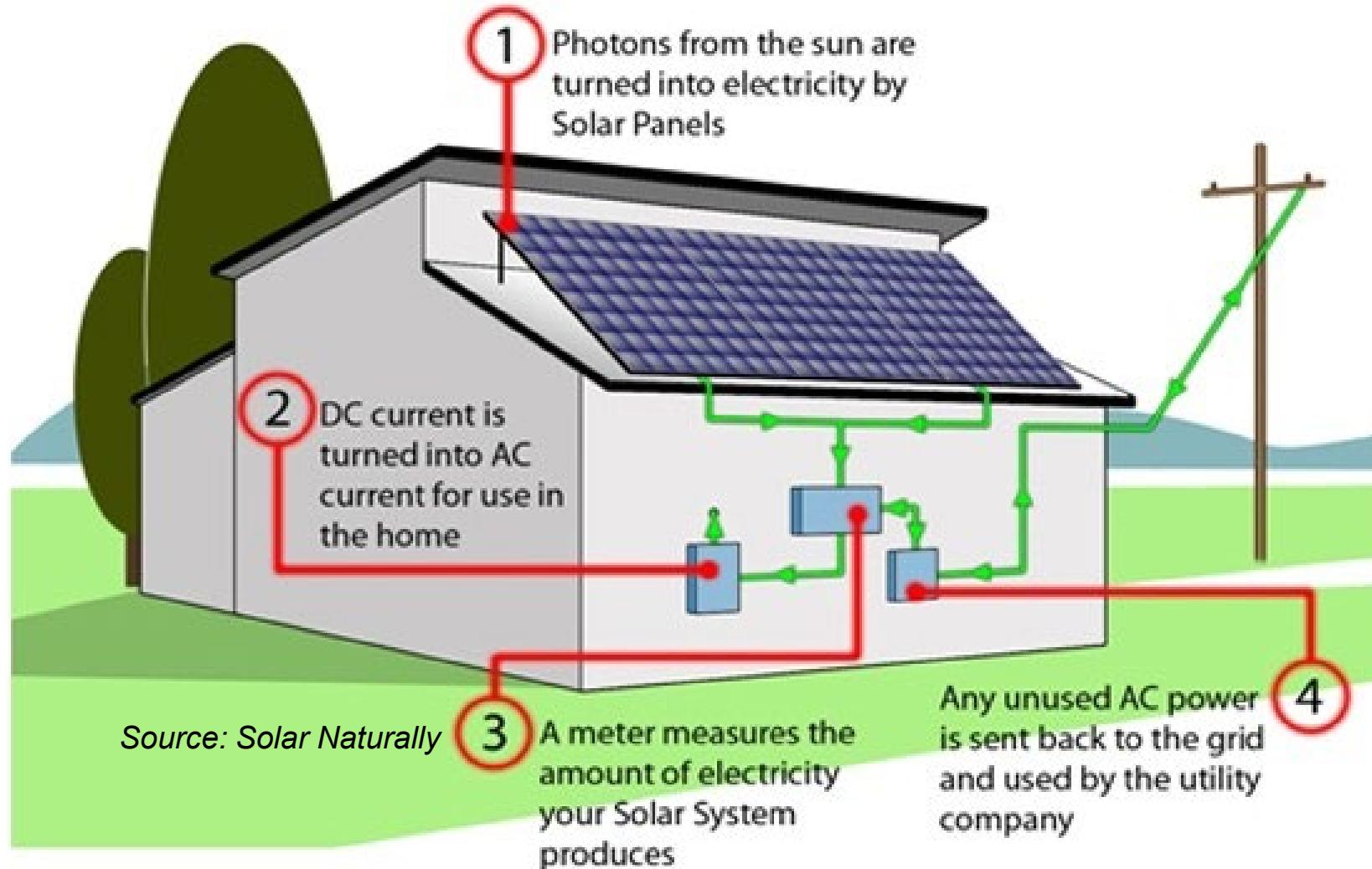
# The Importance of Solar

- + Solar is key to any climate solution
- + Buildings account for ~70% of NYC greenhouse gas emissions
- + NYC's Climate Mobilization Act put a price on carbon and requires solar on new construction projects
- + Solar benefits NYC's old, constrained grid
- + Solar savings reduce energy burden for low-income New Yorkers
- + More solar = more green jobs in the city



