Nova Group

Inspired Solutions by Nova Group

MERP Level 2 Energy Audit

Prepared For

Department of Buildings & General Services - State of Vermont
133 State Street
Montpelier, VT 05633

Grand Isle - Free Library
10 Hyde Rd
Grand Isle, VT 05458

Nova Group Carbon Neutral Report

novagroupgbc.com/carbonneutral

September 18, 2024

Department of Buildings & General Services - State of Vermont
133 State Street
Montpelier, VT 05633

Re: MERP Level 2 Energy Audit
Grand Isle - Free Library
10 Hyde Rd
Grand Isle, VT 05458
Nova Project No.: SE24-2607

Nova Group, GBC has completed a MERP Level 2 Energy Audit in accordance with the State of Vermont ACT 172 at Grand Isle - Free Library located at 10 Hyde Rd in Grand Isle, VT. Nova Group, GBC visited the site on April 5, 2024.

The assessment was performed at the Client's request using methods and procedures consistent with and using methods and MERP Level 2 Energy Audit procedures as outlined in Nova Group, GBC Proposal.

This report has been prepared for and is exclusively for the use and benefit of the Client identified on the cover page of this report. The purpose for which this report shall be used shall be limited to the use as stated in the contract between the client and Nova Group, GBC.

This report, or any of the information contained therein, is not for the use or benefit of, nor may it be relied upon by any other person or entity, for any purpose without the advance written consent of Nova Group, GBC. Any reuse or distribution without such consent shall be at the client's or recipient's sole risk, without liability to Nova Group, GBC.

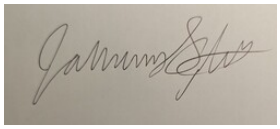
Estimated installation costs are based on Nova Group, GBC experience on similar projects and industry standard cost estimating tools including *RS Means*. Since actual installed costs may vary widely for particular installation based on labor & material rates at time of installation, Nova Group, GBC does not guarantee installed cost estimates and shall in no event be liable should actual installed costs vary from the estimated costs herein. We strongly encourage the owner to confirm these cost estimates independently. Nova Group, GBC does not guarantee the costs savings estimated in this report. Nova Group, GBC shall in no event be liable should the actual energy savings vary from the savings estimated herein.

Nova Group, GBC certifies that Nova Group, GBC has no undisclosed interest in the subject property and that Nova Group, GBC employment and compensation are not contingent upon the findings or estimated costs to remedy any deficiencies due to deferred maintenance and any noted component or system replacements.

Respectfully submitted,

NOVA GROUP, GBC

Reviewed by:



Johanna Stuz, BPI-BA
Field Associate

Jay Hrivnatz, RA, CEM
Technical Reviewer

Keely Felton, CEA
Chief Sustainability Officer

Table of Contents

1.0 EXECUTIVE SUMMARY

1.1 General Description

1.1.1 Purpose

The purpose of this MERP Level 2 Energy Audit is to provide the State of Vermont - Building and General Services and Grand Isle - Free Library with energy efficiency opportunities at the facility and specific recommendations for Energy and Conservation Measures (ECM's). Information obtained from these analyses may be used to support a future application to an Energy Conservation Program, Utility grants towards energy conservation, or as a basis for replacement of equipment or systems.

1.1.2 Scope of Work

1.1.2.1 Energy Audit Scope of Work

The purpose of this Energy Assessment is to provide the State of Vermont - Building and General Services and Grand Isle - Free Library with a baseline of energy usage, the relative energy efficiency of the facility, and specific recommendations for Energy Conservation Measures. Information obtained from these analyses may be used to support a future application to an Energy Conservation Program, Federal and Utility grants towards energy conservation, as well as support performance contracting, justify a municipal bond-funded improvement program, or as a basis for replacement of equipment or systems.

The energy assessment consisted of an onsite visual assessment to determine current conditions, itemize the energy consuming equipment (i.e. Boilers, Make-Up Air Units, DWH equipment); review lighting systems both exterior and interior; and review efficiency of all such equipment. The study also included interviews and consultation with operational and maintenance personnel. The following is a summary of the tasks and reporting that make up the Energy Assessment portion of the report.

The following is a summary of the tasks and reporting that make up the Energy Assessment portion of the report.

Energy and Water Using Equipment

Nova Group, GBC has surveyed the tenant spaces, common areas, offices, maintenance facilities and mechanical rooms to document utility-related equipment, including heating systems, cooling systems, air handling systems and lighting systems.

Building Envelope

Nova Group, GBC has reviewed the characteristics and conditions of the building envelope, checking insulation values and conditions where accessible. This review also includes an inspection of the condition of walls, windows, doors, roof areas, insulation and special use areas.

Recommendations for Energy Savings Opportunities

Based on the information gathered during the on-site assessment, the utility rates, as well as recent consumption data and engineering analysis, Nova Group, GBC has identified opportunities to save energy and provide probable construction costs, projected energy/utility savings and provide a simple payback analysis.

Energy Assessment Process

- Interviewing staff and review plans and past upgrades
- Performing an energy assessment for each use type. Performing a preliminary evaluation of the utility system
- Making preliminary recommendations for system energy improvements and measures
- Estimating initial cost

Reporting

The Nova Group, GBC Energy Assessment Report includes:

- A comprehensive study identifying all applicable Energy Conservation Measures (ECMs) and priorities, based on initial cost.

1.2 Findings

1.2.1 Energy Conservation Measure Sorting

Simple Payback Period – The number of years required for the cumulative value of energy cost savings less future non-fuel costs to equal the investment costs of the building energy system, without consideration of discount rates. ECMs with a payback period greater than the Expected Useful Life (EUL) of the project are not typically recommended for loan-funded energy projects, as the cost of the project will not be recovered during the lifespan of the equipment; however they will be considered for energy projects funded by the MERP Implementation Grant. These ECMs are recommended for implementation during future system replacement. At that time, replacement may be evaluated based on the premium cost of installing energy efficient equipment. The ECMs presented in the table below are presented in order of priority of payback, however ECM's involving resilience components will be prioritized accordingly.

$$\textit{Simple Payback} = \frac{\textit{Initial Cost}}{\textit{Annual Savings}}$$

Interactive Energy Conservation Measures - This analysis excludes the interactive effects of Energy Conservation Measures. Due to the significant interactive effects between the ECMs that include the replacement or modification of the Heating Ventilation and Air Conditioning Systems and the other recommended ECM's, the HVAC ECMs are presented independently of the ECMs that do not include the replacement or modification of HVAC equipment. Furthermore, a 10% discount in energy savings was applied to account for the interactive effects amongst the ECMs. In addition to the consideration of the interactive effects, Nova Group, GBC has applied a 15% contingency to the implementation costs to account for potential cost overruns during the implementation of the ECMs.

Interactive Energy Conservation Measures - The change in resultant energy saving estimates due to implementing multiple Energy Conservation Measure's that have indirect impacts on one another.

1.2.2 Assumptions

Nova Group, GBC has made the following assumptions in calculation of the Energy Conservation Measures.

- Building operating hours are assumed to be 32 hours per week.
- The facility occupancy is assumed to be five (5) people.
- Annual Heating Equipment Operating Hours are derived from actual consumption and equipment input rates to be 6,071 hours/year.

- Annual Cooling Equipment Operating Hours are derived from actual consumption and equipment input rates to be 2,697 hours/year.

1.2.3 Recommendations

Nova Group, GBC has recommended one (1) HVAC Energy Conservation measure options and nine (9) Energy Conservation Measures (ECMs) that do not modify or replace the existing HVAC.

HVAC option one (1) includes replacing the existing condensing gas furnace with a new condensing gas furnace.

The savings for each measure is calculated using standard engineering methods followed in the industry.

The following table summarizes the recommended ECMs in terms of description, investment cost, energy consumption reduction, and cost savings.

1.2.3.1 Solar and Battery Analysis

Nova Group, GBC has evaluated the site for a one (1) potential combined solar and battery system estimated at $57,350.

Option one (1) includes a 6.29 kW rated solar panel system and a 38.4 kWh storage battery system, sized for the current electric demand.

The roof is assumed to be older than ten (10) years and will need to be replaced with new asphalt shingles or metal panel roof before the system is installed.

The current electrical panel will likely need to be upgraded, a licensed electrical engineer should be consulted to verify.

The system was designed with a depth of discharge at 50% and a cold weather factor of 1.3 to provide energy for one (1) full day of power. The system assumes that net metering will be available as an option if the building needs are met. For additional information please see Appendix D.

On Site RENEWABLE GENERATION Solar Photovoltaic Analysis with Battery	
	Option One (1) - Current Demand
Estimated number of panels	17
Estimated kW Rating	6.29 kW
Potential Annual kWh Produced	6,752 kWh solar system with a 38.4 kWh battery storage system
% of Current Electricity Demand	96%
New Roof Cost	$6,600
New Electrical Panel Cost	$5,000
Battery Investment Cost	$26,880
Solar Investment Cost	$18,870
Federal Investment Tax Credit (FITC)	$13,725

On Site RENEWABLE GENERATION Solar Photovoltaic Analysis with Battery	
Total Investment Cost (Solar+ Battery + Electrical Panel + Roof)	$57,350
Estimated Annual Energy Cost Savings	$1,233
Payback without Incentives	46.51 Years
Payback with all Incentives	35.4 Years

ECM Recommendation

HVAC Energy Conservation Measures

Evaluated Energy Conservation Measures with Savings												
ECM #	Description of ECM	Projected Initial Investment ($)	Natural Gas (Therms)	Propane (gal)	No. 2 Oil (gal)	Wood Pellets (Tons)	Electricity (kWh)	Energy Savings (kBTU)	% Savings (Energy)	Estimated Annual Maintenance Savings	Total Estimated Annual Cost Savings ($)	Simple Payback (Years)
Evaluated Measures												
1	Replace the existing condensing furnace with a new condensing furnace with a minimum efficiency of 96% AFUE.	$ 15,000	N/A	3	N/A	N/A	N/A	297	0.6%	N/A	$ 12	1,304
	Totals	$ 15,000	N/A	3	N/A	N/A	N/A	297	0.6%	N/A	$ 12	1,304
	Interactive Savings Discount @ 10%	N/A	N/A	3	N/A	N/A	N/A	267	0.6%	N/A	$ 10	N/A
	Total Contingency Expenses @ 15%	$ 17,250	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Totals for Improvements	$ 17,250	N/A	3	N/A	N/A	N/A	267	0.6%	N/A	$ 10	1,666

Energy Conservation Measure Options Excluding HVAC

Evaluated Energy Conservation Measures with Savings													
ECM #	Description of ECM	Projected Initial Investment ($)	Natural Gas (Therms)	Propane (gal)	No. 2 Oil (gal)	Steam (ML)	Wood (Tons)	Electricity (kWh)	Energy Savings (kBTU)	% Savings (Energy)	Estimated annual Maintenance Savings	Total Estimated Annual Cost Savings ($)	Simple Payback (Years)
Evaluated Measures													
1	Replace the existing bathroom aerators with new WaterSense certified 1.0 GPM aerators.	$ 10	N/A	N/A	N/A	N/A	N/A	151	517	1.1%	N/A	$ 28	0.36
2	Insulate exposed domestic hot water lines with R-4 or greater insulation.	$ 50	N/A	N/A	N/A	N/A	N/A	170	581	1.2%	N/A	$ 31	1.61

Evaluated Energy Conservation Measures with Savings													
3	Upgrade lighting with ENERGY STAR or DLC certified LED technologies. Please see the lighting tool for specific recommendations.	$ 1,850	N/A	N/A	N/A	N/A	N/A	365	1,245	2.6%	N/A	$ 67	27.76
4	Improve air sealing by reducing the ACH50 rate to 9.5 or lower.	$ 2,320	N/A	12	N/A	N/A	N/A	90	1,447	3.0%	N/A	$ 61	38.25
5	Replace the current single-paned windows with new ENERGY STAR rated double pane windows, minimums U-value .35, minimum SHGC .50.	$ 13,500	N/A	38	N/A	N/A	N/A	542	5,354	11.1%	N/A	$ 235	57.46
6	Install R-11 closed cell insulation to the exterior walls.	$ 13,200	N/A	38	N/A	N/A	N/A	278	4,459	9.2%	N/A	$ 187	70.60
7	Add R-11 fiberglass batt insulation to unframed flooring at the basement ceiling.	$ 10,208	N/A	23	N/A	N/A	N/A	166	2,667	5.5%	N/A	$ 112	91.29
8	Add loose fill roof insulation to the original building roof to achieve a uniform R-49 coverage.	$ 8,352	N/A	15	N/A	N/A	N/A	105	1,692	3.5%	N/A	$ 71	117.73
9	Replace the current DHW heater with a new point of use hot water heater rated at 0.98 EF or higher.	$ 1,200	N/A	N/A	N/A	N/A	N/A	53	182	0.4%	N/A	$ 10	123.02
10	Install a new level two electric vehicle charger.	$ 10,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Totals		$ 60,690	N/A	127	N/A	N/A	N/A	1,922	18,145	37.5%	$ (100)	$ 800	86.64
Interactive Savings Discount @ 10%		N/A	N/A	114	N/A	N/A	N/A	1,730	16,330	33.8%	$ (100)	$ 720	N/A
Total Contingency Expenses @ 15%		$ 69,794	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Totals for Improvements		$ 69,794	N/A	114	N/A	N/A	N/A	1,730	16,330	33.8%	$ (100)	$ 720	112.49

Evaluated Energy Conservation Measures: Financial Impact		
	HVAC Option #1 - Condensing Furnace	**ECM Package Excluding HVAC**
Total Projected Initial ECM Investment	$ 17,250	$ 69,794
Estimated Annual Cost Savings Related to all ECMs	$ 10	$ 720
Estimated Annual Cost Savings- Electricity	N/A	$ 316
Estimated Annual Cost Savings- Propane	$ 10	$ 405
Estimated Annual Cost Savings- Natural Gas	N/A	N/A
Estimated Annual Cost Savings- Fuel Oil	N/A	N/A
Net Effective ECM Payback	1,666 years	112 years
Estimated Annual Energy Savings	1%	34%
Estimated Annual Utility Cost Savings (excluding water)	0%	33%

1.2.4 Measures that Warrant Further Study

The following items are presented for consideration in operational and capital planning:

- No further measures identified.

