



NEW HAVEN PUBLIC SCHOOLS

## Operations Memorandum

**To:** New Haven Board of Education Finance and Operations Committee

**From:** Steven Winter, Executive Director of Climate and Sustainability

**Date:** September 13, 2023

**Re:** Approval to enter into power purchase agreements (20 years) with Greenskies Clean Energy to install solar parking canopy systems at Hill Central School and LW Beecher School

**Answer all questions** and have a representative ready to present the details of each question during the Finance & Operations meeting or this proposal may not be advanced for consideration by the full Board of Education.

Company Information		
Vendor Name:	Greenskies Clean Energy LLC	
Doing Business as: <small>(DBA)</small>	Greenskies Clean Energy	
Vendor Address:	127 Washington Avenue, West Building, Lower Level, North Haven, CT 06473	
Vendor Contact Name:	Ryan Linares	
Vendor Contact Email:	rlinares@greenskies.com	
Is the contractor a minority or women owned small business?	No	
Agreement/Contract Information		
New or Renewal Agreement/Contract?	New	
Effective Dates: (mm/dd/yy) <small>Multi-yrs. require Board of Aldermen approval</small>	August 15 2023 (estimated date of solar array completion)	August 15 2043
Total Amount: <small>If Multi-yr. include yr. to yr. breakdown</small>	Please see attached schedule of annual savings/costs.	
Funding Source Name: Acct. #:	Board of Education Utilities (Electricity) 190-47400-52220	
Contract #: <small>(Local or State)</small>	To be determined, subject to final negotiation by Corporation Counsel	



NEW HAVEN PUBLIC SCHOOLS

**Key Questions:**

**1. What specific service will the contractor provide:**

The vendor will finance, design, install, commission, and maintain solar parking carport canopies over parking spaces at Hill Central School and LW Beecher School. The vendor will sell electricity produced by the solar array at each school to the City at a fixed rate over the twenty year term of the power purchase agreement. The solar canopies are projected to generate enough electricity to power 20% of Hill Central’s electricity consumption and 33% of Beecher’s electricity consumption. With the conservative assumption that the historic rate of electricity bill increases continue at 3% annually, the solar canopies are forecast to save ~\$275,000 over the term of the power purchase agreement.

**2. How was the contractor selected?** \*Attach appropriate supporting documents **[RFP ATTACHED]**

- Quotes
- Sealed Bid # \_\_\_\_\_
- Sole Source # \_\_\_\_\_
- RFP# \_2023-03-1537\_\_
- State Contract #
- Exempt Professional
  - Accountant
  - Actuary
  - Appraiser
  - Architect
  - Artist
  - Dentist
  - Engineer
  - Expert Professional Consultant
  - Land Surveyor
  - Lawyer
  - Physician/Medical Doctor

**3. If the vendor was selected through Solicitation (Bid/RFQ/RFP) process; answer the following:**

**a. Please explain how the vendor was chosen?** \*Attach Vendor Proposal **[PROPOSAL AND PROPOSAL EXCERPT OF BOARD OF EDUCATION SITES ATTACHED]**

The vendor was selected through a weighted score review that combined scores for the pricing provided, the technical systems proposed, the developer’s financial and operational capacity and history of performance, the history of completed projects with similar specifications in Connecticut.



NEW HAVEN PUBLIC SCHOOLS

<b>b. Who were the members of the selection committee?</b> <i>(Minimum 3 members required)</i>
Giovanni Zinn, City Engineer Steven Winter, Executive Director of Climate and Sustainability Maxim Teirstein, Sustainability Policy Analyst and Engagement Coordinator
<b>4. If this is a renewal with a current vendor, has the vendor met all obligations under the existing agreement/contract?</b>
N/A
<b>5. If this agreement/contract is a Renewal, has the cost increase? If yes, by how much?</b> <i>*Attach Renewal Letters</i>
N/A
<b>6. If this new agreement/contract, has cost for service increased from previous years? If yes, by how much?</b>
N/A
<b>7. Is this a service that existing staff could provide? Why or why not?</b>
Financing, installing, commissioning, and maintaining renewable energy systems requires knowledge and competency in specialized fields such as state and federal energy policy, project finance, and renewable energy system design, construction, and operations. These skills are challenging to develop. Given the frequency with which the City and Board of Education have completed renewable energy projects (this would be third set of projects in the last decade), it would difficult to justify maintaining this level of specialized expertise on staff and therefore it would not be practical for existing staff to provide this service.

