



BASILICA HUDSON

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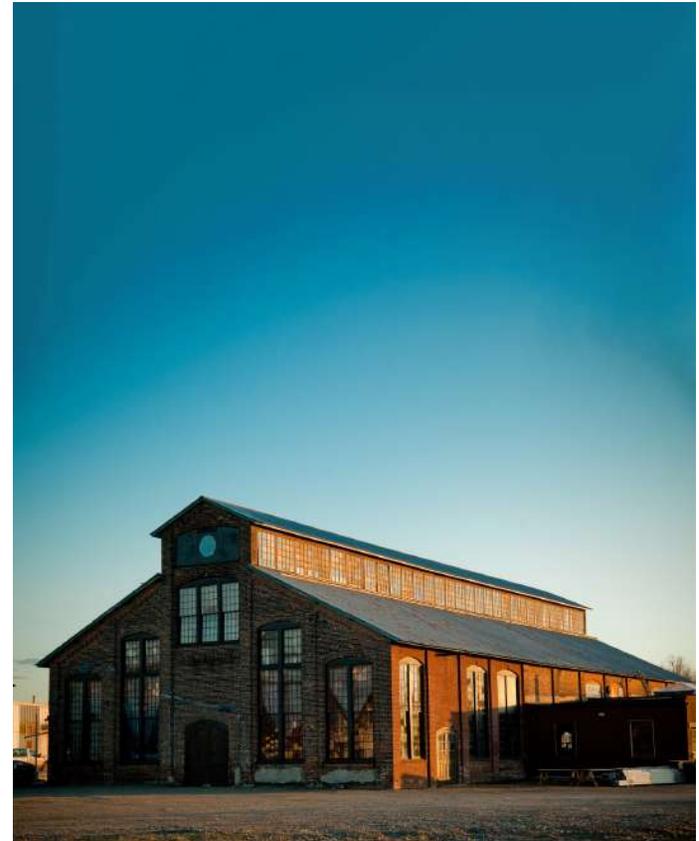
# NET ZERO CAMPUS

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NYSERDA 2019

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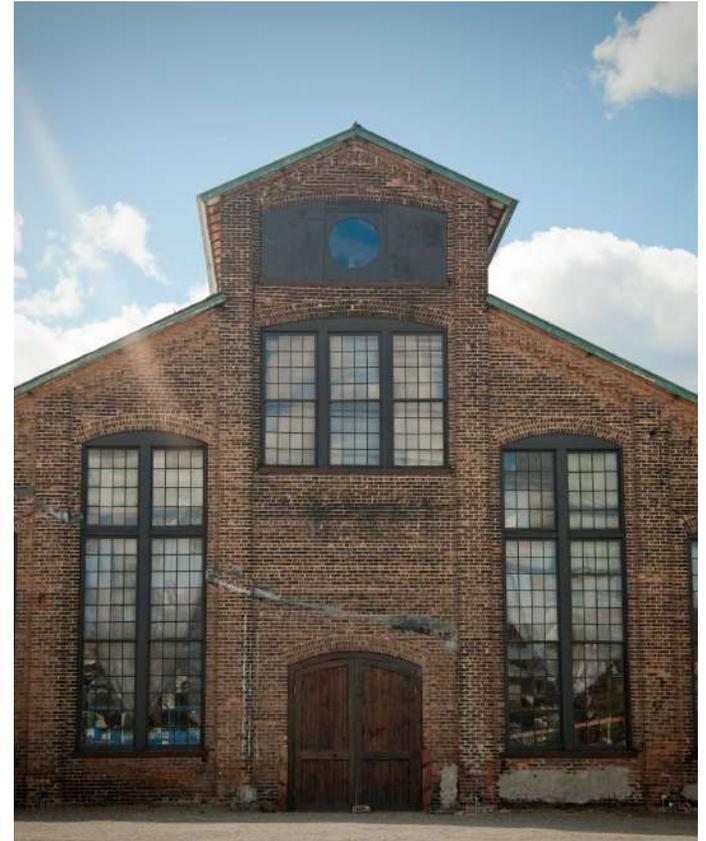