ENERGY CALCULATIONS AND ASSUMPTIONS

A property energy model was created using spreadsheet calculations based on appropriate and industry-accepted engineering formulas and standards for organizations such as ASHRAE. Nova cost estimates are based on construction cost data from sources such as RS-Means and technical discussions with equipment manufacturers and local contractors. The property owner may wish to solicit competitive bids from qualified contractors to ensure the most accurate pricing. Nova's cost estimates are general industry standards and may not account for all variations and specificities related to this site.

The building's historical energy consumption and the data collected on site were analyzed and "trued-up" in order to create energy models of the building systems. These models were used to predict energy and cost savings for the recommended measures. For this audit, Nova used proprietary spreadsheet models to estimate savings for the proposed retrofits.

Key information on building systems, including the results of performance tests conducted onsite are included in the tables on the following pages.

2.0 PROPERTY OVERVIEW

Facility Schedule	
Building Type/Name	Library
# of Stories	One-story with basement
Year Built/Renovated	1924
Building Size	928 square feet
Hours of Operations/Week	32 hours
Operational Weeks/Year	52 weeks
Estimated Facility Occupancy	Five (5) people

Property Contact	
Point of Contact Name	Ron Bushway
Point of Contact Title	Facilities Manager
Point of Contact - Contact Number	(802) 324-0974

3.0 SITE VISIT

The objective of the Document Review and Interview process is to augment the walk-through survey and to further assist in understanding the Site's latent physical components, physical deficiencies as well as preceding or on-going efforts toward energy and water conservation and/or waste diversion. The information obtained as a result of the Document Review and Interview process is assumed to be true and correct, provided that such information appears to be reasonable.

3.1 Site Visit Information

SITE VISIT INFORMATION	
Date of Site Observation	April 5, 2024
Weather Conditions	Snowing, 34 degrees°F
Nova Field Associate	Johanna Stuz, BPI-BA
Nova Reviewers	Jay Hrivnatz, RA, CEM Keely Felton, CEA Morgan Carson, CEM

3.2 Interviews

PROVISION OF INFORMATION	
	Property Management did not provide us with service provider information as requested in our Pre-Survey Questionnaire.
✔	Property Management did provide us with some information regarding service providers.

Based upon the Pre-Survey Questionnaire and the interview process, the individuals and organizations listed below were contacted and/or interviewed:

INTERVIEWS					
Service Provider/Property Rep.	**Title / Organization**	**Contact Information**	**Contact Attempted**	**Contact Made**	**No Reply / No Response**
Ron Bushway	Facilities Manager, Town of Grand Isle	(802) 324-0974		✔	

4.0 ENERGY AUDIT - HISTORIC UTILITY CONSUMPTION

4.1 Utility Consumption

A preliminary end use analysis was performed on the subject property to understand how the property is using energy, to understand its performance relative to similar properties and to establish baseline GHG Emissions.

4.1.1 Historical Energy Consumption and Costs

Site Utilities	
Facility Electric Service Size	200 AMPS
Onsite Transformer	There is no transformer on-site.
Electric Meter Location	Outside on the southwest corner of the building.

Utility Analysis						
Utility Type	**Utility Provider**	**Meter Quantity**	**Energy/Water Uses**	**Annual Consumption**	**Est./Act.**	**Annual Cost**
Electric (Grid)	Vermont Electric Co-Op	One (1)	Lighting, Well Pump, Water Heating, Air Conditioning, Space Heating, Plug Loads	7,011 kWh	Actual	$1,280 calculated using EIA rate of $0.1826 per gallon
Propane	Delivery; vendor may vary	None	Space Heating	263 Gal	Actual	$592

4.1.2 On-Site Utility Storage

Propane is stored on-site.

Onsite Utility Storage	
Battery Storage	
Storage Capacity	None
Year Installed	N/A
Location Installed	N/A
Space Served	N/A
Fossil Fuel Storage	
No. 2 Oil	None
Propane Gas	Two (2) 120 gallon tanks
Wood Chips/Pellet	None

4.1.3 On-Site Generation

There is no on-site generation.

Solar Rooftop Photovoltaic System	
Installed Capacity	None
Year Installed	N/A
Location Installed	N/A
Space Served	N/A

Emergency Backup Generators	
Generator Capacity	N/A
Year Installed	N/A
Location Installed	N/A
Space served	N/A
Generator Fuel	N/A
Make	N/A

4.1.4 On-site Electric Vehicle Charging

There are no electric vehicle charging stations on-site.

Onsite Electric Vehicle Charging	
Installed Chargers	None
Electrical Charger Type	N/A
Location Installed	N/A
Charger Manufacturer	N/A
Electric Metering to Chargers	N/A
Recommendations	There is sufficient parking for an on-site electric vehicle charger. A service/ panel upgrade would likely be required. A licensed electrical engineer should be consulted to verify.

4.2 Heating Fuel

Nova was provided with three (3) years of propane usage history in Excel format from the property for one (1) owner-paid account. Total consumption and cost were provided. The most recent twelve (12) months of historical data was considered in Nova's analysis.

The following charts show propane consumption totals for the past three (3) years for the whole building and month by month for the period from1/1/2023 to 12/31/2023.

A new heat pump was installed in 2021 and decreased the annual fuel consumption.

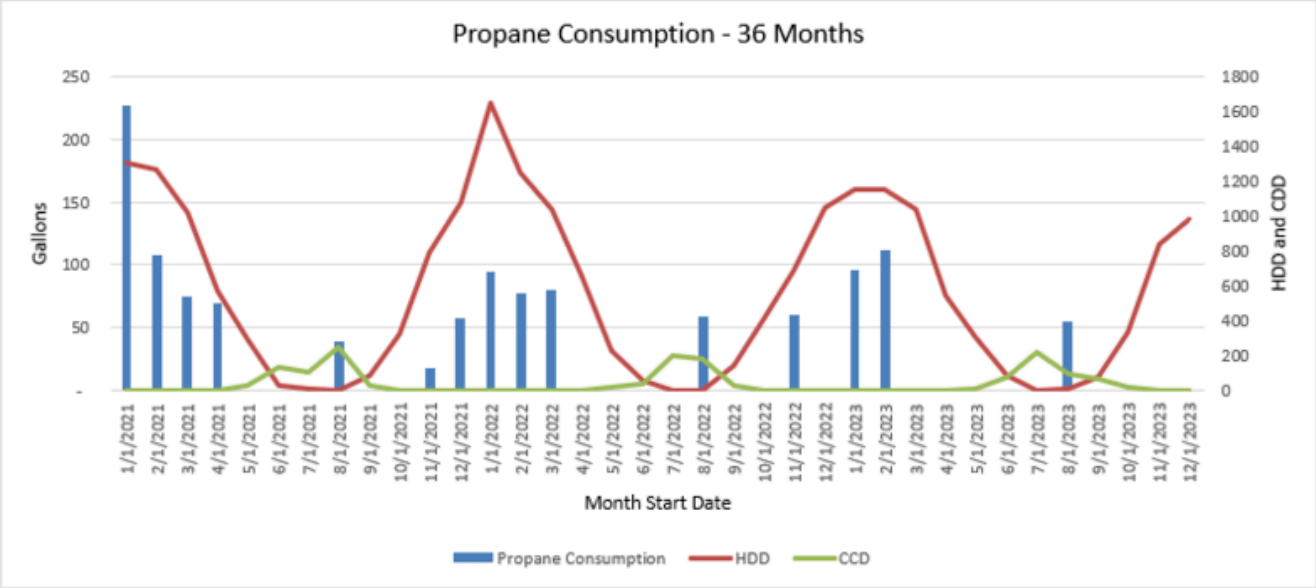
4.2.1 Provision of Data

ANNUAL CONSUMPTION FOR HEATING FUEL					
Start	**End**	**Consumption**	**Cost**	**Estimated**	**Days**
1/1/2021	12/31/2021	591	$1,086	Actual	365
1/1/2022	12/31/2022	370	$811	Actual	365
1/1/2023	12/31/2023	262	$592	Actual	365

PROPANE CONSUMPTION					
Start	**End**	**Consumption (gallons)**	**Cost**	**Estimated?**	**Days**
1/1/2023	1/31/2023	96	$ 217	No	31
2/1/2023	2/28/2023	112	$ 254	No	28
3/1/2023	3/31/2023	-	$ -	No	31
4/1/2023	4/30/2023	-	$ -	No	30
5/1/2023	5/31/2023	-	$ -	No	31
6/1/2023	6/30/2023	-	$ -	No	30
7/1/2023	7/31/2023	-	$ -	No	31
8/1/2023	8/31/2023	54	$ 121	No	31
9/1/2023	9/30/2023	-	$ -	No	30
10/1/2023	10/31/2023	-	$ -	No	31
11/1/2023	11/30/2023	-	$ -	No	30
12/1/2023	12/31/2023	-	$ -	No	31
		263	$ 592		

4.2.2 Analysis

When charted against heating degree days, it is evident that propane consumption peaks during the colder months, likely due to increased heating load.



4.3 Electricity

4.3.1 Provision of Data

Nova was provided with three (3) years of electricity usage history in Excel format from the property for one (1) owner-paid account. Total consumption was provided and costs were estimated using the current EIA rate of $0.1826 per kWh. The most recent twelve (12) months of historical data was considered in Nova's analysis.

The following charts show electricity consumption totals for the past three (3) years for the whole building and month by month for the period from 1/1/2023 to 12/31/2023.

A new heat pump was installed in 2021 and increased the annual fuel consumption.

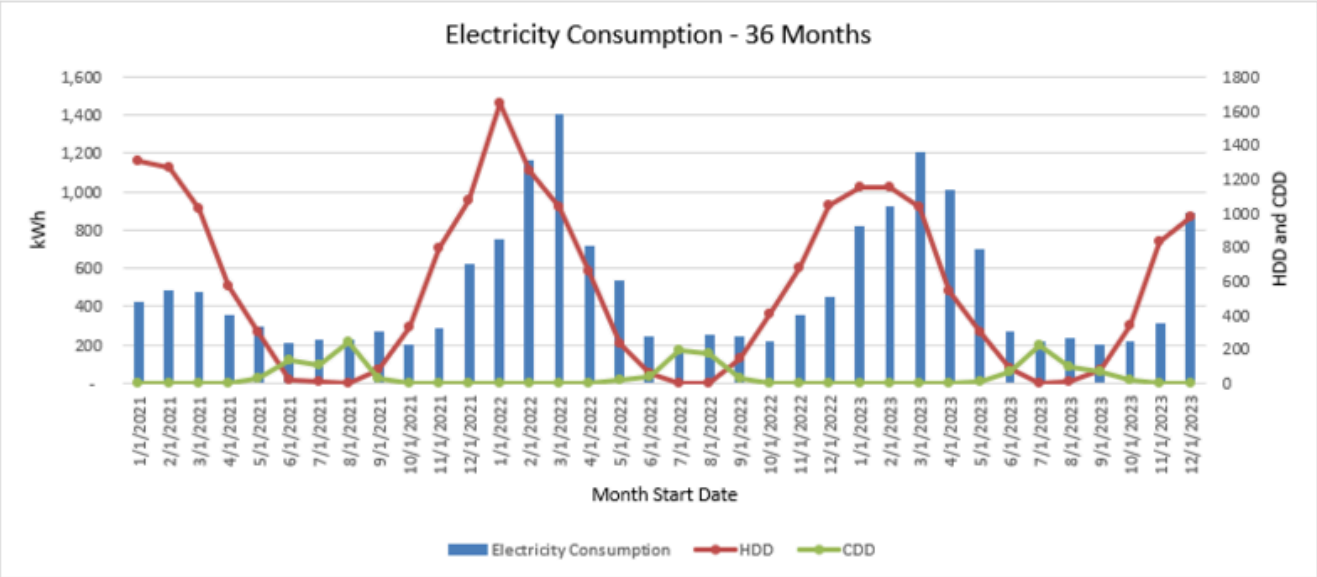
Annual Consumption of Electricity					
Start	**End**	**Consumption**	**Cost (Calculated)**	**Estimated**	**Days**
1/1/2021	12/31/2021	4,093	$747	Actual	365
1/1/2022	12/31/2022	6,527	$1,192	Actual	365
1/1/2023	12/31/2023	7,011	$1,280	Actual	365

ELECTRICITY CONSUMPTION					
Start	**End**	**Consumption (kWh)**	**Cost**	**Estimated?**	**Days**
1/1/2023	1/31/2023	823	$ 150	No	31
2/1/2023	2/28/2023	927	$ 169	No	28
3/1/2023	3/31/2023	1,206	$ 220	No	31
4/1/2023	4/30/2023	1,006	$ 184	No	30

ELECTRICITY CONSUMPTION					
Start	**End**	**Consumption (kWh)**	**Cost**	**Estimated?**	**Days**
5/1/2023	5/31/2023	701	$ 128	No	31
6/1/2023	6/30/2023	268	$ 49	No	30
7/1/2023	7/31/2023	220	$ 40	No	31
8/1/2023	8/31/2023	238	$ 43	No	31
9/1/2023	9/30/2023	200	$ 37	No	30
10/1/2023	10/31/2023	220	$ 40	No	31
11/1/2023	11/30/2023	316	$ 58	No	30
12/1/2023	12/31/2023	886	$ 162	No	31
		7,011	$ 1,280		

4.3.1.1 Analysis

When charted against heating degree days, it is evident that electric consumption peaks during the colder months, likely due to increased heating load.