# SOLAR 101

# Introduction to Solar



# Solar Panels

- + 25+ year operating life
  - Best to install on a new roof (0-5 years)
- + Low Maintenance
- + Requires direct sunlight
  - Avoid shading from trees or other buildings
- + Grid-connected
  - Does not provide power in a blackout unless batteries are added



# Types of Solar Installations



## Ballasted Array:

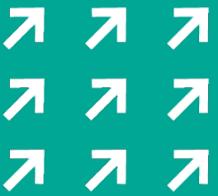
- Low profile
- No roof penetrations
- Cheaper and easier

## Planar Array:

- Mechanically integrated
- More solar production
- Best for space-constrained roofs

## Canopy Array:

- Raised 9' high
- Can cover entire roof area with room below
- Most expensive option



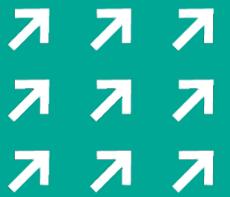
# SOLAR VIABILITY

# Solar Viability





# SOLAR ECONOMICS



# Solar Energy Credits



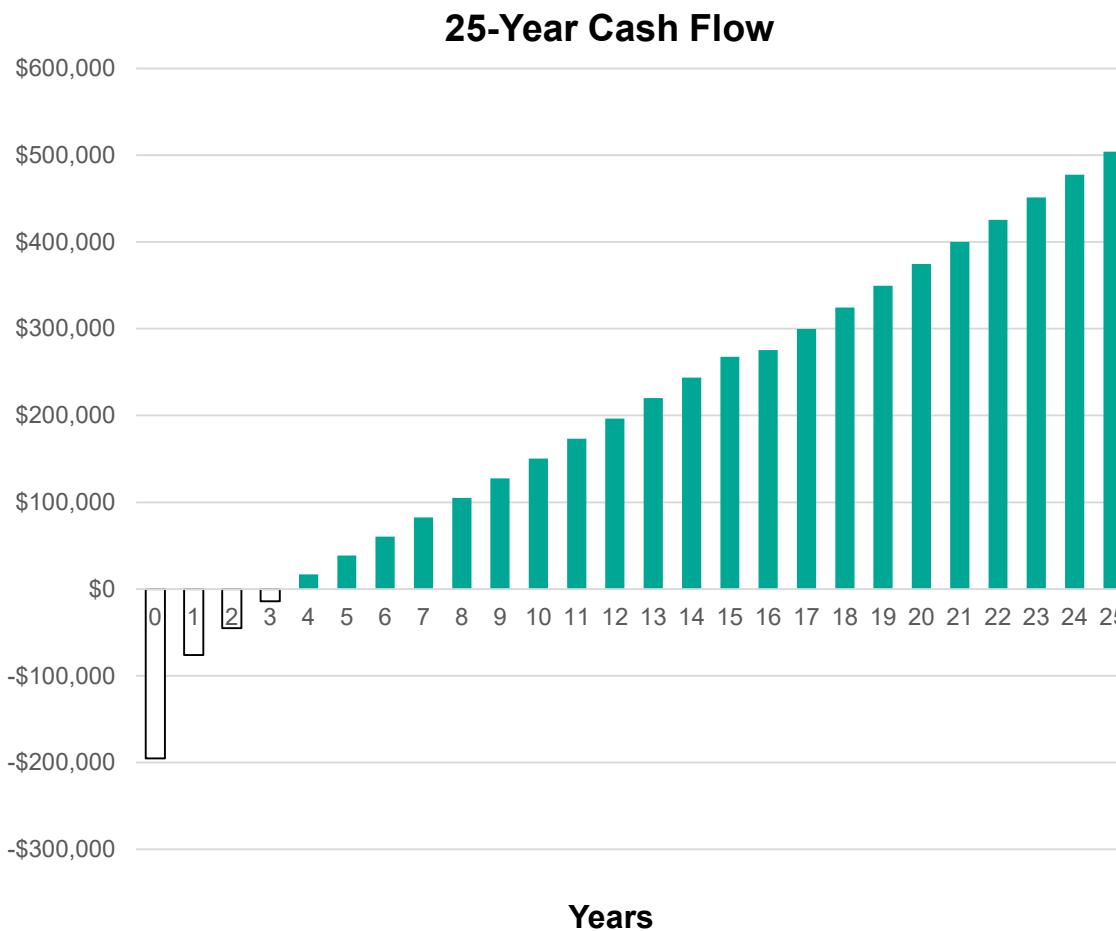
1. Solar power offsets common area usage (lights, laundry room, elevators, etc.)