# ABOUT BASILICA HUDSON

**Non-profit multidisciplinary arts center supporting arts, culture, and sustainable community.**

Basilica Hudson is a non-profit multidisciplinary arts center in Hudson, NY, supporting the creation, production and presentation of arts and culture, while fostering sustainable community. Founded in 2010 by musician Melissa Auf der Maur and filmmaker Tony Stone, Basilica Hudson makes its home in a spectacular solar-powered, reclaimed 1880s industrial factory on the waterfront of the historic City of Hudson.

Drawing inspiration from its location — from explorer past, to the Hudson River School painters, through the industrial revolution, and now finding new resurgence here in art, agriculture, and sustainability — Basilica Hudson celebrates local community and culture, while bringing international voices, work, and ideas to the region.





*"A cavernous, cathedral-like building that feels simultaneously historical and futuristic, an emblem of the area's industrial past juxtaposed against an ancient backdrop of mountains, river and forest."*

THE GUARDIAN, 2014



*"Basilica Hudson is rapidly emerging as a truly cutting-edge Hudson Valley performing arts venue."*

ALMANAC WEEKLY, 2014



*"Getting there is a pleasure, and being there is a pleasure."*

NEW YORK TIMES, 2013

# PROJECT SCOPE

Basilica Hudson serves more than 40,000 visitors each season through cultural, community and private events, in a reclaimed, solar-powered 1880s industrial space in the heart of the DRI BRIDGE District. Currently a seasonal space, Basilica plans to winterize the two buildings (17,000 and 4,300 square feet respectively) on the campus to create year-round space for expanded cultural and community programs, and workforce training, and is committed to achieving net zero energy performance as part of the upgrade. A fully green Basilica will also offer opportunities to educate visitors, residents and peers on the potential of energy efficiency - inspiring attendees of cultural programs or private events to think more broadly about energy and climate.

The Basilica Hudson building is used by non-profit Basilica Arts for cultural programs (music concerts + festivals, film screenings, art exhibitions, community marketplaces, climate-focused programs-panel discussions and marketplace events, literary programs, workforce training programs) and by landlord Basilica Industries for private event rentals.

**To operate year round and achieve NetZero energy performance with zero fossil fuels used, Basilica will combine extensive weatherization of the buildings with new renewable energy systems.**

- The weatherization will completely seal the thermal enclosure and allow efficient energy use throughout the spaces [currently, only 15% (4000 sq ft) of the total 21,300 sq ft of interior space is conditioned]
- For the energy system, Basilica would install two new solar arrays (30 kW and 70 kW), to work with an existing 50 kW solar array. The additional 100KW solar system would create enough energy to power a new Mitsubishi Hyper Heat Y-Series heat pump system.
- The new HVAC system would replace the current gas heaters and work in tandem with four M Series split systems currently installed across the two buildings, and would expand areas in the buildings where heating or cooling will be available.
- A battery storage system is also planned, to support peak load mitigation (based on 8760 hour energy use; site is in the National Grid Hudson LSRV zone).
- Hot water needs across the whole campus will be served with heat pump hot water heaters made by Stiebol Eltron or Sanden; commercial induction stoves will be installed in the kitchen (replacing propane currently used).
- Additional car charging stations would also be added (four Level 2 Chargers).