4.3.1.2 Renewable (Green Power) Energy Sources

No renewables or energy generation systems were observed on site.

4.4 Utility Rate Structure Analysis

Rates for common area utilities were provided on the utility tariff for each utility.

UTILITY RATE STRUCTURE ANALYSIS						
Service	**Utility**	**Rate**	**Service/Customer Charge**	**Demand Charge**	**EIA Rate**	**Rate Used In Calculation**
Electricity	Vermont Electric Co Op	$0.18049 per kWh up to 15,000 kWh and $0.10330 per kWh over 15,000 kWh	Customer Charge: $20.81 per meter up to 15,000 kWh and $34.69 per meter over 15,000 kWh.	$23.79 kW demand over 15,000 kWh	$0.1826 per kWh	$0.18049 per kWh
Propane	Delivery company varries	Rates vary	NA	No	$3.548 per gallon	$3.548 per gallon

4.4.1 Billing Irregularities

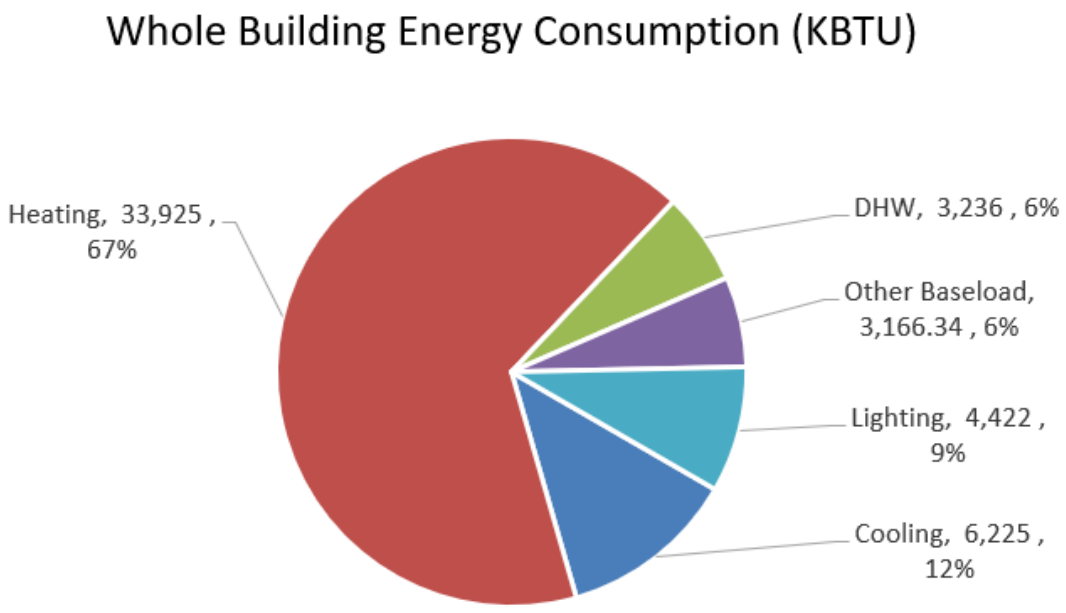
No billing irregularities were identified during the analysis of the utility data.

4.5 Utility End Use Analysis

Utility end use at the subject property was observed to be consistent with similar real estate assets previously analyzed by Nova Group, GBC.

4.5.1 End Use Breakdown

The figure below shows an annual breakdown of energy consumption for the entire facility.



5.0 EXISTING SYSTEMS AND EQUIPMENT - ENERGY

5.1 Existing Conditions

This section includes an inventory of existing systems and equipment and their current conditions.

Detailed equipment tables are included in Exhibit C of this report.

5.2 Building Envelope

The foundation is made of poured reinforced walls. Up to 50% of the basement is a full story height basement with exposed concrete floor and the rest is dirt crawlspace covered with a vapor barrier. The poured concrete walls extend over one foot above grade. The brick walls and wood floor joists rest on the concrete foundation walls. The interior walls surface are finished but not insulated. The finished flat ceiling is insulated with R-19 fiberglass batts. The wood framed hip roof attic has no visible ventilation. The chimney fireplace is blocked by not sealed.

5.2.1 Structure

The foundation is a reinforced concrete below grade walls for the basement and crawlspace. The above grade walls are brick. The wood framed hip roof is built on the brick walls.

STRUCTURE	
Component	**Description**
Construction Drawings	Construction drawings were not made available for review
Foundation Type	Building foundations appear to be unfinished basements
Wall Type and Framing	The superstructure appears to be conventional wood stud framing.
Upper Floor Framing	There is no upper floor.
Exterior Facade Description	Facades are finished with brick.
Wall Insulation Verification	Absence of wall insulation was verified via IR images.
Roof Type	Buildings on site are constructed with hip roofs
Roof Framing	Roof framing consists of wood trusses, supporting plywood or OSB roof sheathing.
Roofing Material	Building sloped roofs are asphalt shingle, black or dark brown with conventional pigments.
Median Roof Age	Unknown; appears in good condition
Roofing Reflectance	0.04-0.15, which is not considered reflective
Roof Water Intrusion	No evidence of active roof leaks was reported or observed.
Roof Insulation Verification	Insulation was verified visually.

ENVELOPE INSULATION			
Slab	**Basement Walls**	**Above Grade Walls**	**Roof/Attic**
No Insulation	No Insulation	No Insulation	5.5" Fiberglass Batt, R-19

DOORS AND WINDOWS	
Component	**Description**
Windows	
Window Frame	Windows are wood framed.
Window Operation	Windows are single-hung units.
Window Glazing	Windows are single-glazed. There are also storm windows present.
Window Weatherstripping	Weather stripping does not appear to provide an adequate air seal to the exterior.
Window Age	Windows appear to be original to the property.
Window Center of Glass (COG) Values	U-Factor .7 SHGC .9
Window Tint/Films	Windows are not tinted.
Window to Wall Ratio	12.6% (1,170 square feet of exterior wall surface area; 147 square feet of window surface area)
Doors	
Main Entry Doors	Entry doors are wood doors in wood frames.
Door Weatherstripping	Weather stripping does not appear to provide an adequate air seal to the exterior.
Door Age	Doors appear to be original to the property.
Overhead Doors	There are no overhead doors.

Blower Door Testing	
Blower Door Equipment	Retrotec
Building Volume	8,352 cubic feet
Leakage Rate @ -50 Pa (CFM50)	1,480 CFM50
Leakage Rate ACHN50	10.6 ACH50
Noted areas of infiltration	Air infiltration was seen at the window trim, chimney, the vault room window, front door trim, the pocket door frame, windows around the front door, the attic access, the trap door to the basement, and the ceiling in the south entry foyer.

Infrared Imaging	
Infrared Equipment	Flir One Pro
Outdoor temperature	34 degrees F
Indoor space temperature	70 degrees F
Infrared Comments	Heat loss was seen at the attic hatch, chimney, uninsulated walls, top plates, bottom plates, floor rim joists and the basement floor and walls.

5.3 Heating, Ventilation and Air Conditioning (HVAC)

Heating is provided by a ducted furnace during the winter months. A heat pump provides heat during the spring and fall and cooling during the summer months. There is an ceiling mounted exhaust fan in the restroom. The old window PTAC is stored in the basement. The basement has a radon reduction system with the exhaust fan located outside the East wall.

5.3.1 Heating

The ducted forced air propane fired furnace is located in the basement. The uninsulated supply and return ducts vent through the floor.

HEATING SYSTEM SUMMARY		
Area Served	Entire Building (Winter)	Entire Building (Spring and Fall)
Heating System Type	Furnace	Air Source Heat Pump - Ductless
Heating Fuel	Propane	Electricity
Heating System Configuration	Ducted	Ductless
Heating Equipment Location	Basement	Exterior Heat Pump and Interior Fan Coils
Typical Range of Efficiency	93% AFUE	13.3 HSPF
Equipment Manufacture Date Range	2006	2021
Quantity	One (1)	One (1)
Access Issues	None	None
Description of Variation in Type, Fuel, Configuration or Location Between Areas	N/A	N/A

COMMERCIAL HEATING EQUIPMENT - PROPERTY WIDE	
Sample Representation	100% of systems on site were observed as part of the sample.
Explanation of Discrepancy	None
Heating Systems Recommended for Replacement	The gas furnace heating system.
Reason for Replacement	Equipment is approaching or has exceeded its EUL, and efficiency could be improved to achieve savings goals

5.3.2 Cooling

The facility is cooled by a mini-split heat pump.

COOLING SYSTEM SUMMARY	
Area Served	Entire Building
Cooling System Type	Air Source Heat Pump - Ductless
Cooling System Configuration	One (1) to One (1)
Cooling Equipment Location	Inside/Outside

COOLING SYSTEM SUMMARY	
Typical Range of Efficiency	25.3 SEER
Equipment Manufacture Date Range	2021
Quantity	One (1)
Access Issues	None
Description of Variation in Type, Fuel, Configuration or Location Between Areas	N/A

COMMERCIAL COOLING EQUIPMENT - PROPERTY WIDE	
Sample Representation	100% of systems on site were observed as part of the sample.
Explanation of Discrepancy	None
Cooling Systems Recommended for Replacement	None
Reason for Replacement	N/A

5.3.3 Distribution, Controls and Ventilation

Heat distribution is ducted, air conditioning is point source. Thermostats are programmable.

DISTRIBUTION & CONTROLS	
Ducted Distribution	
HVAC Duct Location	HVAC ducts are exposed in basement areas
Access HVAC to Ductwork	Approximately 80% of ductwork is accessible from the basement.
HVAC Ductwork Air Sealing	Where exposed, ductwork appeared to be poorly air-sealed, based on visual inspection.
HVAC Duct Insulation	Most observed ductwork was uninsulated.
Affected Systems	Heating
HVAC Blower Fan Motors	
Type of Blower Fan Motors	Multi-Speed
Hydronic or Steam Distribution	
Type of Distribution	N/A
Hydronic or Steam Pipe Insulation	N/A
Affected Systems	N/A
Controls	
Leased Area Thermostats	There are no leased areas.
Common Area Thermostats	Programmable
Building Automation System	N/A
Heating Setpoints	70 degrees F
Cooling Setpoints	70 degrees F
Opportunity for Improvement	None

VENTILATION	
Kitchen Ventilation Type	There is no kitchen.
Kitchen Exhaust Destination	N/A

VENTILATION	
Bathroom Ventilation Type	Mechanical exhaust fans - individual
Bathroom Exhaust Destination	Vented to the exterior.

5.4 Domestic Water Heating

5.4.1 DHW Equipment

One (1) electric, six (6) gallon water heater serves the entire building.

DOMESTIC HOT WATER SYSTEM SUMMARY	
Area Served	Entire Building
DHW System Type	Tank - Direct
DHW Fuel	Electricity
DHW System Capacities	Six (6) gallons; 1,650W
DHW Equipment Location	Basement
Typical Range of Efficiency	0.92 EF
Equipment Manufacture Date Range	2017
Quantity	One (1)
Access Issues	None
DHW Lines	Domestic hot water piping was observed to be uninsulated where exposed.
Is a re-circ pump installed?	None
Existing High Rise Water Pressure Boosting System	No
Are Existing Booster(s) Variable Speed?	N/A
Description of Water Fixtures Related to DHW Usage (Faucet Aerators and Showerheads)	One (1) toilet and one (1) faucet
Description of Variation in Type, Fuel, Configuration or Location Between Areas	N/A

DHW EQUIPMENT - PROPERTY WIDE	
Sample Representation	100% of systems on site were observed as part of the sample.
Explanation of Discrepancy	None
DHW Systems Recommended for Replacement	The single DHW system in the building.
Reason for Replacement	Equipment is approaching or has exceeded its EUL, and efficiency could be improved to achieve savings goals

WATER FIXTURES - SUMMARY					
Fixture Type	**Location**	**Range Rated Flow Rate (GPM or GPF)**	**Average Rated Flow Rate (GPM or GPF)**	**Qty**	**% of Sample**
Toilet	Restroom	1.6 GPF	1.6 GPF	One (1)	100%
Faucet	Restroom	2.2 GPM	2.2 GPM	One (1)	100%

5.5 Lighting

5.5.1 Interior Lighting

Linear fluorescent light fixtures containing 32W T8 bulbs provide most interior lighting in the building. There are also two (2) Edison socket fixtures with LED 9W bulbs and one (1) Edison socket fixtures with a 13W CFL bulb.