	Solar Output with 0.50% Degradation Factor	Solar Electricity Cost	Estimated Utility Rate with 3.0% Escalation Factor	Rate Savings (Current Utility rate minus Solar rate)	Savings with <u>Solar</u>
Year	Solar kWh/Year	\$/kWh	\$/kWh	\$/kWh	\$
1	292,040	0.1297	0.120	-0.010	-\$2,833
2	290,580	0.1297	0.124	-0.006	-\$1,773
3	289,127	0.1297	0.127	-0.002	-\$692
4	287,681	0.1297	0.131	0.001	\$411
5	286,243	0.1297	0.135	0.005	\$1,535
6	284,812	0.1297	0.139	0.009	\$2,681
7	283,388	0.1297	0.143	0.014	\$3,850
8	281,971	0.1297	0.148	0.018	\$5,043
9	280,561	0.1297	0.152	0.022	\$6,260
10	279,158	0.1297	0.157	0.027	\$7,502
11	277,762	0.1297	0.161	0.032	\$8,769
12	276,373	0.1297	0.166	0.036	\$10,062
13	274,992	0.1297	0.171	0.041	\$11,382
14	273,617	0.1297	0.176	0.047	\$12,730
15	272,248	0.1297	0.182	0.052	\$14,105
16	270,887	0.1297	0.187	0.057	\$15,510
17	269,533	0.1297	0.193	0.063	\$16,944
18	268,185	0.1297	0.198	0.069	\$18,409
19	266,844	0.1297	0.204	0.075	\$19,904
20	265,510	0.1297	0.210	0.081	\$21,432
<b>Total</b>	<b>5,571,511</b>	<b>0.1297</b>	<b>0.161</b>	<b>0.032</b>	<b>\$171,232</b>

kWh  
Degredation  
Solar Rate  
Utility Rate  
Escalator  
Utility Inflation

292,040
0.50%
0.1297
0.12
0.00%
3.00%



**RFP #2023-03-1537 SOLAR POWER PURCHASE AGREEMENT  
CITY OF NEW HAVEN, CONNECTICUT**



**BIDDER NAME:  
GREENSKIES CLEAN ENERGY  
127 WASHINGTON AVENUE NORTH HAVEN, CT 06473  
CONTACT PERSON: RYAN LINARES  
PH: 203-645-9215**

**SUBMITTED TO:  
CITY OF NEW HAVEN, CONNECTICUT**

**DUE DATE: MAY 23, 2023 (11:00 AM)**

**Project #4:** 140 Legion Ave, New Haven (Hill Career) – Opportunity on hold until incentives increase for FTM carports.

**Project #5:** 399 Munson St, New Haven (Hill House HS) - Opportunity on hold until incentives increase for FTM carports.

**Project #6:** 181 Mitchell Drive, New Haven (Wilbur Cross HS) - Opportunity on hold until incentives increase for FTM carports.

**Project #7:** 140 Dewitt Street, New Haven (Hill Central)

1.) Annual output: 289,700 kWhs (Year 1 production)

2.) To determine the year (1) production estimate, GCE ran a PVsyst simulation. This software takes into consideration local historical weather trends using data provided by Sikorsky Memorial Airport. We also factor in any nearby encumbrances that may shade the array during portions of the day (trees, poles, etc.). Each year the production will likely degrade by 0.50%. The PVsyst report can be provided upon request.