# PROJECT SCOPE

## CONTINUED

Critical weatherization renovations to seal the envelope (insulation, roof, windows and doors) will allow year round, efficient HVAC usage and energy performance. The spectacular 1880s building will require significant improvements to enhance the thermal enclosure:

- Extreme Weatherization of Main Building windows (38 windows, majority of these 12 foot in height)
- Extensive pointing and masonry work to reduce air penetrations.
- Comprehensive insulation of roof areas
- Comprehensive winterization of all doors (14 total)

**With these additions, 100% of building spaces would be used for full-time, year round use Jan – Dec, using 100% solar and 0% fossil fuels, from grid or propane, to serve total building energy needs.** Through this project, Basilica will be adding more power to its systems, complementing the existing 50 kW solar array, because more is needed: the existing 50 kW solar array serves 70% of total energy usage of the total space, which is currently seasonal; expanding to year-round operations, providing heating and cooling in all spaces, and achieving NetZero performance for all operations will require an expanded system.



# PROJECT SCOPE

CONTINUED

Additionally, and critically, the owners have a **significant proven track record of success with mindful historical, green renovations**. First, making the majestic Basilica Hudson building publicly accessible (the building had been abandoned and was in great disrepair when purchased in 2010; work included adding all plumbing and electricity, repairing windows and roof, etc. And in addition: the owners have just completed a comprehensive historical rehabilitation and green renovation of a 20,000 sq ft 1903 schoolhouse, adjacent to the Basilica site. The River House Project (CFA #75420) reclaimed the abandoned space to create professional workspace for creative enterprises, and the top to bottom renovation created another 100% net zero space.

**Already primarily solar powered, with these improvements, Basilica can make its spectacular 1880s factory building into a model of energy efficiency and a 21st century icon: a solar-powered remnant of a fossil-fueled industrial past. With the addition of new solar arrays plus a heat pump HVAC system and a battery storage system, Basilica can achieve net zero energy performance and power all of its programs year round with just the magnificent sun.**



# REPLICABLE MODEL

A 1880s factory brought back online to serve 40,000 visitors per year, powered solely by the sun, can be a model for renewable energy and sustainable renovation projects throughout New York State, and beyond. The vision for these renovations to create a year-round facility with net zero energy performance will be a cohesive 21st century reclaiming of an 1880s industrial factory that will serve as a model for renewable energy and mindful historic rehabilitation, furthering Basilica Hudson's commitment to fostering sustainable community and environment while being a gateway to Hudson and the region.

With former industrial communities struggling to find sustainable models for revitalization, and with urgent climate issues facing every community, New York State and beyond, the Basilica model -- Solar plus air to air Heat Pump plus Battery Storage -- is a replicable model. And completed in a former industrial space provides inspiration about how such older buildings can be brought back on line, for community or for-profit use.

Hudson's revitalization has been significant, and serves as a beacon to the region. And Basilica can be an industrial relic of a fossil-fuel age turned beacon of green and sustainable energy.



# PROJECT TIMELINE

If funding is awarded, work would begin immediately following the December 2019 award. Initial designs are in place, and formal engineering designs would be created. Planning with SunCommon and other vendors for renewable energy system is in process and a trusted construction crew is available, so construction work could begin quickly.

Construction will include masonry, insulating, door and window weatherization, HVAC installation, wiring and other interior work to upgrade the space, as well as installation of new equipment as part of the renewable systems.

Because of scheduled programming during the 2020 and 2021 seasons (April - Oct), major work will be completed in two phases, winter 2020 and winter 2021, with installation of solar and HVAC by summer 2020, and full weatherization anticipated to be complete by summer 2021.