The facility doesn't have any automatic lighting controls on internal light fixtures**.**

Interior Lighting			
Fixture Types	**Wattage**	**% of Total Fixtures**	**Recommended for Replacement**
T-8 Fluorescent	32 W	80%	Yes
CFL	13 W	7%	Yes
LED	9 W	13%	No

5.5.2 Exterior Site Lighting

The exterior lighting primarily consists entirely of LED fixtures with 16W lamps.

Exterior Lighting Lighting			
Fixture Types	**Wattage**	**% of Total Fixtures**	**Recommended for Replacement**
LED	16 W	100%	No

5.6 Appliances

5.6.1 Kitchen Appliances

Breakroom Appliances			
Item	**Type**	**Estimated Age & Condition**	**ENERGY STAR Certified**
Refrigerator	1.7 cubic feet Freezer location: Top Manufacturer/s: Galanz Estimated Annual Consumption: 200 KWh	Eight (8) years old and in fair condition.	ENERGY STAR Rated

REFRIGERATORS - PROPERTY WIDE	
Sample Representation	100% of appliances on site were observed as part of the sample.
Explanation of Discrepancy	None
Refrigerators Recommended for Replacement	None
Reason for Replacement	N/A

5.6.2 Laundry

No laundry equipment or hookups were observed on site.

5.7 Process Equipment and Loads

No process equipment was observed on site.

5.8 Other Systems

No other systems were noted on site as significant energy-consumers.

5.9 Onsite Energy Generation

5.9.1 Solar Energy & Cogeneration

The property has significant potential for a solar photovoltaic (PV) system, with a large unshaded pitched roof area with minimal mechanical equipment, and a significant electric baseload throughout the year.

The roof warranty for the property was requested, but not received as of the date this report was issued. The site contact was not able to provide a verbal estimate of the time remaining on the warranty.

There is currently no on-site energy generation at the Property.

The property has significant potential for a solar photovoltaic (PV) system, with a large unshaded pitched roof area with minimal mechanical equipment.

Nova bases solar sizing calculations on the following considerations:

1. Maximize available roof space
2. Only use the orientations that will be the most profitable (aiming for <15 year paybacks)
3. Offset more than 100% of owner paid electricity after factoring in the kWh reduction of the recommended ECMs. The 100% value helps ensure that the property is more likely to over-produce electricity during cyclical periods of lower electricity consumption throughout the year to feed battery storage system.
4. Any additional electricity produced will be fed back into the grid for net metering credits.

6.0 RECOMMENDED ENERGY CONSERVATION MEASURES (ECMS)

6.1 Building Envelope

ECM: IMPROVE AIR SEALING

Green Alternative	Engage a BPI-accredited air sealing contractor to reduce air leakage by an estimated 9.5 ACH50. Recommended areas of focus include penetrations and transitions between the attic and ceiling, as well as penetrations through exterior walls. Electrical outlets on exterior walls should be sealed with foam gaskets. Attic hatches should be sealed with weather stripping and insulated with rigid foam. Exterior door weather stripping should be replaced as needed.
Benefits Attained	Air sealing reduces heat loss in the winter and heat gain in the summer. Air sealing can reduce the risk of fire, and stop interior moisture from reaching attics. Comfort may improve as the air sealing reduces the transfer of odors, noise and animal pests between different parts of the building.
Assumptions	The ACH50 rate is estimated to be 10.6 based on blower door testing.
Recommendation	This "green alternative" is not considered cost-effective for early replacement but is recommended as the replacement option when the equipment is replaced based on capital need.

ECM: IMPROVE ATTIC INSULATION

Green Alternative	Nova recommends adding blown-in insulation to the attic space to total R-49. Before adding the insulation, we recommend air sealing. Site staff should confirm that the roof is in good condition and is leak-free prior to insulation work. Larger openings, such as chases, shall be sealed with rigid foam board or sheet metal. Before insulation is installed, dams should be built around access hatches, chimney flues, and open ventilation shafts. Blocking should be installed around soffit vents to ensure adequate air flow while preventing 'wind washing' through the insulation near the eaves.
Benefits Attained	Improved roof insulation reduces heat loss in the winter and heat gain in the summer.
Assumptions	The following assumptions were made to calculate savings from the proposed roof insulation: › The existing R value of the attic was considered to be R-19 based on visual inspection.
Recommendation	This "green alternative" is not considered cost-effective for early replacement but is recommended as the replacement option when the equipment is replaced based on capital need.

ECM: EXTERIOR WALL INSULATION

Green Alternative	Nova recommends installing R-11 closed cell insulation to the exterior walls. Select an insulation material that will not be damaged by moisture such as closed cell spray foam, rigid foam, or mineral wool. Ensure that humidity levels are <60% to avoid moisture-related issues such as mold or rot. Larger openings, such as chases, shall be sealed with rigid foam board or sheet metal. Ensure that any foam insulation is covered with a fire-rated rated barrier if required per local building code.
Benefits Attained	Improved wall insulation reduces heat loss in the winter and lessens the impact of poor distribution efficiency from heating and cooling systems located in these areas.
Assumptions	The following assumptions were made to calculate savings from the proposed roof insulation: › The existing R value of the walls was considered to be R-2 based on visual inspection
Recommendation	This "green alternative" is not considered cost-effective for early replacement but is recommended as the replacement option when the equipment is replaced based on capital need.

ECM: REPLACE WINDOWS

Green Alternative	Nova recommends replacing existing single-pane windows with new, high-efficiency ENERGY STAR® certified units. Select window units that are appropriate for this climate zone in order to optimize heating and cooling savings. Air seal the rough opening around each unit during install with low-expanding foam. Flash each unit appropriately to prevent water damage.
Benefits Attained	Replacing windows is an expensive measure, and the utility savings associated with this improvement is not enough to fully offset the install cost. However, many of the window units will need replacement in the coming years as they are reaching the end of their useful life. Replacing now with high efficiency alternatives provides significant cost savings and comfort benefits and reduces large future capital expense.
Assumptions	The following assumptions were made to calculate savings from the proposed window: › The existing windows are modeled with a u-value of .7 and a SHGC of .9. › New windows are modeled with a u-value of 0.35 and a SHGC of 0.35. › Air leakage is estimated to be reduced by 5% by replacing windows.
Recommendation	This "green alternative" is not considered cost-effective for early replacement but is recommended as the replacement option when the equipment is replaced based on capital need.

ECM: FRAMED FLOOR INSULATION

Green Alternative	Nova recommends adding R-11 fiberglass batt insulation to unframed flooring at the basement ceiling. Site staff should confirm that the foundation is in good condition and is leak-free prior to insulation work. Ensure that humidity levels are <60% to avoid moisture-related issues such as mold or rot. Larger openings, such as chases, shall be sealed with rigid foam board or sheet metal. Ensure that any foam insulation is covered with a fire-rated rated barrier if required per local building code.
Benefits Attained	Improved foundation insulation reduces heat loss in the winter and lessens the impact of poor distribution efficiency from heating and cooling systems located in these areas.
Assumptions	The following assumptions were made to calculate savings from the proposed roof insulation: › The existing R value of the foundation was considered to be R-2 based on visual inspection
Recommendation	This "green alternative" is not considered cost-effective for early replacement but is recommended as the replacement option when the equipment is replaced based on capital need.

6.2 HVAC Systems

ECM: INSTALL HIGH EFFICIENCY FURNACES

Green Alternative	Install high efficiency, ENERGY STAR® rated condensing furnace rated at 95% AFUE or higher.
Benefits Attained	While replacing heating units is an expensive measure, many of the units will need replacement in the coming years as they are reaching the end of their useful life. Replacing now with high efficiency alternatives provides significant cost savings and comfort benefits and reduces large future capital expense.
Assumptions	We modeled the savings using spreadsheet-based calculations. To calculate heating savings we assumed an improvement in efficiency from 93% to 95% AFUE. In determining feasible exterior wall vent locations, proximity to windows, doors and walkways should be considered. Venting for this type of system is pressurized and cannot be vented into a chimney which is utilized by atmospherically vented appliances. If vented into an existing chimney, positive pressure venting should be extended to the building exterior. Local codes and manufacturer's specifications should always be consulted to ensure feasibility, legality, and safety.
Recommendation	This “green alternative” is not considered cost-effective for early replacement but is recommended as the replacement option when the equipment is replaced based on capital need.

6.3 Domestic Water Systems

ECM: INSULATE DOMESTIC HOT WATER PIPING

Green Alternative	Nova recommends insulating all exposed hot water piping and the first three (3) feet of exposed cold water piping to R4. Installer to ensure compliance with all applicable codes.
Benefits Attained	Exposed pipes in unconditioned spaces are a significant cause of heat loss from domestic hot water systems. Moreover, when their surface temperature exceeds 100 degrees F, they present a health and safety liability. Insulating these pipes will reduce energy consumption by reducing the heat loss through uninsulated piping.
Assumptions	We modeled the savings using spread-sheet based calculations.
Recommendation	This "green alternative" is considered cost-effective for early replacement and is recommended.

ECM: INSTALL HIGHER EFFICIENCY ELECTRIC WATER HEATERS

Green Alternative	Replace the existing electric water heater with a higher efficiency point-of-use electric water heater rated at 0.98 EF or higher.
Benefits Attained	While replacing domestic hot water units is an expensive measure, the existing unit will need replacement in the coming years as it reaches the end of its useful life. Replacing now with high efficiency alternatives provides significant cost savings and comfort benefits and reduces large future capital expense.
Assumptions	We modeled the savings using spreadsheet-based calculations. To calculate domestic hot water savings we assumed an improvement in efficiency from 0.92 to 0.98 EF.
Recommendation	This "green alternative" is not considered cost-effective for early replacement but is recommended as the replacement option when the equipment is replaced based on capital need.

6.4 Lighting Systems

ECM: UPGRADE COMMON AREA LIGHTING

Green Alternative	Nova recommends the following: › Retrofit existing compact and linear-fluorescent technology fixtures with LED technology lamps. › For fluorescent lamps, management should consider replacing the existing ballasts with LED drivers. › Existing LEDs lamps and fixtures to remain in place. › Property staff shall be trained on the operation and maintenance of the new high-efficiency lighting system.
Benefits Attained	Installing high-efficiency lighting will significantly reduce the property's electrical consumption while maintaining equivalent or better light levels. Also, many of the recommended bulbs and fixtures have longer lifespans. This measure will reduce the number of bulbs replaced at the property as well as maintenance costs.
Assumptions	We modeled the savings using spreadsheet-based calculations. We based light runtime hours on observations from our site visit and on discussions with property staff and residents.
Recommendation	This "green alternative" is not considered cost-effective for early replacement but is recommended as the replacement option when the equipment is replaced based on capital need.

6.5 Resilience Options

ECM: INSTALL SOLAR PHOTOVOLTAIC SYSTEM

Green Alternative	We analyzed the property for a potential solar PV system based on available roof space, and found the property may be a good candidate for up to 6.29 kW of installed solar capacity. A complete solar evaluation and design by a qualified contractor should be completed as part of this work scope.
Benefits Attained	By cleanly generating electricity onsite, a solar electric system would significantly reduce the property's utility electric purchase, eliminating associated carbon emissions, and reduce the property's exposure to future electric price swings. A PV system could also be paired with onsite battery storage to provide additional resilience in the case of an extended blackout (for additional cost and design considerations).
Assumptions	The solar PV system feasibility and size was assessed given available roof space, pitch and orientation and typical electricity production We modeled this EWEM using PVWatts calculator: http://pvwatts.nrel.gov/
Recommendation	This "green alternative" is recommended for decarbonization and resiliency reasons.

ECM: REPLACE SECTION OF ROOF FOR PHOTOVOLTAIC INSTALLATION

Green Alternative	Based on the age of the current roofing systems, if a photovoltaic system is installed, it is suggested that prior to work starting the affected roof section be re-roofed. This recommendation must be selected in conjunction with the solar PV ECM.
Benefits Attained	Since roofing will likely need to be replaced within the next 25 years (the expected useful life of a photovoltaic system), re-roofing now will save costly removal and re-installation fees and prevent solar credit losses from down-time that the system is not producing during future re-roofing.
Assumptions	Nova estimates that based on the optimal location and size of the photovoltaic system that approximately 1,100 square feet of roof space be replaced with a solar-viable roofing material.
Recommendation	This "green alternative" is recommended for decarbonization and resiliency reasons.

ECM: LEVEL TWO ELECTRIC VEHICLE CHARGER

Green Alternative	We analyzed the property for a potential electric vehicle charging station based on available parking space, and found the property has availability for one (1) charging station.
Benefits Attained	By providing onsite electric charging station, the site will promote the use of EV chargers in the area, reducing vehicle emissions in the area. Additionally, the chargers will likely increase foot traffic in the area, providing economic benefits to the town.
Assumptions	The charger installed would be a level two (2) electric vehicle charger.
Recommendation	This "green alternative" is recommended for decarbonization and resiliency reasons.

7.0 GLOSSARY OF ABBREVIATIONS

This report may use abbreviations to describe various site or building system components. Not all abbreviations may be applicable to this report. Frequently used abbreviations are listed and defined below.