3.) Proposed monthly rate schedule:

Month (Year 1)	PPA Rate Schedule (\$/kWh)	Monthly Production	Monthly Cost of Solar (\$)
January	\$ 0.1436	11,791.00	\$ 1,693.19
February	\$ 0.1436	15,093.00	\$ 2,167.35
March	\$ 0.1436	24,566.00	\$ 3,527.68
April	\$ 0.1436	28,999.00	\$ 4,164.26
May	\$ 0.1436	34,532.00	\$ 4,958.80
June	\$ 0.1436	36,878.00	\$ 5,295.68
July	\$ 0.1436	37,400.00	\$ 5,370.64
August	\$ 0.1436	33,025.00	\$ 4,742.39
September	\$ 0.1436	26,333.00	\$ 3,781.42
October	\$ 0.1436	18,541.00	\$ 2,662.49
November	\$ 0.1436	12,747.00	\$ 1,830.47
December	\$ 0.1436	9,792.00	\$ 1,406.13
Total	\$ 0.1436	289,697.00	\$ 41,600.49

4.) The NRES auction price proposed for this project is \$0.05148/kWh

5.) Price Schedule:

## Greenskies Clean Energy

Contract Year	PPA Price (\$/kWh)	Expected NRES REC (\$/MWh)
1	\$ 0.1436	\$ 0.05148
2	\$ 0.1436	\$ 0.05148
3	\$ 0.1436	\$ 0.05148
4	\$ 0.1436	\$ 0.05148
5	\$ 0.1436	\$ 0.05148
6	\$ 0.1436	\$ 0.05148
7	\$ 0.1436	\$ 0.05148
8	\$ 0.1436	\$ 0.05148
9	\$ 0.1436	\$ 0.05148
10	\$ 0.1436	\$ 0.05148
11	\$ 0.1436	\$ 0.05148
12	\$ 0.1436	\$ 0.05148
13	\$ 0.1436	\$ 0.05148
14	\$ 0.1436	\$ 0.05148
15	\$ 0.1436	\$ 0.05148
16	\$ 0.1436	\$ 0.05148
17	\$ 0.1436	\$ 0.05148
18	\$ 0.1436	\$ 0.05148
19	\$ 0.1436	\$ 0.05148
20	\$ 0.1436	\$ 0.05148

### **Project #8:** 100 Jewell Street, New Haven (LW Beecher School)

1.) Annual output: 289,700 kWhs (Year 1 production)