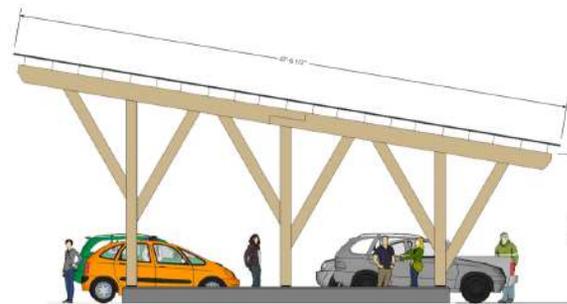
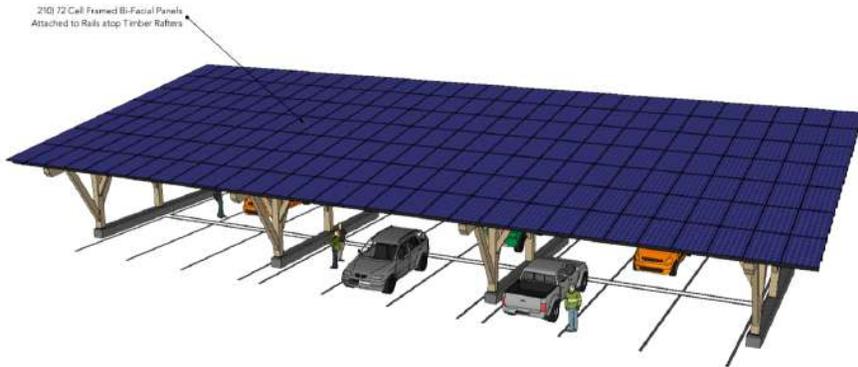


# SOLAR ARRAY CURRENT + FUTURE



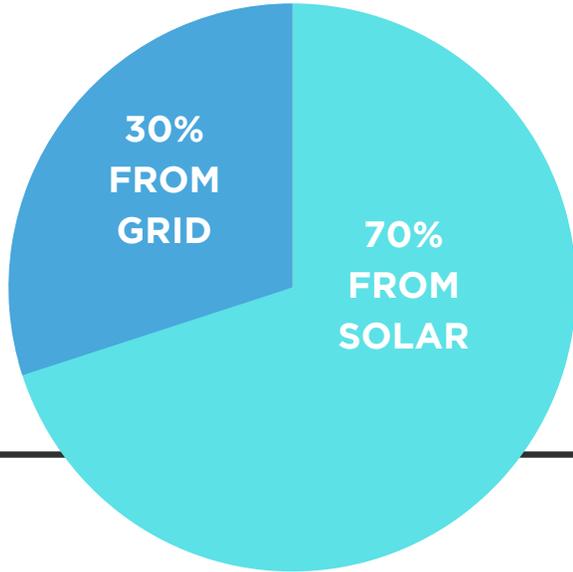
# NEW SOLAR ARRAYS + CHARGING STATION

VISUALS + INSPIRATION



*Inspiration for new solar array and functional congregation point, using wood as sustainable material*

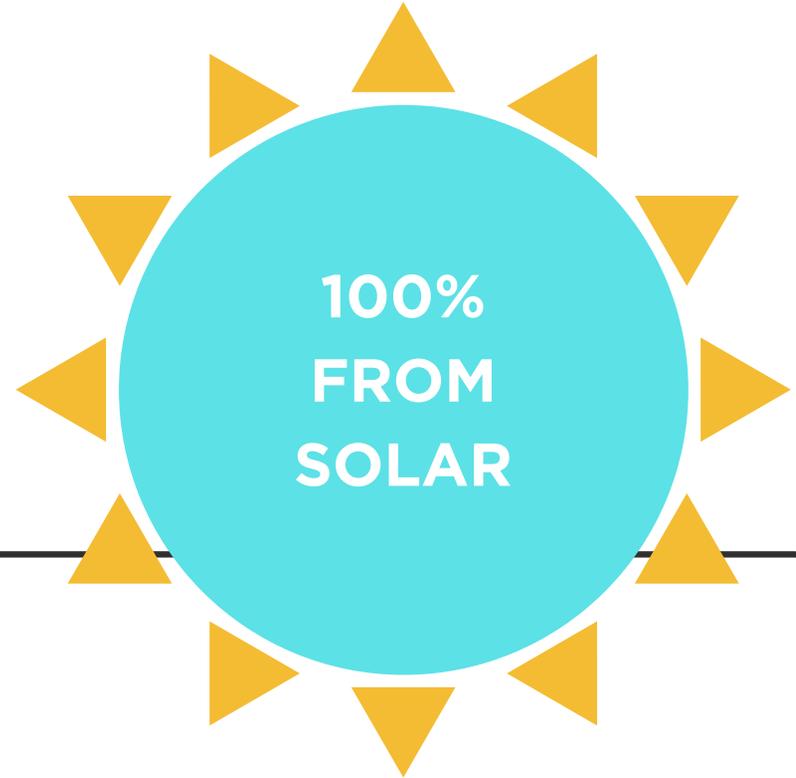
# CURRENT ENERGY USAGE



**50 kW solar array (installed in 2013 with incentive from NYSERDA) provides 70% of total building energy for seasonal use**