ABBREVIATIONS			
Acronym	**Description**	**Acronym**	**Description**
AC	Air Conditioner	HRV	Heat-Recovery Ventilator
ACH	Air Changes per Hour	HSPF	Heating Seasonal Performance Factor
ACH50	Air Changes per Hour at 50 Pascals Building Pressure	HUD	U.S. Department of Housing and Urban Development
ACHN	Natural Air Changes per Hour	HVAC	Heating, Ventilation and Air Conditioning
AEE	Association of Energy Engineers	HWS	Hot Water Supply
AFUE	Annual Fuel Utilization Efficiency	IAQ	Indoor Air Quality
AHU	Air Handling Unit	IBC	International Building Code
ANSI	American National Standards Institute	IECC	International Energy Conservation Code
ASHP	Air Source Heat Pump	IES	Illuminating Engineering Society of North America
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers	IMEF	Integrated Modified Energy Factor
ASTM	American Society for Testing and Materials	IPLV	Integrated Part Load Value
BEAP	Building Energy Assessment Professional (ASHRAE)	ISO	Polyisocyanurate
BESA	Building Energy Simulation Analyst (Association of Energy Engineers)	IWF	Integrated Water Factor
BMS	Building Management System	kBTU	One Thousand British Thermal Units
BPI	Building Performance Institute	kW	Kilowatt
BPI-BA	Building Performance Institute Certified Building Analyst	kWh	Kilowatt-Hour
BPI-MFBA	Building Performance Institute Certified Multifamily Building Analyst	LED	Light Emitting Diode
BTL	Building Tightness Limit	LEED	Leadership in Energy and Environmental Design
BTU	British Thermal Unit	LEED AP(BD&C)	LEED Accredited Professional - Building Design & Construction
BTUH	British Thermal Units per Hour	Low-E	Low Emissivity
CAZ	Combustion Air Zone	LPG/LP Gas	Liquefied Petrolium Gas (ex - Propane)
CDD	Cooling Degree Days	MAU	Makeup Air Unit
CEA	Certified Energy Auditor (Association of Energy Engineers)	MEF	Modified Energy Factor
CEC	California Energy Commission	MEP	Mechanical, Electrical and Plumbing
CEER	Combined Energy Efficiency Ratio	MH	Metal Halide

ABBREVIATIONS			
Acronym	**Description**	**Acronym**	**Description**
CEF	Combined Energy Factor	MMBTU	One Million British Thermal Units
CEM	Certified Energy Manager (Association of Energy Engineers)	MTCO2e	Metric Tons Carbon Dioxide Equivalent
CF	Cubic Feet	MVG	Minimum Ventilation Guideline
CFL	Compact Fluorescent Lamp	MVL	Minimum Ventilation Level
CFM	Cubic Feet per Minute	NABCEP	North American Board of Certified Energy Practitioners
CFM50	Measured Air Flow through Blower Door at 50 Pascals	NAHB	National Association of Home Builders
CMVP	Certified Measurement & Verification Professional (Association of Energy Engineers)	NFPA	National Fire Protection Association
CO	Carbon Monoxide	NFRC	National Fenestration Rating Council
CO2	Carbon Dioxide	NRA	Net Rentable Area
CO2e	Carbon Dioxide Equivalent	NREL	National Renewable Energy Laboratory
COP	Coefficient of Performance	NRSF	Net Rentable Square Feet
CPVC	Chlorinated Polyvinyl Chloride	ODS	Oxygen Depletion Sensor
CRI	Color-Rendering Index	OSB	Oriented Strand Board
CUFT	Cubic Feet	OSHA	Occupational Safety and Health Administration
DB	Dry-Bulb (Temperature)	PCA	Property Condition Assessment
DHW	Domestic Hot Water	PCR	Property Condition Report
DLC	DesignLights Consortium	PPM	Parts per Million
DWH	Domestic Water Heater	PSC	Permanent Split Capacitor
DX	Direct Expansion	PSI	Pounds per Square Inch
ECM	Electronically Commutated Motor	PTAC	Packaged Terminal Air Conditioner
EER	Energy Efficiency Ratio	PTHP	Packaged Terminal Heat Pump
EF	Energy Factor	PVC	Polyvinyl Chloride
EIFS	Exterior Insulation and Finish System	R-	R-Value
EMF	Electro Magnetic Field	RAC	Room Air Conditioner
EMS	Energy Management System	RESNET	Residential Energy Services Network
EPA	Environmental Protection Agency	RPM	Revolutions per Minute
EPDM	Ethylene Propylene Diene Monomer	RTU	Rooftop Unit
EPS	Expanded Polystyrene	RUL	Remaining Useful Life
ERV	Energy-Recovery Ventilator	R-Value	Thermal Resistance
EUI	Energy Use Intensity	SC	Shading Coefficient
EUL	Expected Useful Life	SEER	Seasonal Energy Efficiency Ratio
EWEM	Energy and Water Efficiency Measure	SF	Square Feet
FCU	Fan Coil Unit	SHGC	Solar Heat-Gain Coefficient
FHA	Forced Hot Air	SIR	Savings to Investment Ratio
FHR	First Hour Rating	SOG	Slab on Grade
FHW	Forced Hot Water	TE	Thermal Efficiency

ABBREVIATIONS			
Acronym	**Description**	**Acronym**	**Description**
FPM	Feet per Minute	TPO	Thermoplastic Polyolefin
FT	Feet	TRV	Thermostatic Regulator Valve
GA	Gross Area	TTD	Thermostatic Tub Diverter
gal	Gallons	U-	U-Factor (U-Value)
GBA	Gross Building Area	UBC	Uniform Building Code
GFCI	Ground Fault Circuit Interrupter	UL	Underwriters Labaratories
GPC	Gallons per Cycle	USGBC	U.S. Green Buildung Council
GPF	Gallons per Flush	UV	Ultraviolet
GPM	Gallons per Minute	V	Volt
GSHP	Ground Source Heat Pump	VAV	Variable Air Volume
HDD	Heating Degree Days	VFD	Variable Frequency Drive
HERS	Home Energy Rating System	VOC	Volatile Organic Compound
HHW	Heating Hot Water	W	Watt
HID	High-Intensity Discharge (Lighting)	WB	Wet-Bulb (Temperature)
HP	Horsepower	WH	Watt-hour
HPB	High Performance Building	WRT	With Reference to
HPBD	High-Performance Building Design Professional (ASHRAE)	WUI	Water Use Intensity
HPS	High-Pressure Sodium	XPS	Extruded Polystyrene

8.0 RECOMMENDED OPERATIONS AND MAINTENACE PLAN

BEST PRACTICES TO IMPROVE ENERGY PERFORMANCE

LOW-COST O&M CHECKLIST

Use the following checklist of low-cost O&M practice to identify opportunities, assign responsibility and track progress toward goals at your facility.

	Opportunity Exists	Target Reduction	Who is Responsible?	Target Date to Complete	Actual Date Completed	Notes
OPERATIONS & MAINTENANCE						
Ensure all equipment is functioning as designed	Y					
Calibrate thermostats	Y					
Adjust dampers	Y					
Implement janitorial best practices	Y					
Properly maintain existing equipment	Y					
Review ENERGY STAR Registry of Labeled Buildings for ideas	Y					
OCCUPANTS' BEHAVIOR						
Turn off equipment	Y					
Institute an energy awareness program	Y					
Adopt a procurement policy for ENERGY STAR qualified equipment	Y					
Maximize use of daylight	Y					
Install task lighting	Y					
Train staff	Y					
LIGHTING						
Change incandescents to CFLs	Y					
Change T12s to T8 or T5	Y					
Install occupancy sensors in back-of-the house, infrequently used areas						
Install high efficiency LED exit signs						
Periodically clean the bulbs with a dry cloth	Y					
De-lamp where illumination is excessive	Y					
Only use lights that are needed	Y					

www.energystar.gov/benchmark

E-mail: energystarbuildings@epa.gov

	Opportunity Exists?	Target Reduction	Who is Responsible?	Target Date to Complete	Actual Date Completed	Notes
KITCHENS						
Pre-heat ovens no more than 15 minutes prior to use						
Keep refrigerator coils clean and free of obstructions	Y					
Bleach clean with warm water	Y					
Use fan hood only when cooking						
Purchase ENERGY STAR commercial cooking equipment	Y					
COMPUTERS AND OFFICE EQUIPMENT						
Utilize power down feature on computers	Y					
Purchase ENERGY STAR office equipment	Y					
Install energy control devices on vending machines						
HVAC AND PLANT SYSTEMS						
Adjust thermostats for seasonal changes and occupancy	Y					
Balance air and water systems	Y					
Replace boiler burners	Y					
Unblock air flow from unit ventilators	Y					
Clean centrifugal chiller water tubes						
Clean and repair chilled water plants or package units						
Repair leaking steam traps						
Repair pipe and vessel insulation from steam and hot water distribution lines						
Repair malfunctioning dampers on unit ventilators						
Chemically treat feedwater						
Annually test combustion efficiency	Y					
Clean and lubricate moveable surfaces and check actuator movement and set-points in the damper and economizer						
Perform boiler tune-ups	Y					
Clean filters and fans	Y					
Clean air conditional evaporator and condenser coil fins	Y					
Align and adjust belts	Y					

	Opportunity Exists?	Target Reduction	Who is Responsible?	Target Date to Complete	Actual Date Completed	Notes
HVAC AND PLANT SYSTEMS (CONTINUED)						
Check for air leaks in equipment cabinets and ducts						
Ensure proper operation of air damper	Y					
Clean condenser and evaporator coils	Y					
Properly charge refrigerant	Y					
Install VFDs and energy efficient motors	Y					
FANS						
Clean fan blades	Y					
Inspect bearings	Y					
Adjust/change belts	Y					
Check fan current	Y					
BUILDING ENVELOPE						
Regularly inspect doors and windows for air leaks	Y					
Periodically inspect building for water leaks	Y					
Check the caulking and weather stripping for leaks	Y					
WATER HEATING						
Adjust water temperature to lower legal limit	Y					
Periodically check the hot water systems for leaks	Y					
Test the burners of gas or oil fired water heaters annually	Y					
Periodically flush fixtures to prevent bacteria growth	Y					
Annually flush storage-type hot water tanks	Y					
Periodic maintenance on the hot water system	Y					
Install or repair pipe insulation	Y					

EXHIBIT A: PHOTOGRAPHIC RECORD

Photographs

Elevation South; Main Entry Faces the Street

Elevation East

Elevation North

Elevation West

South Walls and Main Entry

South Wall Main Entry Door

Window

Storm Windows

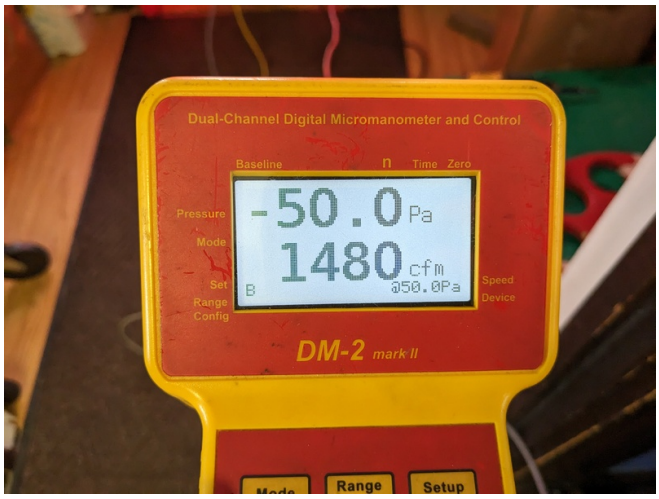
Pocket Door

Window Sealed with Putty

Drafty Window

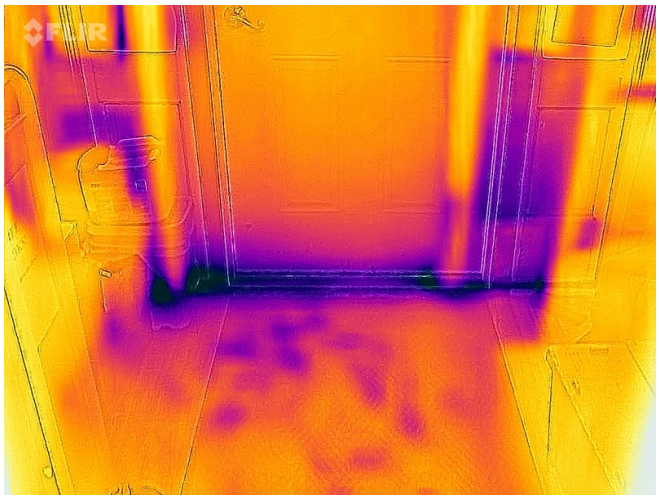
Attic has R-19 Fiberglass Batts on the Ceiling