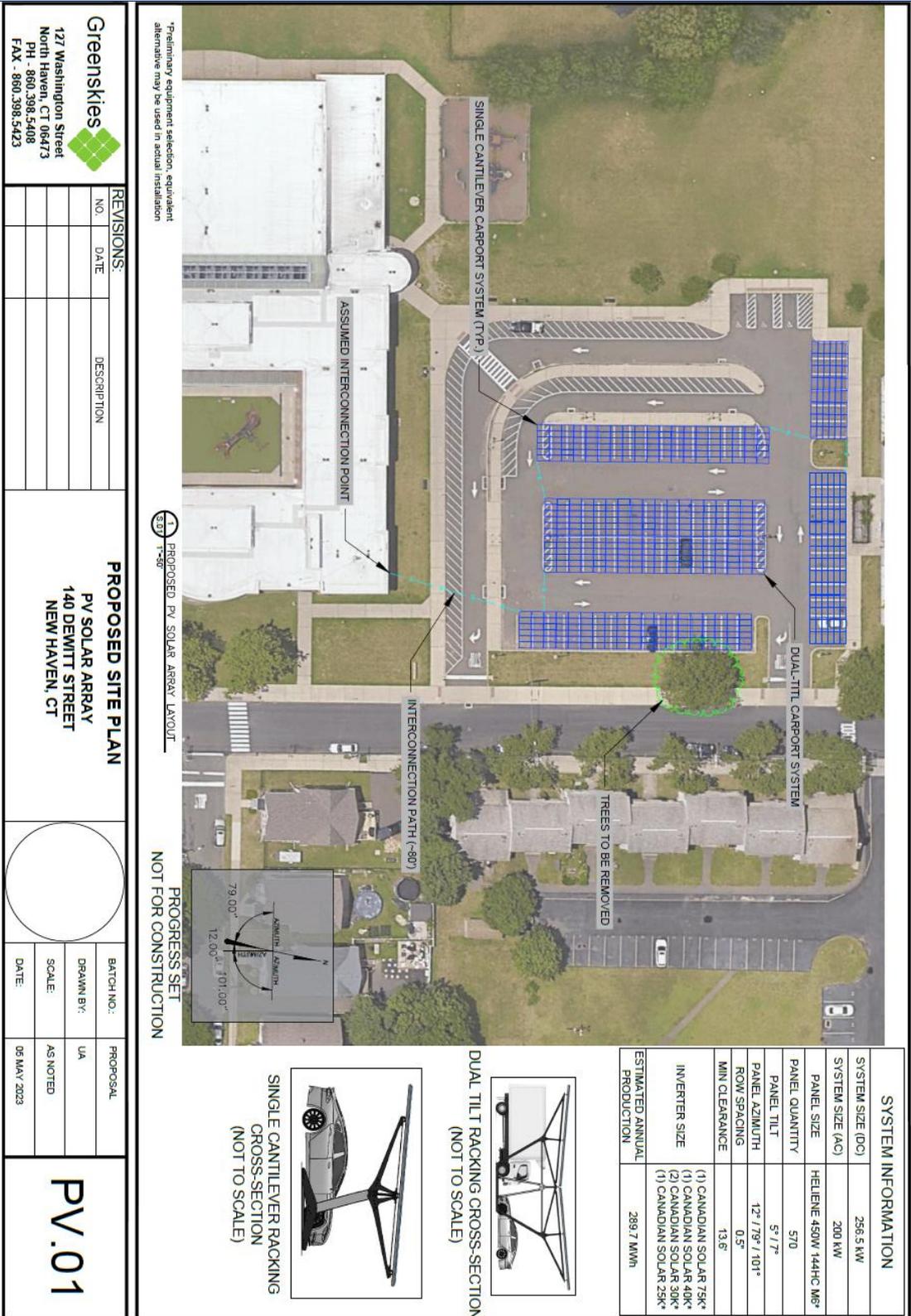
2.) To determine the year (1) production estimate, GCE ran a PVsyst simulation. This software takes into consideration local historical weather trends using data provided by Sikorsky Memorial Airport. We also factor in any nearby encumbrances that may shade the array during portions of the day (trees, poles, etc.). Each year the production will likely degrade by 0.50%. The PVsyst report can be provided upon request.

3.) Proposed monthly rate schedule:

Month (Year 1)	PPA Rate Schedule (\$/kWh)	Monthly Production	Monthly Cost of Solar (\$)
January	\$ 0.1297	11,886.00	\$ 1,541.61
February	\$ 0.1297	15,215.00	\$ 1,973.39
March	\$ 0.1297	24,765.00	\$ 3,212.02
April	\$ 0.1297	29,233.00	\$ 3,791.52
May	\$ 0.1297	34,811.00	\$ 4,514.99
June	\$ 0.1297	37,177.00	\$ 4,821.86
July	\$ 0.1297	37,702.00	\$ 4,889.95
August	\$ 0.1297	33,293.00	\$ 4,318.10
September	\$ 0.1297	26,546.00	\$ 3,443.02
October	\$ 0.1297	18,691.00	\$ 2,424.22
November	\$ 0.1297	12,850.00	\$ 1,666.65
December	\$ 0.1297	9,871.00	\$ 1,280.27
Total	\$ 0.1297	292,040.00	\$ 37,877.59

4.) The NRES auction price proposed for this project is \$0.05148/kWh

5.) Price Schedule:



\*Preliminary equipment selection, equivalent alternative may be used in actual installation