- Currently, Basilica is only used as a seasonal space April - Nov
- Only 15% of spaces are conditioned for year-round use

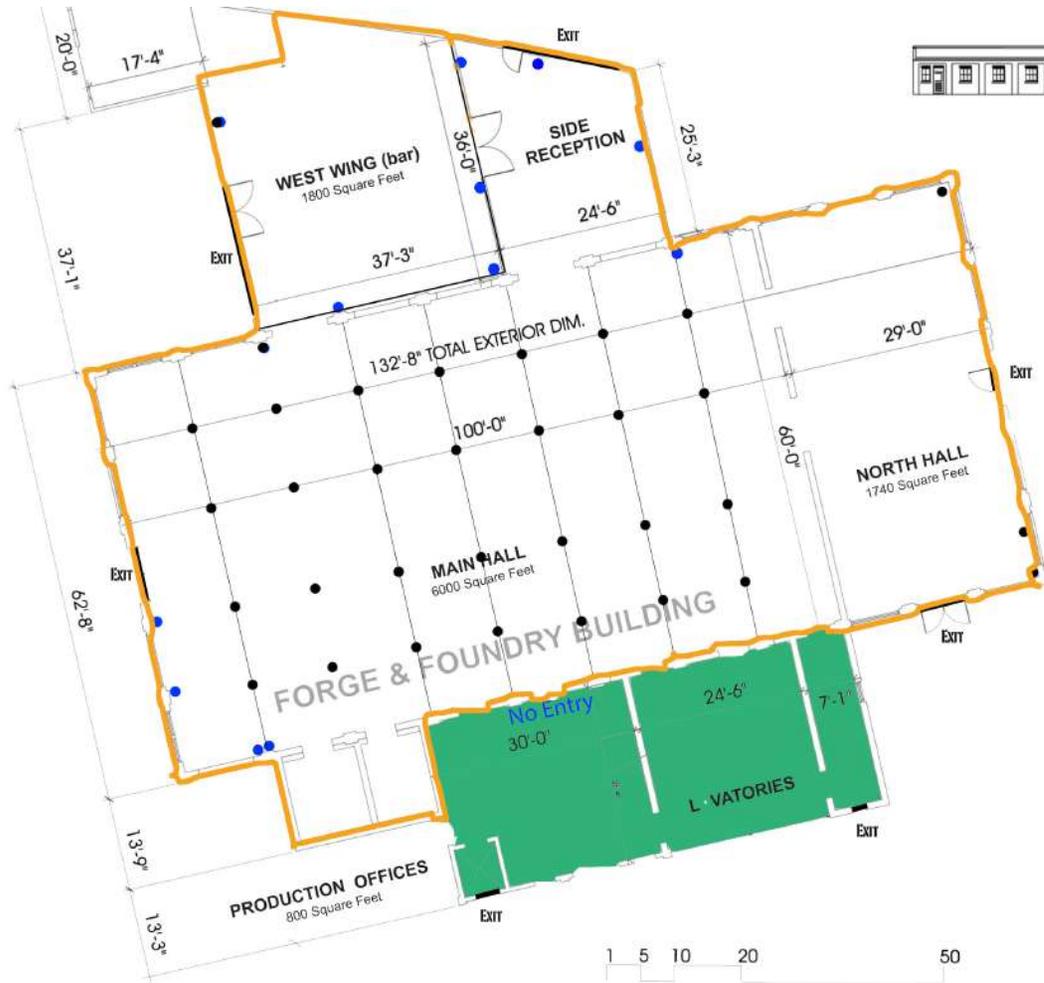
# FUTURE ENERGY USAGE



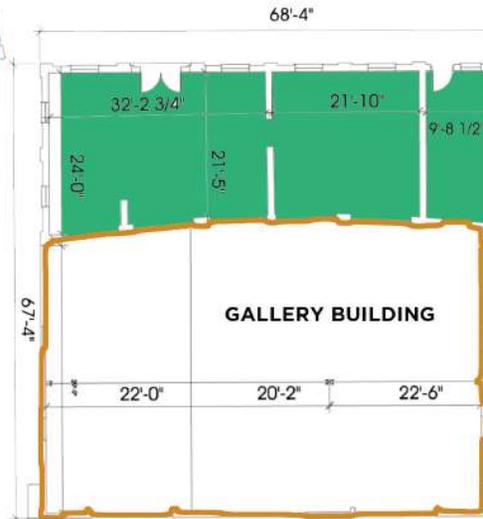
**New 100 kW + existing 50 kW solar array provides 100% of total building energy for year-round use**

- 100% of spaces usable 12 months a year powered by 100% renewable energy

# BASILICA HUDSON FLOOR PLAN



Specifications:	
Land:	2.5 acres
Forge and Foundry Structure:	13,700 Square feet
Gallery:	4,300 Square feet
Electricity:	1200 amps 3 phase
Water:	City of Hudson
Sewer:	City of Hudson
Gas:	Connection from National Grid
Construction:	
1 6 inch square brick columns on 12 foot centers.	
Steel roof trusses with bolt and rivets.	
Fired terra cotta tiles in steel channels	
Roof: Metal	
Ceiling height at outside wall : 20 feet	
Ceiling height at center : 40 feet	



- ALREADY CONDITIONED
- TO BE CONDITIONED



# NEW EQUIPMENT



Mitsubishi Y-series heat pumps for conditioning spaces



Sanden heat pump for radiant and domestic hot water



Dynapower 250 kW battery storage system

# TO BE REMOVED



- Two 180 BTU and other smaller propane heaters
- Current gas stove would be replaced with an induction stove.

Using **100% SOLAR** and **0% FOSSIL FUEL** to serve all energy needs for both buildings

# WINTERIZATION RENOVATION

Basilica is also planning critical weatherization renovations to seal the envelope (insulation, roof, windows and doors) to allow year round, efficient HVAC usage and energy performance. The spectacular 1880s building will require significant improvements to enhance the thermal enclosure:

- Extreme Weatherization of Main Building windows
  - Restoring old sash and building new ones with new weather stripping at every contact point with window casing
  - Building new storm windows to be sealed with a complete bulb seals around perimeter, ensuring 100% air sealing
- For fixed window panels, using Low-E thermopane glass.
- Extensive pointing and masonry work
  - Repair and point deteriorating brick and mortar of the entire 13,000 sq. ft. Main Hall to reduce air penetrations.
- Insulation of roof areas
  - 4"-6" of polyiso on the roof of the 13,000 sq foot Main Hall.
  - 6-8" on West Wing, Office and Back Gallery spaces.
- Comprehensive winterization of all doors
  - 10 in Main Building (majority double doors) and 4 in Gallery Building
  - Double sealing of door jams and use of drops seals at the base of each door.
  - Seals to be supplied by Conservation Technologies