Basement Window

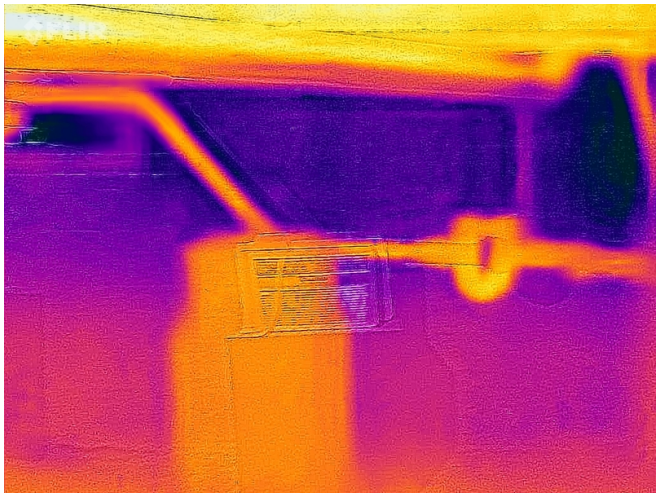


Final Result Blower Door Test = 1,480 CFM at -50.0 PA

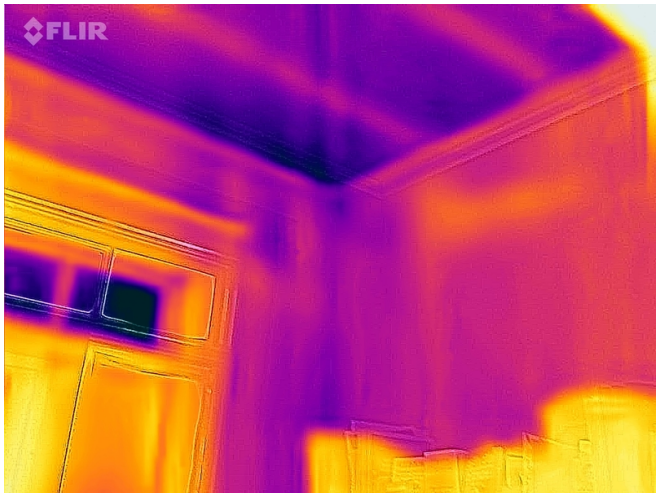
Blower Door Setup



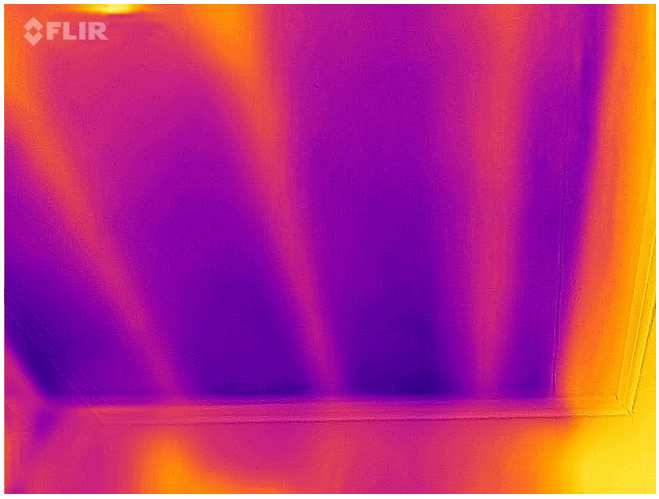
IR South Wall Front Door



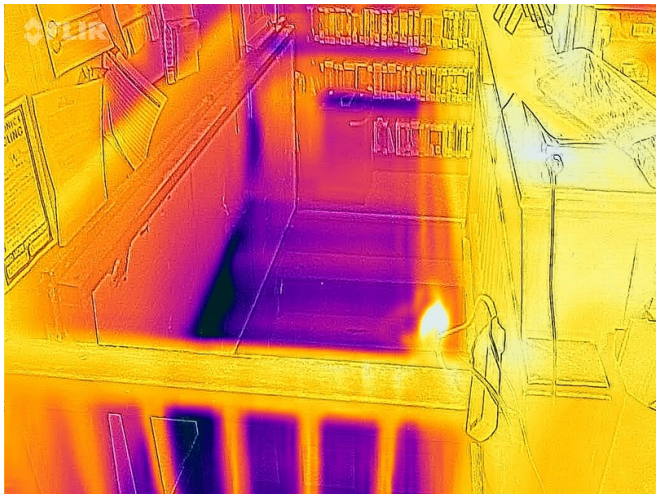
IR Basement



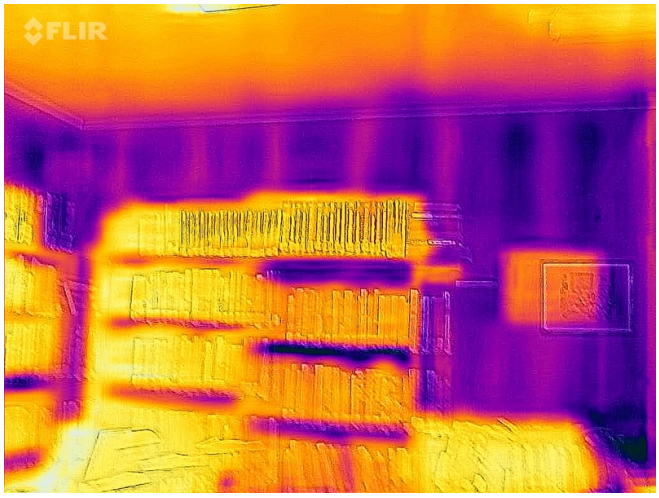
IR South Foyer, West Wall and Ceiling



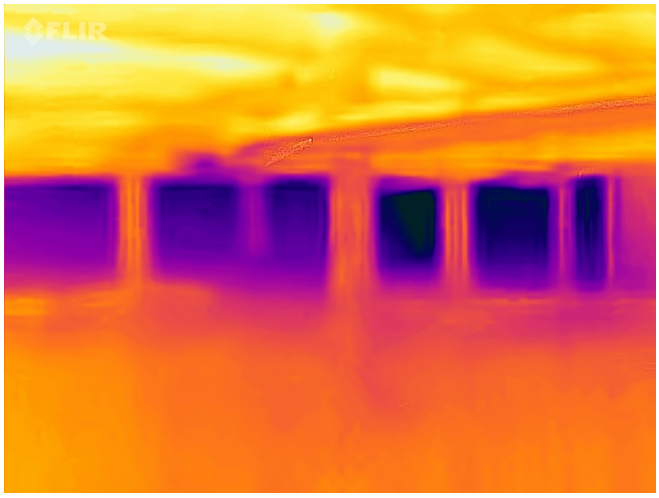
IR South Foyer Ceiling has No Insulation



IR Stairs to the Basement

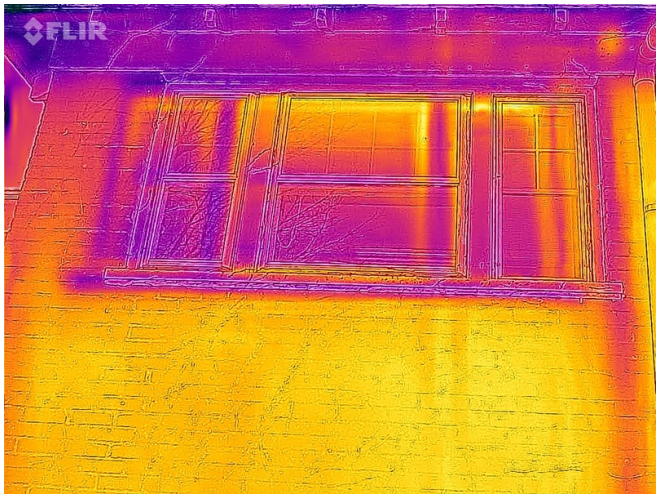


IR West Wall



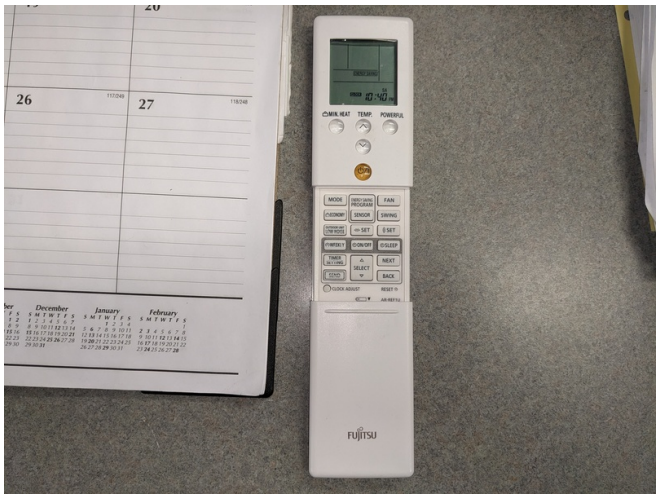
IR Basement

IR South Entry Door



IR East Wall Front Room Window

Fireplace and Chimney



Thermostat

Thermostat

Thermostat

Furnace by Olsen

Furnace by Olsen; Model: GTHC080-5; 80 kBTUh; 95% AFUE

ASHP Condenser by Fijitsu

ASHP Condenser by Fujitsu; Model AOU15RLS3H

ASHP Evaporator

ASHP Evaporator by Fujitsu; Model: ASU15RLS3

Window PTAC Stored in the Basement

Window PTAC by Frigidaire; Model: FRA064AT7; EER 10.7; Dated 11/10

Basement Exhaust Fan by Radon Away

Lighting in the Ceiling Mounted Exhaust Fan

Outside Light Over the Front Door Sign

Lighting in the South Front Entryway

Lighting in the Back Room

Lighting in the Basement

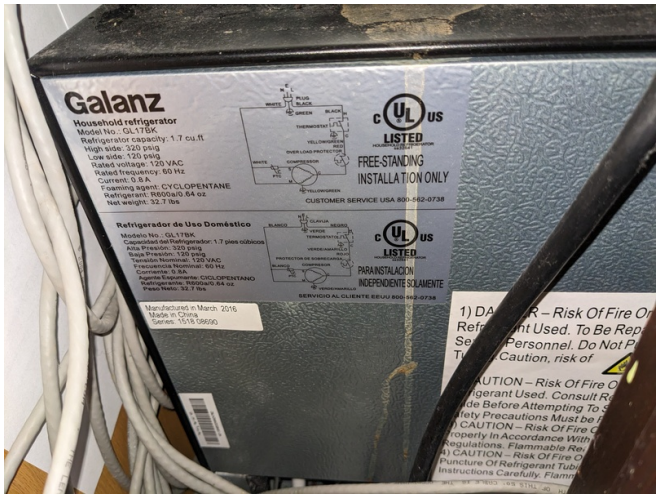
DHW Tank in the Basement

DHW by State Industries: Model: ES6-6-SOMS 200; 6 gal; 1650 W

1.6 GPF Toilet

2.2 GPM Rated Restroom Faucet

Refrigerator



Refrigerator by Galanz Nameplate

EXHIBIT B: SITE AND FLOOR PLANS

GRAND ISLE LIBRARY

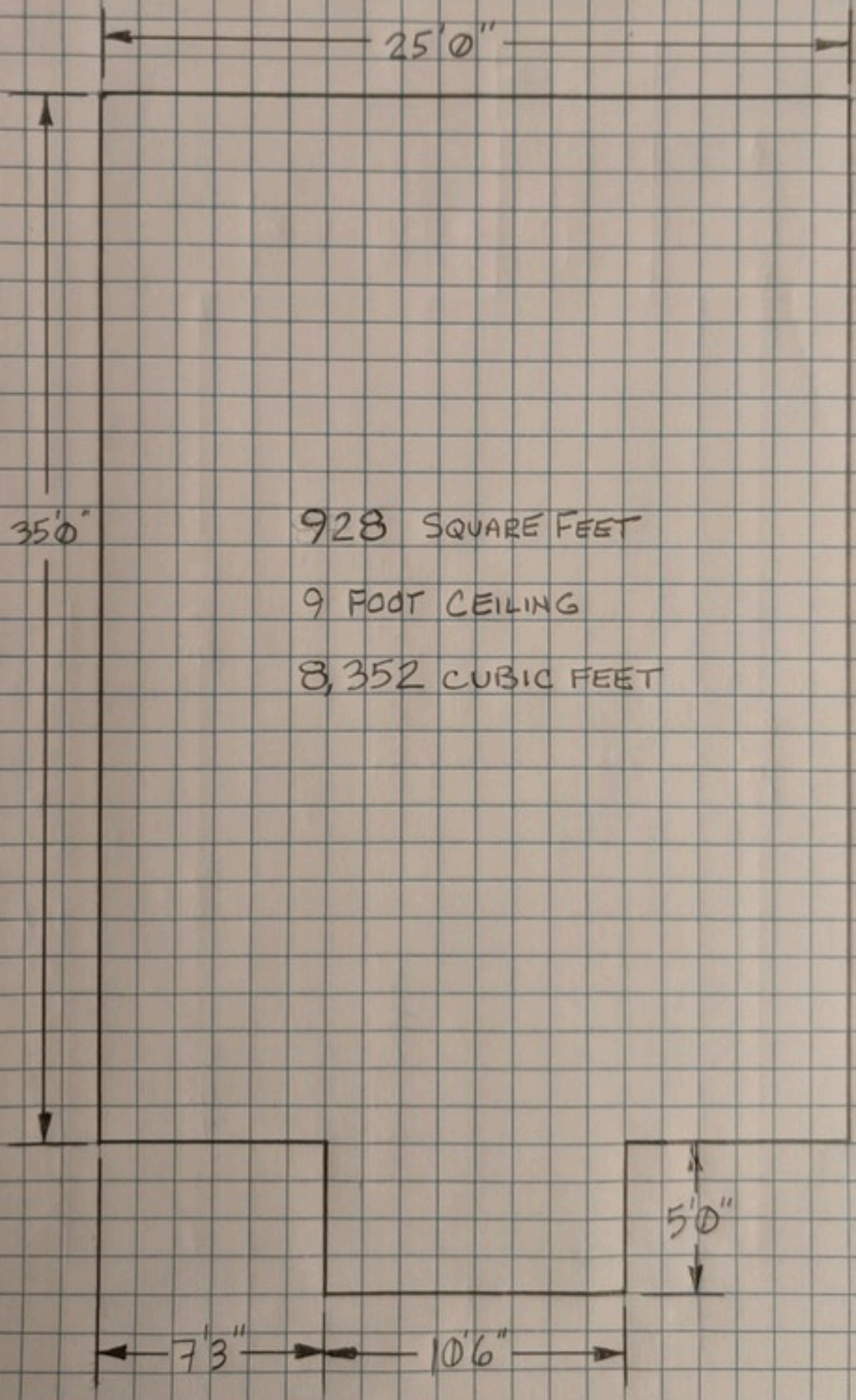


EXHIBIT C: MECHANICAL EQUIPMENT INVENTORY

HEATING EQUIPMENT													
Equip. Location	**Area Served**	**System Type**	**Make**	**Model #**	**Capacity**	**Cap. Units**	**Efficiency**	**Eff. Units**	**Year**	**Qty**	**Fuel**	**Dist.**	**RUL**
RECOMMENDED FOR REPLACEMENT													
Basement	Entire Building	Furnace	Olsen	GTHC 080-5	80	kBTUh	93%	AFUE	2006	One (1)	Propane	Ducted	Three (3) years
NOT RECOMMENDED FOR REPLACEMENT													
Outside	Entire Building	Condenser	Fujitsu	AOU15RLS3H	1.25	Ton	13.3	HSPF	2021	One (1)	Electric	Ductless Heat Pump	Nine (9) years