PROPOSED PV SOLAR ARRAY LAYOUT

PROGRESS SET NOT FOR CONSTRUCTION

SYSTEM INFORMATION	
SYSTEM SIZE (DC)	256.5 kW
SYSTEM SIZE (AC)	200 kW
PANEL SIZE	HELIOENE 450W /444HC M6*
PANEL QUANTITY	570
PANEL TILT	5° / 7°
PANEL AZIMUTH	12° / 79° / 101°
ROW SPACING	0.5'
MIN CLEARANCE	13.6'
INVERTER SIZE	(1) CANADIAN SOLAR 75K* (1) CANADIAN SOLAR 40K* (2) CANADIAN SOLAR 30K* (1) CANADIAN SOLAR 25K*
ESTIMATED ANNUAL PRODUCTION	289.7 MWh



DUAL TILT RACKING CROSS-SECTION (NOT TO SCALE)

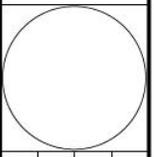


SINGLE CANTILEVER RACKING CROSS-SECTION (NOT TO SCALE)

**Greenskies**  
127 Washington Street  
North Haven, CT 06473  
PH - 860.398.5408  
FAX - 860.398.5423

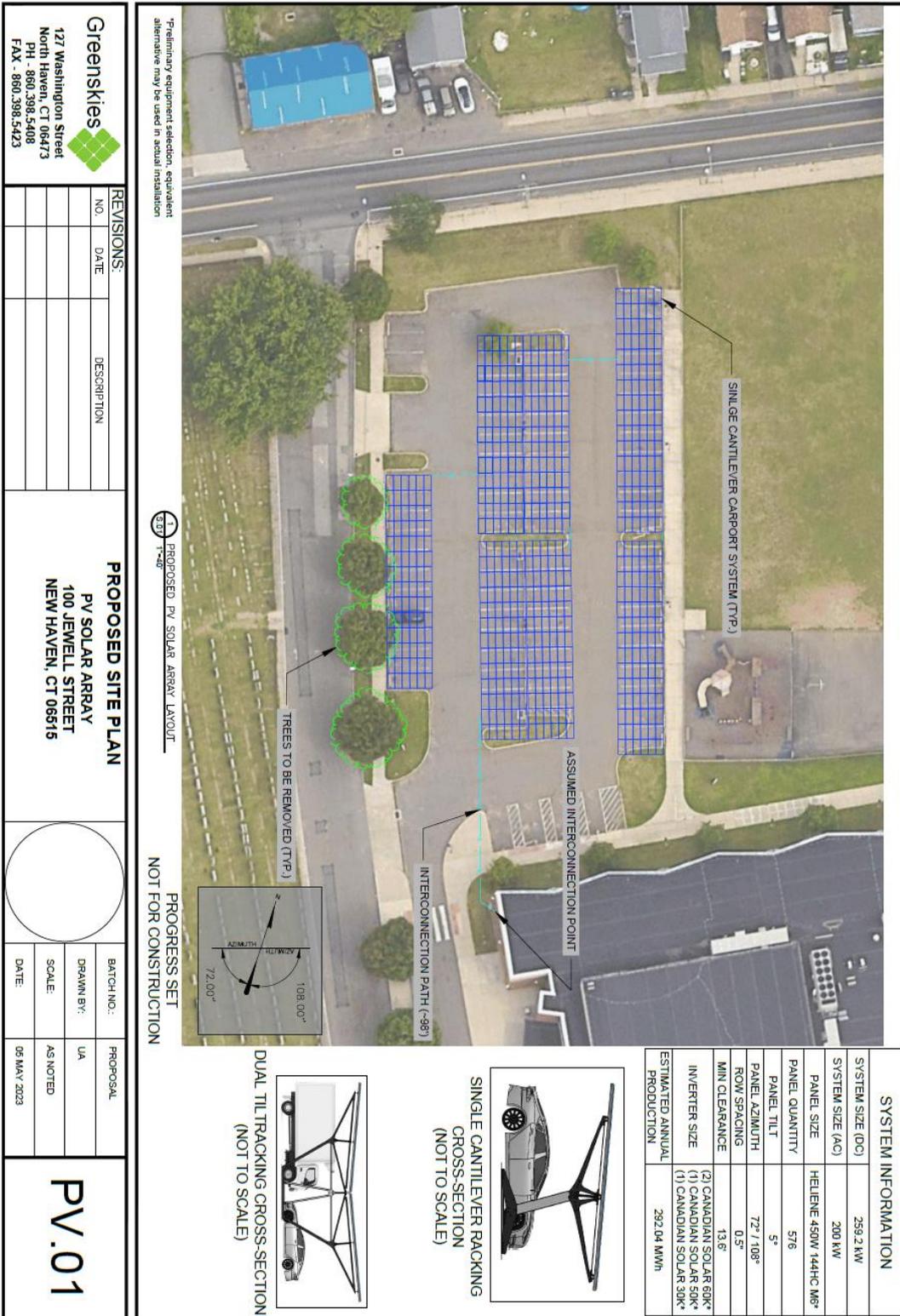
REVISIONS:		
NO.	DATE	DESCRIPTION

**PROPOSED SITE PLAN**  
PV SOLAR ARRAY  
140 DEMITT STREET  
NEW HAVEN, CT



BATCH NO.:	PROPOSAL
DRAWN BY:	UA
SCALE:	AS NOTED
DATE:	05 MAY 2023

**PV.01**

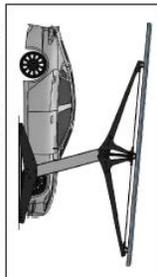


\*Preliminary equipment selection, equivalent alternatives may be used in actual installation

PROPOSED PV SOLAR ARRAY LAYOUT

PROGRESS SET  
NOT FOR CONSTRUCTION

SYSTEM INFORMATION	
SYSTEM SIZE (DC)	259.2 kW
SYSTEM SIZE (AC)	200 kW
PANEL SIZE	HELIOENE 450W 144HC M6*
PANEL QUANTITY	576
PANEL TILT	5°
PANEL AZIMUTH	72° / 108°
ROW SPACING	0.5'