2. Solar power is split between residential electric bills with Community Solar (only available for some buildings)

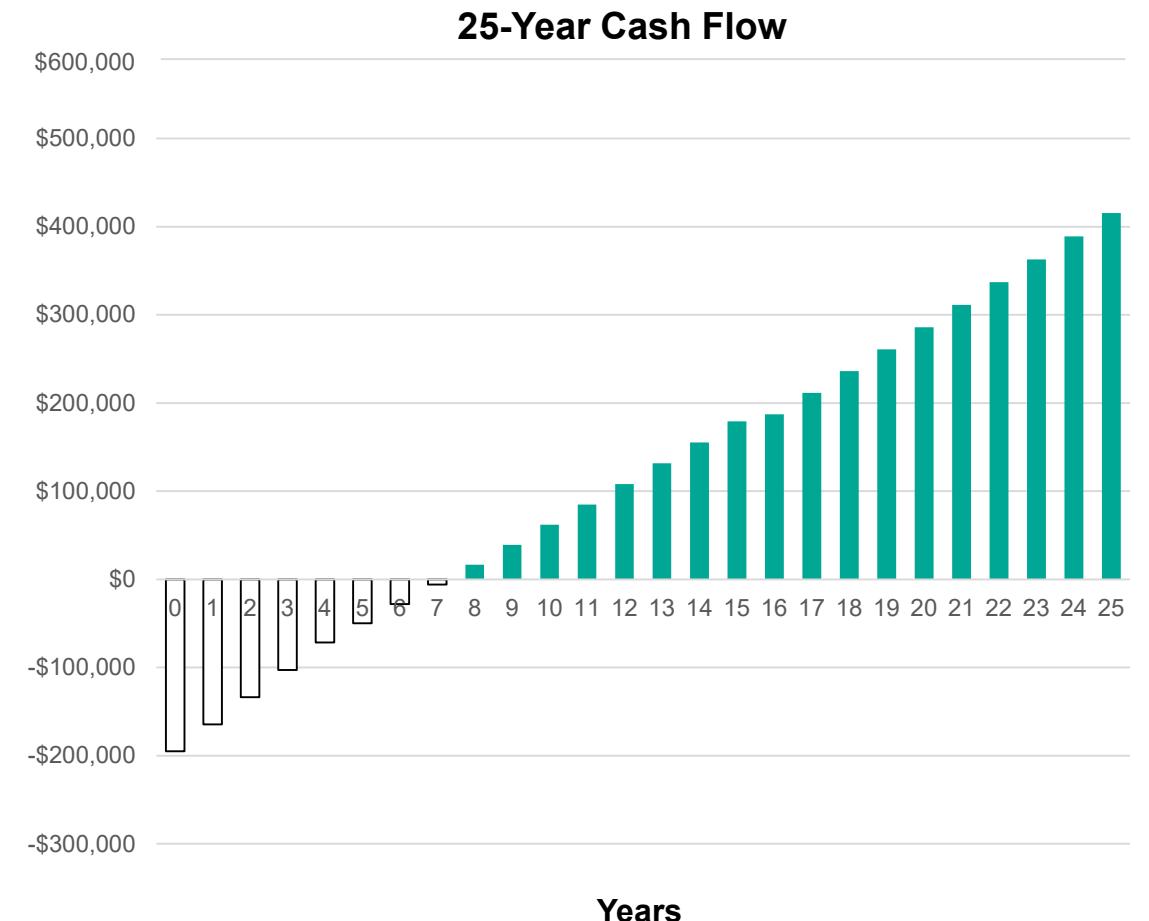


# Solar Savings

## Including tax credits

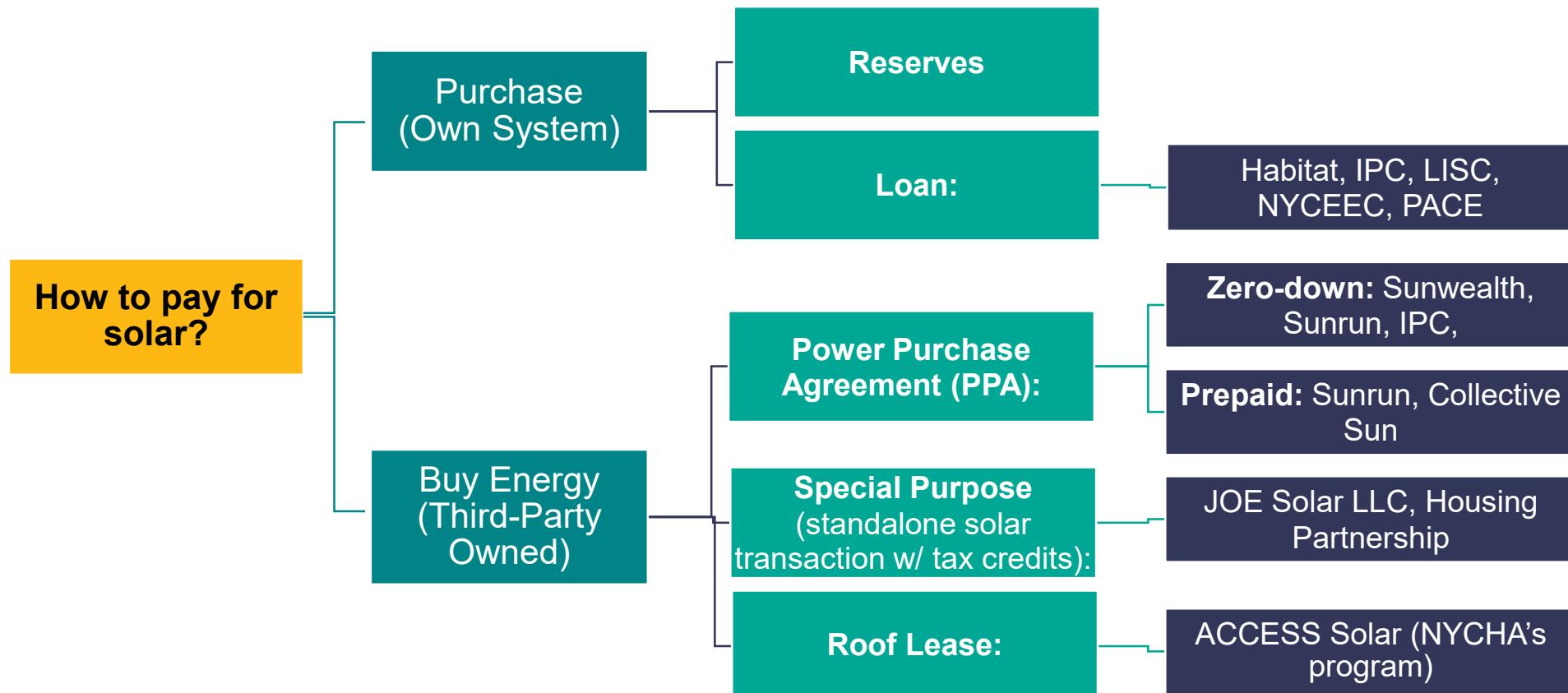


## Excluding tax credits



# Solar Financing & 3<sup>rd</sup> Party Ownership

With solar loans, community solar, and Power Purchase Agreements (PPAs), solar is possible with little or no upfront cost.