COOLING EQUIPMENT												
Equip. Location	**Area Served**	**System Type**	**Make**	**Model #**	**Capacity**	**Cap. Units**	**Efficiency**	**Eff. Units**	**Year**	**Qty**	**Dist.**	**RUL**
RECOMMENDED FOR REPLACEMENT												
None												
NOT RECOMMENDED FOR REPLACEMENT												
Inside	Entire Building	Evaperator	Fujitsu	ASU15RL33	1.25	Ton	25.3	SEER	2018	One (1)	Ductless Heat Pump	Nine (9) years
Outside	Entire Building	Condenser	Fujitsu	AOU15RLS3H	1.25	Ton	25.3	SEER	2021	One (1)	Ductless Heat Pump	Nine (9) years

DHW EQUIPMENT												
Equip. Location	**Area Served**	**Make**	**Model #**	**Capacity (BTU or kWh)**	**Efficiency**	**Direct or Indirect**	**Tank Size**	**Recirc. Pump HP**	**Year**	**Qty**	**Fuel**	**RUL**
RECOMMENDED FOR REPLACEMENT												
Basement	Entire Building	State	ES6-6-S OMS 200	1,650W	0.92 EF	Direct	Six (6) gallons	No	2017	One (1)	Electric	Three (3) years
NOT RECOMMENDED FOR REPLACEMENT												
None												

INTERIOR SITE LIGHTING									
Fixture Location	**Fixture Type**	**Lamp Type**	**Fixture Count**	**Lamp Count Per Fixture**	**Existing Lamp Wattage**	**Proposed Lamp Wattage**	**Control Type**	**Daily Run Hours**	**Type of Upgrade**
RECOMMENDED FOR REPLACEMENT									
Front Room	Linear Fluorescent	T8	Six (6)	Two (2)	32	Eleven (11)	On/Off	Six (6)	Fixture
Back Room	Linear Fluorescent	T8	Six (6)	Two (2)	32	Eleven (11)	On/Off	Six (6)	Fixture
Basement	Edison Socket	CFL	One (1)	One (1)	13	Nine (9)	On/Off	One (1)	Lamp

INTERIOR SITE LIGHTING									
Fixture Location	**Fixture Type**	**Lamp Type**	**Fixture Count**	**Lamp Count Per Fixture**	**Existing Lamp Wattage**	**Proposed Lamp Wattage**	**Control Type**	**Daily Run Hours**	**Type of Upgrade**
NOT RECOMMENDED FOR REPLACEMENT									
Entry	Edison Socket	LED	One (1)	One (1)	Nine (9)	None	On/Off	Six (6)	None
Restroom	Edison Socket	LED	One (1)	One (1)	Nine (9)	None	On/Off	Six (6)	None

EXTERIOR SITE LIGHTING									
Fixture Location	**Fixture Type**	**Lamp Type**	**Fixture Count**	**Lamp Count Per Fixture**	**Existing Lamp Wattage**	**Proposed Lamp Wattage**	**Control Type**	**Daily Run Hours**	**Type of Upgrade**
RECOMMENDED FOR REPLACEMENT									
None									
NOT RECOMMENDED FOR REPLACEMENT									
Front Door	Edison Socket	LED	One (1)	Two (2)	Sixteen (16)	None	On/Off	Three (3)	None
Left Side of Building	Edison Socket	LED	One(1)	Two (2)	Sixteen (16)	None	MS	Three (3)	None

REFRIGERATORS							
Location	**Make**	**Model #**	**Year**	**kWh/Year**	**Size (ft3)**	**Qty**	**RUL**
RECOMMENDED FOR REPLACEMENT							
None							
NOT RECOMMENDED FOR REPLACEMENT							
Front Room	Galanz	GL17BK	2016	208	1.7	One (1)	Two (2) years

FLOW RATE SUMMARY - SAMPLE			
Location	**Fixture Type**	**Qty**	**Flow (GPM or GPF)**
RECOMMENDED FOR REPLACEMENT			
Restroom	Faucet	One (1)	2.2 GPM
NOT RECOMENDED FOR REPLACEMENT			
Restroom	Toilet	One (1)	1.6 GPF

EXHIBIT D: SOLAR PROPOSAL

Nova Group, GBC

Proposal for Customer

Prepared by: jay@lifecyclebc.com
1404790405
morgan.carson@novagroupgbc.com

For:
10 Hyde Rd, Grand Isle

Quote #: 5305791
Valid until: Oct 16 2024

Solar Energy System Proposal

Dear ,

Thank you for the opportunity to present your Solar Energy System Proposal.

Best Regards,
jay@lifecyclebc.com
Nova Group, GBC

Nova Group, GBC

Proposal for Customer

Recommended System Option

99 %	$32,090	$32,025	$65
Consumption Offset	Lifetime Electricity Bill Savings	Net Cost of this solar system	Estimated net savings over system lifetime

Your Solution

Solaria PowerXT-370R-PD Series

17 Solaria PowerXT-370R-PD
370 Watt panels
with 25 Year Performance Warranty
Up to **20.5%** Module efficiency
6,752 kWh per year

SOLARIA

Battery

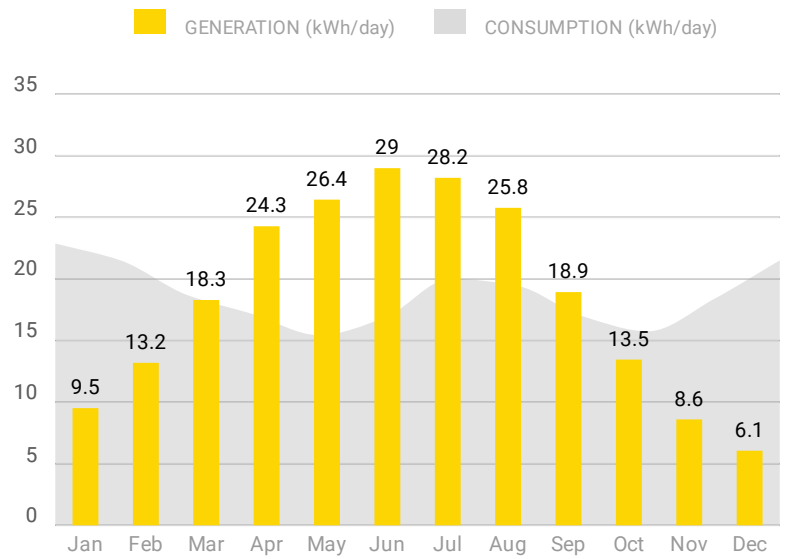
Beijing XD Battery Technology CO., Ltd.
38.4 kWh Total Battery Storage
1 x Beijing XD Battery 384V 100Ah

Warranties: 25 Year Panel Product Warranty, 25 Year Panel Performance Warranty

System Performance

99%

Energy From Solar



System Performance Assumptions: System Total losses: 14.7%, Inverter losses: 2.5%, Optimizer losses: 0%, Shading losses: 0%, Performance Adjustment: 0%, Output Calculator: System Advisor Model 2020.02.29.r2. Panel Orientations: 9 panels with Azimuth 260 and Slope 20, 8 panels with Azimuth 258 and Slope 20.

The solar system(s) quoted in this proposal are not intended to be portable.

Environmental Benefits

Solar has no emissions. It just silently generates pure, clean energy.

Each Year

99%

Of CO_2, SO_x & NO_x

185 kg

Avoided CO_2 per year

Over System Lifetime

3,394

Car miles avoided

35

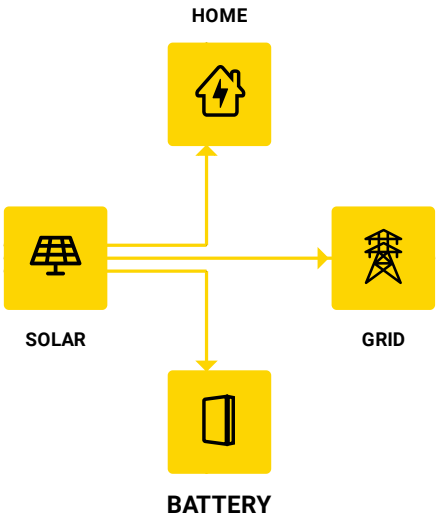
Trees planted

4

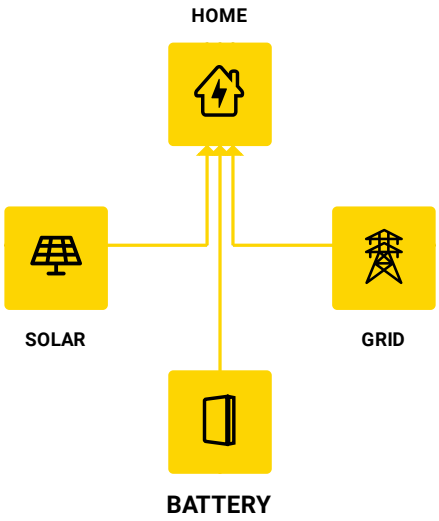
Long haul flights avoided

How your system works

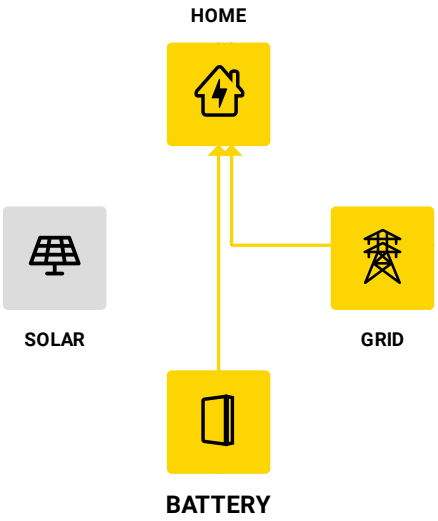
Generating Excess Solar



Partially Offset Usage

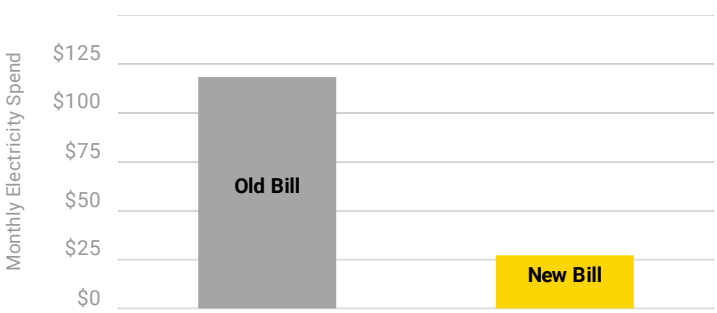


Night

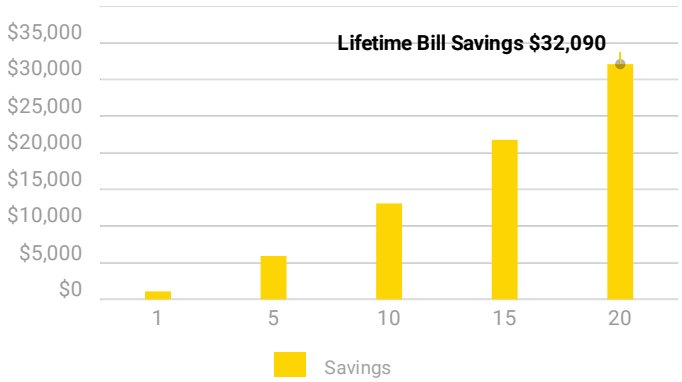


Electricity Bill Savings

First Year Monthly Bill Savings



Cumulative Bill Savings



Month	Solar Generation (kWh)	Electricity Consumption before solar (kWh)	Electricity Consumption after solar (kWh)	Utility Bill before solar ($)	Utility Bill after solar ($)	Cumulative Energy Credit ($)	Estimated Savings ($)
Jan	295	709	425	144	92	0	51
Feb	369	602	258	124	62	0	62
Mar	567	580	62	120	27	0	93
Apr	728	514	(182)	109	16	33	93
May	820	479	(314)	102	16	89	86
Jun	870	505	(339)	107	16	150	91
Jul	874	620	(221)	128	16	190	112
Aug	799	603	(162)	125	16	219	109
Sep	568	509	(41)	108	16	226	92
Oct	417	488	89	104	16	210	88
Nov	258	551	299	115	16	157	99
Dec	188	667	485	136	16	0	120

Rate not specified specified, using Residential Service based on location.