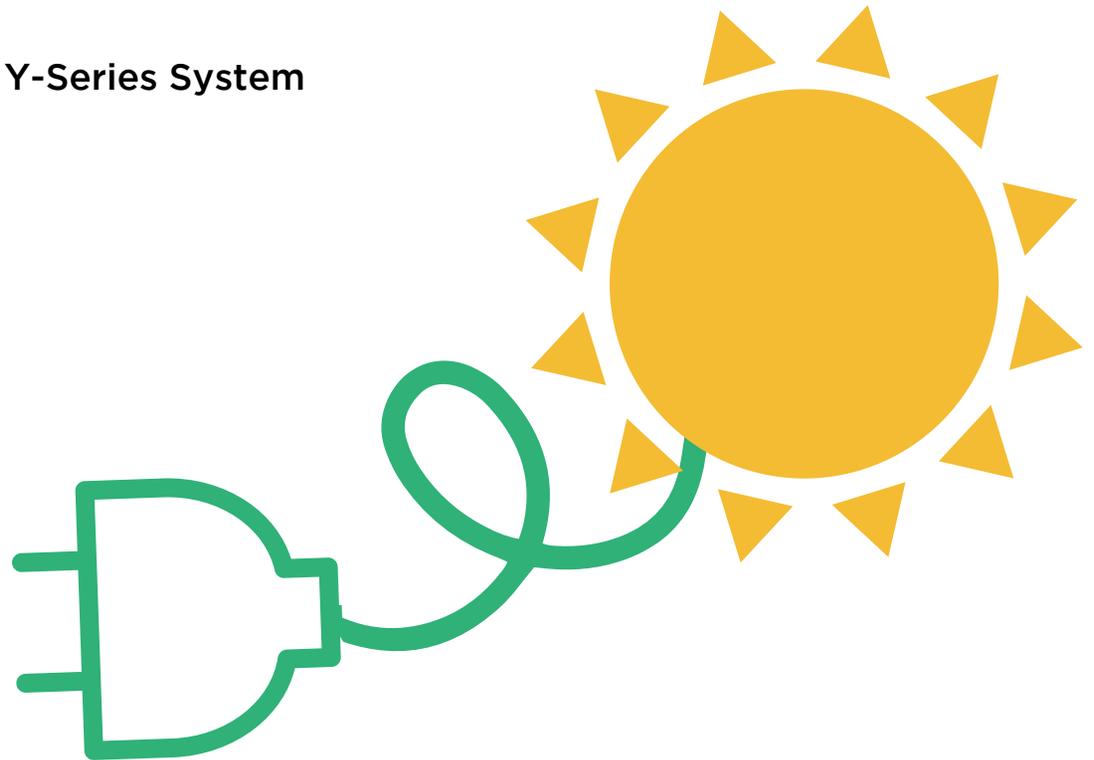
# ENERGY LOADS

## Energy (load) analysis: 40 tons

800 amp 3 phase electricity will be maintained, and combined, with the existing 50 KWH solar array plus the new 30 KWH and 70 KWH solar arrays to produce enough energy to power the new Mitsubishi Hyper Heat Y-Series heat pump system, four additional 240V electric car charging stations, all new equipment (water heaters, induction stove, etc.) and all current systems and equipment. Currently, the 50 KWH solar array produces energy to power lighting, four M-Series split system heating units and one 240V electric car charging station.

## HVAC 40 Ton Mitsubishi Hyper Heat Y-Series System

- Main Hall: 31 TONS
- Offices: 3 TONS
- Gallery Building: 6 TONS



# PROVEN SUCCESS

## RIVER HOUSE PROJECT

- Another historic Hudson building transformed by Basilica Hudson co-founders
- 20,000 sq. ft net zero building
  - Removed 3 inch gas line from building
  - 100% net zero
  - Mitsubishi Y-series heat pumps for heating and cooling
  - Stiebel Eltron domestic hot water system
  - Off-site solar supplier
  - Extreme weatherization of windows and doors

*Supported by*



nationalgrid





**BEFORE**



**CURRENT**



**FUTURE**



**OPEN 12 MONTHS A YEAR**  
 =  
**INCREASED ECONOMIC ACTIVITY**



# THE VISION

FROM ROCK SHOWS...



...TO WEDDINGS...



...ALL POWERED  
BY THE SUN