# Solar Incentive Eligibility

In New York City, solar incentives typically offset 50-80% of the total cost of a solar energy system, depending on the type of building owner

Building Type	NYSERDA NY-SUN Incentive	Federal Tax Credit	State Tax Credit	Accelerated Depreciation	Property Tax Abatement
 Owner-Occupied Co-op/Condo	\$1.00/Watt-DC for affordable housing, payable directly to the solar installer	Likely distributed to shareholders	Must be distributed to shareholders	Only available to businesses	Only eligible if taxes are owed, not compatible with some other abatements
 For-Profit Rental	\$1.00/Watt-DC for affordable housing, payable directly to the solar installer	Commercial Tax Credit can be taken	N/A (homeowners only)	Available, pending owners' income tax liability	Only eligible if taxes are owed, not compatible with some other abatements
 Non-Profit Rental	\$1.00/Watt-DC for affordable housing, payable directly to the solar installer	Tax Credit can only be monetized if project has LIHTC investor	N/A (homeowners only)	No tax liability	No tax liability

Federal Investment Tax Credit is 26% in 2021, 22% in 2023, 10% in 2024 (pending changes to federal policy)

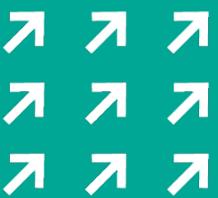
# Solar Financing – Buy the Energy

## Power Purchase Agreement (PPA)

- The solar company owns the system and you pay for the electricity generated at a rate lower than your Con Ed rate
- Little to no upfront cost
- The solar company passes on the benefits of the tax credit
- The solar company is responsible for the system for 20-25 years
- You can buy out the system for a reduced rate after 6 years

## Prepaid Power Purchase Agreement (PPA)

- Purchase the solar energy system at ~12% discount
- Tax equity investor owns the system for 7 or 20 years, then ownership flips
- Ideal for nonprofits who want to purchase but cannot claim tax credits