MIN CLEARANCE	13.6'
INVERTER SIZE	(2) CANADIAN SOLAR 60K* (1) CANADIAN SOLAR 50K* (1) CANADIAN SOLAR 30K*
ESTIMATED ANNUAL PRODUCTION	292.04 MWh



SINGLE CANTILEVER RACKING  
CROSS-SECTION  
(NOT TO SCALE)



DUAL TILT TRACKING CROSS-SECTION  
(NOT TO SCALE)

**Greenskies**  
127 Washington Street  
North Haven, CT 06473  
PH - 860.398.5408  
FAX - 860.398.5423

**REVISIONS:**

NO.	DATE	DESCRIPTION

**PROPOSED SITE PLAN**

PV SOLAR ARRAY  
100 JEWELL STREET  
NEW HAVEN, CT 06515

BATCH NO.: PROPOSAL

DRAWN BY: UA

SCALE: AS NOTED

DATE: 05 MAY 2023

PV.01



**City of New Haven**  
**Office of Management and Budget**  
**Justin M. Elicker, Mayor**

**Michael Gormany, City Budget Director and Acting Controller**

Meeting Minutes Friday, September 8, 2023 of Energy Committee Via Zoom

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**Committee Members Present:**

1. Michael Gormany, Acting Controller
2. Salvatore DeCola, Aldermanic Representative
3. Giovanni Zinn, City Engineer
4. Thomas Lamb, COO, Board of Education
5. Malinda Figueroa, Purchasing Agent

**Other Attendees:**

- Steven Winter, Executive Director of Climate and Sustainability
- Alexey Cherniak, Principal Analyst, Veolia/SourceOne
- Brant Davis, Vice President, Commodity Management, Veolia/SourceOne

**Meeting Minutes:**

- Call to order of the meeting by Michael Gormany at 11:30 AM
- Gormany begins discussion on agenda items #1 and #2 and turns the discussion over to Steven Winter
- Winter begins the presentation on power purchase agreements (20 years) for solar arrays on City property
- Gormany asked for any questions from committee members starting with Giovanni Zinn
- Malinda Figueroa asked whether the Q House's roof warranty would be affected.
  - Zinn stated it would not be affected.
- Winter begins the presentation on power purchase agreements (20 years) for solar arrays on BoE property (Hill Central and LW Beecher schools)
- Gormany asked for any questions from committee members starting with Giovanni Zinn
- Thomas Lamb asked when this would happen and what impact it would have to the school year. This is the only parking lot for the school, so it could only occur in the summer months, since we'd have to shut the lot down.
  - Winter replied that he'd confirm with the developer that making the installation over the summer months would be feasible and to see how they've dealt with this at other schools.
- Thomas Lamb asked whether the savings would be attributable to the BoE budget.
  - Gormany replied that anything related to the BoE would be offset on their budgetary side, not the city.
- Malinda Figueroa asked about whether snow plowing efforts will be hindered by the contractor.
  - Winter replied that he'd look into how other cities have approached this issue.
- Thomas Lamb asked whether there's a way to avoid vandalism and students climbing on the array.
  - Winter replied that he'd look into strategies to deterrents to climbing on the array.
- Thomas Lamb proposed installing 1-2 electric vehicle chargers into the design of the array.
  - Winter replied that his office would try to wrap that into future plans for solar and that he'd be interested in connecting with the Board of Education to see how level 2 charging stations could be installed on BoE property even sooner.



**City of New Haven**  
**Office of Management and Budget**  
**Justin M. Elicker, Mayor**

**Michael Gormany, City Budget Director and Acting Controller**

- Gormany begins discussion on agenda item #3 and turns the discussion over to Alexey Cherniack
- Cherniack begins the presentation on the City's electricity purchasing for the winter
- Thomas Lamb, due to an early departure from the meeting, interjected to state that he would have voted in favor of the items discussed, had he stayed until the end of the meeting.
- Giovanni Zinn asked Alexey Cherniack whether the geopolitical influences on the energy market have stabilized.
  - Cherniack responded, "When we were looking at the market a year ago, the price for the same period last year was about \$200 or, you know, maybe \$190. Now it's about \$111. The market, and at least in in the US, has definitely stabilized. We still think, you know, winter can be a risk."
- Giovanni Zinn asked Alexey Cherniack, "Why 65 instead of 50?"
  - Cherniack responded, "We suggested a range of 50-75%. I think there's a lot of room for debate within that. It really comes down to the overall tolerance for budget variance. I would not be opposed to 50%."
- Gormany asked for any questions from committee members starting with Alder Decola
- Giovanni Zinn asked his committee members whether they have appetite for adjusting the 65% recommendation from SourceOne.
  - Gormany responded that he had imagined the number being 60%, since there was such a large range between 50 and 75%. Possibly being on the lower end of the range may be more beneficial to the City.
  - Zinn replied that it's a fairly small shift, but a responsible (yet not "earth-shattering") shift from the usual 75%.
  - Gormany agreed and clarified: 60% and 40%.
- Gormany began the motion needing approval (agenda item 1)
- Giovanni Zinn moved the motion
- Alder DeCola Seconded
- Unanimous approval 4-0
- Gormany began the motion needing approval (agenda item 2)
- Giovanni Zinn moved the motion
- Alder DeCola Seconded
- Unanimous approval 4-0
- Gormany began the motion needing approval (agenda item 3), using 60% and 40%
- Giovanni Zinn moved the motion, with the stipulation of 60% in the forward market and 40% in the day ahead market
- Alder DeCola Seconded
- Unanimous approval 4-0
- Motion for Adjournment
- Zinn Moved
- Alder DeCola Seconded
- Unanimous 4-0 Approval
- Committee adjourned at 12:07 PM