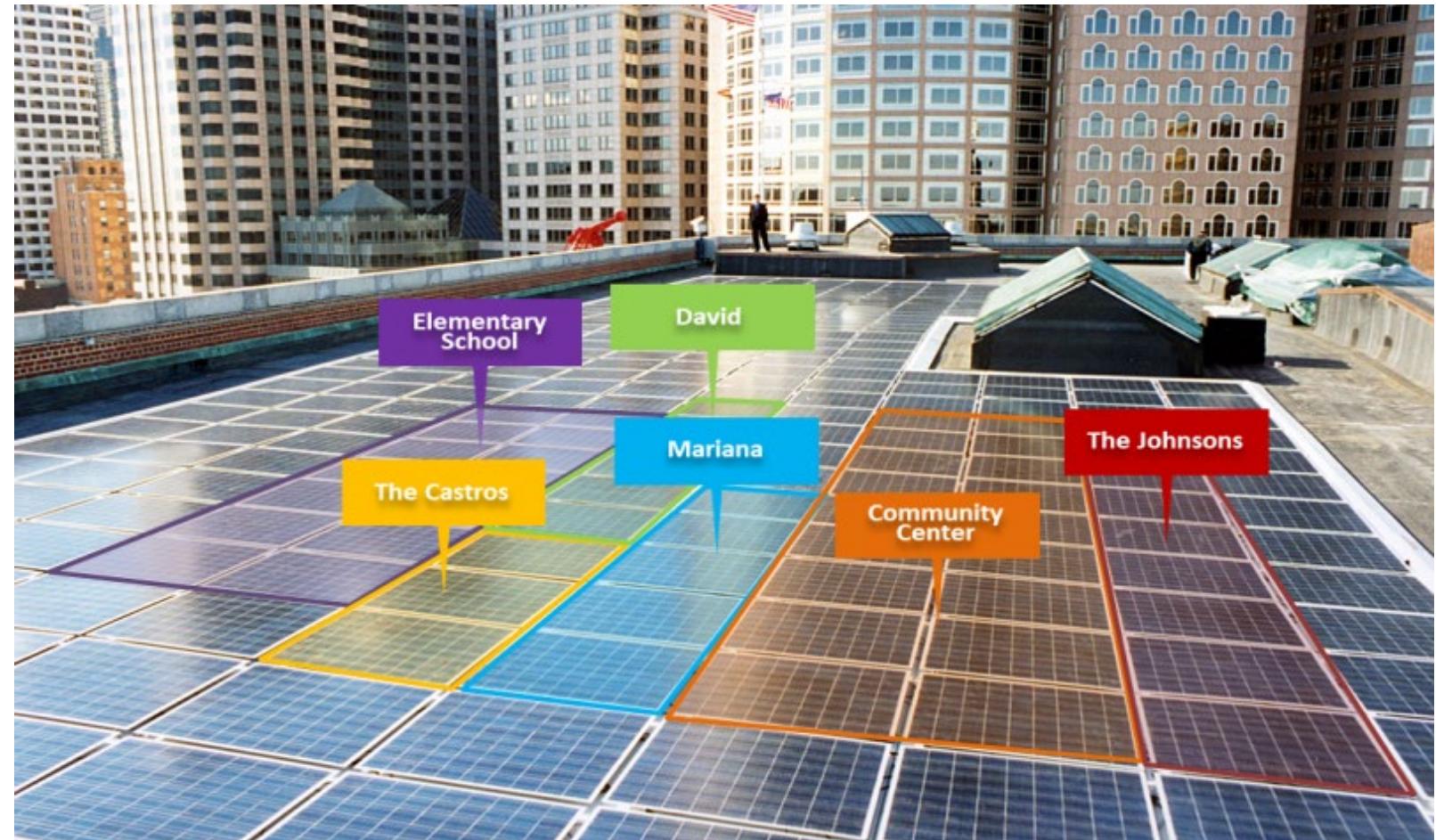


# COMMUNITY SOLAR

# What is Community Solar ?

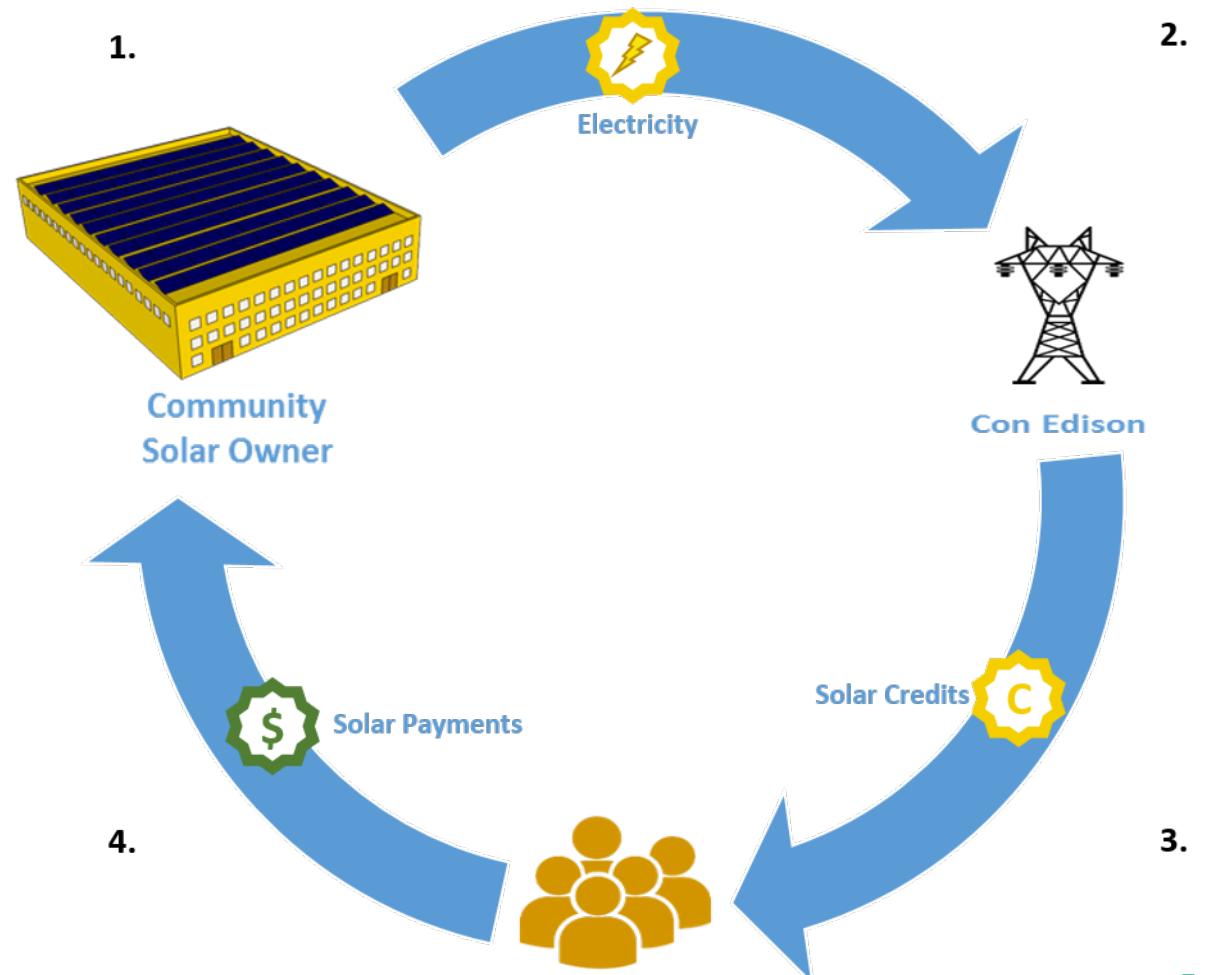
A form of solar energy that allows individual households to share one large solar energy system and reduce their energy bill through solar credits.

- + Free to sign up
- + 12 month term
- + Auto-renewal
- + Moves with you if you move within NYC
- + No cancellation fee



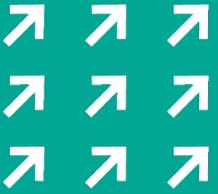
# How Community Solar Works

1. Solar is installed on a large roof somewhere in NYC and all of it is exported to the utility
2. Con Edison allocates solar credits to the list of community solar subscribers
3. Subscribers receive solar credits on their electric bill
4. Subscribers pay the solar provider for the credits received at a guaranteed 10% discount