**Agenda**

**Action Items requiring a vote**



**City of New Haven**  
**Office of Management and Budget**  
**Justin M. Elicker, Mayor**

**Michael Gormany, City Budget Director and Acting Controller**

1. Utilizing the state's Non-Residential Renewable Energy Solutions program, the City is seeking approval to enter into power purchase agreements (20 Years) and any associated leases and technical agreements, to install solar arrays at the Q House, 200 Wintergreen Avenue, and the City's capped landfill.
  - a. Presenter: Steven Winter, Executive Director of Climate and Sustainability
2. Utilizing the state's Non-Residential Renewable Energy Solutions program, the City is seeking approval to enter into power purchase agreements (20 Years) to install solar parking canopy systems at Hill Central School and LW Beecher School, subject to approval by the Board of Education.
  - a. Presenter: Steven Winter, Executive Director of Climate and Sustainability
3. Does the City wish to mitigate its electric budget exposure by locking a portion of this upcoming winter?
  - a. Presenter: SourceOne



Legislation Details (With Text)

**File #:** LM-2023-0468      **Version:** 2      **Name:**

**Type:** Order      **Status:** In Committee

**File created:** 8/16/2023      **In control:** City Services and Environmental Policy

**On agenda:**      **Final action:**

**Title:** ORDER OF THE NEW HAVEN BOARD OF ALDERS AUTHORIZING SOLAR POWER PURCHASE AGREEMENTS.

**Sponsors:**

**Indexes:**

**Code sections:**

**Attachments:** 1. CHECK LIST\_Solar Power Purchase Agreements, 2. COVER LETTER\_Solar Power Purchase Agreements, 3. ORDER - solar power purchase agreements, 4. PRIOR NOTIFICATION FORM\_Solar Power Purchase Agreements, 5. FISCAL IMPACT STMT\_Solar Power Purchase Agreements

Date	Ver.	Action By	Action	Result
9/5/2023	1	Board of Alders	Referred	

ORDER OF THE NEW HAVEN BOARD OF ALDERS AUTHORIZING SOLAR POWER PURCHASE AGREEMENTS.

WHEREAS, in 2019, the City of New Haven formally recognized the urgency of the climate crisis and ordered to act by adopting a Climate Emergency Order in, and

WHEREAS, the City of New Haven is committed to energy efficiency and renewable energy projects to reduce energy costs and protect the environment, and

WHEREAS, the State of Connecticut in Public Act 19-35 amended the process for auctioning Renewable Energy Credits (RECs) through the Non-Residential Renewable Energy Solutions (NRES) program to facilitate the financing of solar projects, and

WHEREAS, solar arrays on City buildings and sites funded through power purchase agreements can provide New Haven with low-cost electricity without any bonded capital outlay, and

WHEREAS, solar power purchase agreements can provide savings of over 25% relative to current electricity costs and can also generate new revenues from the City through lease agreements, and

WHEREAS, the City has twice utilized solar power purchase agreements to install solar panels on City schools and produce energy savings, and

WHEREAS, various City buildings and sites have been identified as potential candidates for solar arrays, and

WHEREAS, distributed generation systems such as solar arrays require separate interconnection agreements with the local electrical distribution company in order to operate, and

WHEREAS, the large-scale project proposed for the flat top of the City's capped landfill requires a lease agreement in addition to a power purchase agreement, and

WHEREAS, the City of New Haven Energy Committee has been previously empowered by the Board of Alders to make specific recommendations regarding energy purchases, and

WHEREAS, the City of New Haven Energy Committee includes Aldermanic representation.

NOW, THEREFORE, BE IT ORDERED by the Board of Alders of the City of New Haven that the Mayor is authorized and empowered to enter into power purchase agreements for a twenty year term for City-owned facilities or sites (including Board of Education facility sites), subject to the approval of the City of New Haven Energy Committee. In addition, the Mayor is authorized and empowered to enter into any leases and any utility agreements required for the installation and technical execution of the aforementioned power purchase agreements, including but not limited to electrical interconnection agreements and a lease of a section of the City's capped landfill.