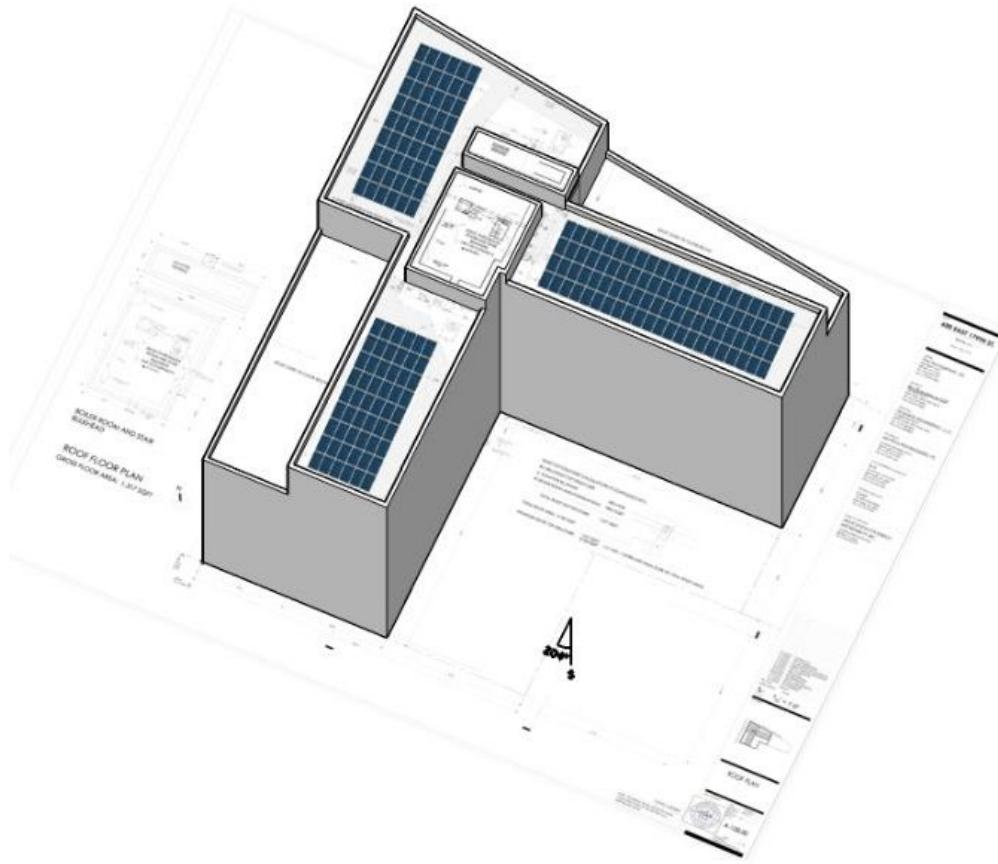




## CASE STUDIES



# Case Study: Arthur Avenue Apartments



<b>Location</b>	Bronx, NY
<b>Project Type</b>	New Construction, 4% Low Income Housing Tax Credits (LIHTC)
<b>Developer</b>	Foxy Management
<b>General Contractor</b>	LendLease
<b>Solar Installer</b>	Accord Power
<b>Prevailing Wage?</b>	Yes
<b>Solar System Size</b>	68.64 kW-DC
<b>Price (\$/Watt-DC)</b>	\$4.15
<b>Payback Period</b>	7 years
<b>Lifetime Net Savings</b>	\$171,000
<b>Installation Type</b>	Canopy
<b>Completion</b>	Summer 2020

# Case Study: 15 Stratford Road

<b>Location</b>	Brooklyn, NY
<b>Building Type</b>	Mid-size co-op
<b>Solar Installer</b>	Solar Energy Systems
<b>Payment Method</b>	Cash
<b>Solar System Size</b>	34.6 kW-DC
<b>Upfront Cost</b>	\$80,500
<b>Payback Period</b>	7 years
<b>Annual savings/profits</b>	\$5,436
<b>Lifetime Net Savings</b>	\$190,000
<b>Installation Method</b>	Dual Tilt Ballasted
<ul style="list-style-type: none"><li>Solar energy is offsetting energy costs for common area as well as a portion of tenant's bills</li></ul>	



# Diego Beekman MHA HDFC



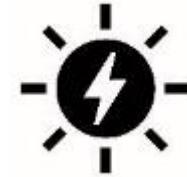
<b>Location</b>	Mott Haven, BX
<b>Size</b>	589.5 kW-DC
<b>Number of Buildings</b>	17
<b>Payback Period</b>	6 years
<b>Lifetime Net Savings</b>	\$3.3 MM
<b>Installation Method</b>	Ballasted
<b>Selected Installer</b>	Harvest Power
<b>Expected Completion</b>	Fall 2022
<ul style="list-style-type: none"><li>Utilizing community solar to offset EL8 master metered accounts</li></ul>	

# Case Study: Offsite Community Solar

- + Aggregated portfolio of 10 affordable housing providers
- + Large buildings will use Community Solar to distribute energy credits to non-viable buildings in the portfolio
- + With Community Solar:
  - \$101,580 year 1 savings
  - \$885,420 lifetime net savings
- + Increased benefits are shared among nearly 100 buildings
- + Purchase the energy produced by the system at ~20% discount (combined with a loan)

Compare to without Community Solar:  
\$53,100 year 1 savings  
\$384,120 lifetime net savings





**Questions?  
Thank You!**