Your projected energy cost is calculated by considering a 4.0% increase in energy cost each year, due to trends in the raising cost of energy. This estimate is based on your selected preferences, current energy costs and the position and orientation of your roof to calculate the efficiency of the system. Projections are based on estimated usage of 6828 kWh per year, assuming Residential Service Electricity Tariff.

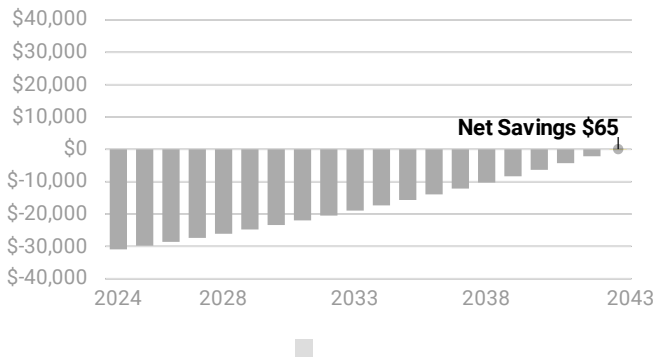
Your electricity tariff rates may change as a result of installing the system. You should contact your electricity retailer for further information.

Proposed Tariff Details - Green Mountain Power Rate 1	
Energy Charges	
Usage Charge *All Day*	$0.18 / kWh
Fixed Charges	
Fixed Charge	$16.00 / month

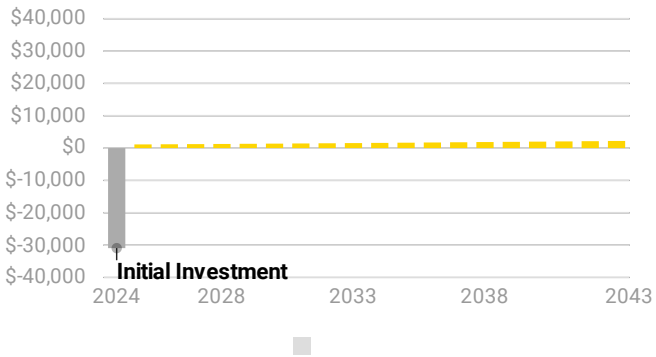
Net Financial Impact Cash

$32,090	-	$32,025	=	$65
Utility Bill Savings		Net System Cost		Estimated Net Savings

Cumulative Savings From Going Solar



Annual Savings From Going Solar



Estimates do not include replacement costs of equipment not covered by a warranty. Components may need replacement after their warranty period. Financial discount rate assumed: 6.75%

Quotation

Payment Option: Cash

17 x Solaria Corporation 370 Watt Panels (Solaria PowerXT-370R-PD) 1 x Beijing XD Battery 384V 100Ah (Beijing XD Battery Technology CO., Ltd.)	
Total System Price	$45,750.00
Purchase Price	**$45,750.00**

Additional Incentives

Federal Investment Tax Credit (ITC) The Federal Solar Tax Credit or The Federal Investment Tax Credit (ITC) for constructions starting in 2023.	$13,725.00
Net System Cost	**$32,025.00**

Price excludes Retailer Smart Meter should you want us to install your Smart Meter it will be an additional cost.
This proposal is valid until Oct 16 2024.

Quote Acceptance

I have read & accept the terms and conditions.

Signature _____

Name _____ Date _____

SOLARIA®

Solaria PowerXT® | DC Panel

Solaria PowerXT®-370R-PD

Achieving 20.5% efficiency, Solaria PowerXT solar panels are one of the highest power panels in the residential and commercial solar market. Compared to conventional panels, Solaria PowerXT panels have fewer gaps between the solar cells; this leads to higher power and superior aesthetics. Solaria PowerXT Pure Black™ panels are manufactured with black backsheet and frames, enhancing a home or building's architectural beauty.

Developed in California, Solaria's patented cell cutting and panel assembly takes processed solar wafers and turns them into PowerXT solar panels. The process starts by creating a highly reliable PowerXT cell where busbars and ribbon interconnections are eliminated. Solaria then packages the cells into the PowerXT solar panel, reducing inactive space between the cells. This process leads to an exceptionally cost effective and efficient solar panel.

Higher Efficiency, Higher Power

Solaria PowerXT panels achieve up to 20.5% efficiency; conventional panels achieve 15% – 17% efficiency. Solaria PowerXT panels are one of the highest power panels available.

Lower System Costs

Solaria PowerXT panels produce more power per square meter area. This reduces installation costs due to fewer balance of system components.

Improved Shading Tolerance

Sub-strings are interconnected in parallel, within each of the four panel quadrants, which dramatically lowers the shading losses and boosts energy yield.

Improved Aesthetics

Compared to conventional panels, Solaria PowerXT panels have a more uniform appearance and superior aesthetics.

Durability and Reliability

Solder-less cell interconnections are highly reliable and designed to far exceed the industry leading 25 year warranty.

About Solaria

Established in 2000, The Solaria Corporation has created one of the industry's most respected IP portfolios, with over 350 issued and pending patents in PV solar cell and module technology. Headquartered in Oakland, California, Solaria has developed a technology platform that unlocks the potential of solar energy.

TOP PERFORMER 2018 DNV·GL PV MODULE RELIABILITY SCORECARD

TÜVRheinland® Precisely Right.

The Solaria Corporation 1700 Broadway, Oakland, CA 94612 P: (510) 270-2500 www.solaria.com

Rev 3D 12-2019

SOLARIA®

Solaria PowerXT®-370R-PD

Performance at STC (1000W/m², 25° C, AM 1.5)

Solaria PowerXT-		365R-PD	370R-PD
Max Power (P_{max})	[W]	365	370
Efficiency	[%]	20.2	20.5
Open Circuit Voltage (V_{oc})	[V]	48.0	48.3
Short Circuit Current (I_{sc})	[A]	9.58	9.60
Max Power Voltage (V_{mp})	[V]	39.9	40.2
Max Power Current (I_{mp})	[A]	9.16	9.20
Power Tolerance	[%]	-0/+3	-0/+3

Performance at NOCT (800W/m², 20°C Amb, Wind 1 m/s, AM 1.5)

Max Power (Pmax)	[W]	269	272
Open Circuit Voltage (V_{oc})	[V]	45.1	45.4
Short Circuit Current (I_{sc})	[A]	7.73	7.74
Max Power Voltage (V_{mp})	[V]	36.7	37.0
Max Power Current (I_{mp})	[A]	7.32	7.35

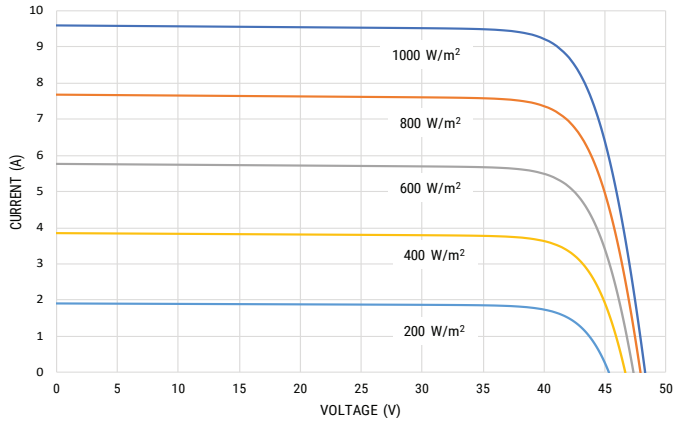
Temperature Characteristics

NOCT	[°C]	45 +/-2
Temp. Coeff. of P_{max}	[% / °C]	-0.39
Temp. Coeff. of V_{oc}	[% / °C]	-0.29
Temp. Coeff. of Isc	[% / °C]	0.04

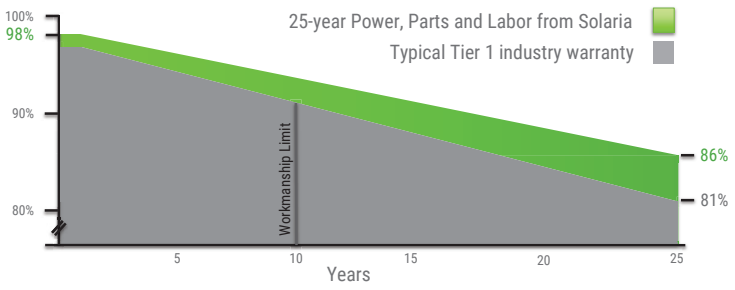
Design Parameters

Operating temperature	[°C]	-40 to +85
Max System Voltage	[V]	1000
Max Fuse Rating	[A]	15
Bypass Diodes	[#]	4

IV Curves vs. Irradiance (370W Panel)



Comprehensive 25-Year Warranty



Mechanical Characteristics

Cell Type	Monocrystalline Silicon
Dimensions (L x W x H)	63.8" x 43.9" x 1.57" 1621mm x 1116mm x 40mm
Weight	21 kg / 46 lbs
Glass Type / Thickness	AR Coated, Tempered / 3.2mm
Frame Type	Black Anodized Aluminum
Cable Type / Length	12 AWG PV Wire (UL) / 1000mm
Connector Type	MC4
Junction Box	IP67 / 4 diodes
Front Load	5400 Pa / 113 psf*
Rear Load	3600 Pa / 75 psf*

* Refer to Solaria Installation Manual for details

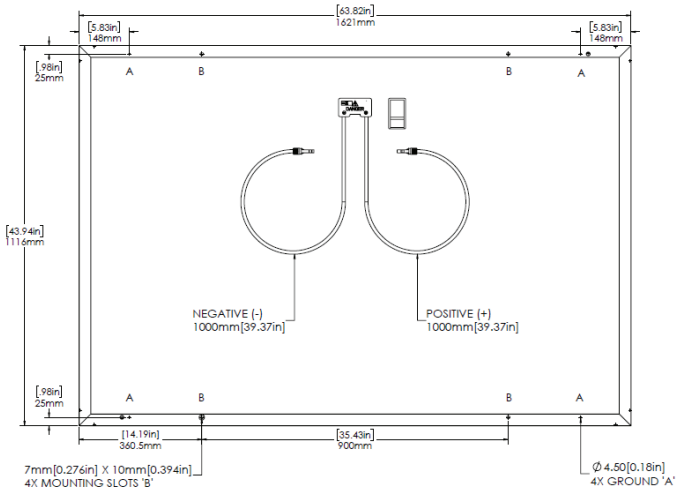
Certifications / Warranty

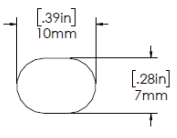
Certifications	UL 1703/IEC 61215/IEC 61730/CEC CAN/CSA-C22.2
Fire Type (UL 1703)	1
Warranty	25 years*

* Warranty details at www.solaria.com

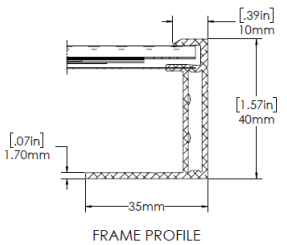
Packaging

Stacking Method	Horizontal / Palletized
Panels/ Pallet	25
Pallet Dims (L x W x H)	65.7" x 45.3" x 48.4" 1668mm x 1150mm x 1230 mm
Pallet Weight	590 kg / 1300 lbs
Pallets / 40-ft Container	28
Panels / 40-ft Container	700





MOUNTING SLOT 'B'



FRAME PROFILE

Nova Group

RESUMES OF PROJECT TEAM

EMPLOYEE RESUME

USING BUSINESS AS A FORCE FOR GOOD

KEELY FELTON, CEA
CHIEF SUSTAINABILITY OFFICER

PROFESSIONAL EDUCATION
Bachelor of Arts, Animal Behavior, Haverford College, Haverford, Pennsylvania, 2001

CERTIFICATIONS/QUALIFICATIONS
- Association of Energy Engineers (AEE) Certified Energy Auditor (CEA)
- AEE Certified Measurement and Verification Professional (CMVP), expired 2019
- Multifamily Building Analyst Training (to BPI-MFBA standard) – 36 hours
- TRUE Advisor Training Program
- Certified Water Efficiency Professional Training Program
- Certificate of Proficiency in Building Benchmarking, Consortium for Building Energy Innovation and the Department of Energy
- Certified Green Globes Professional
- Green Globes Fellow
- Certified GreenPoint Rater, Existing Home Multifamily
- Certified GreenPoint Rated, New Home
- BREEAM USA In-Use Assessor
- ASTM E1527 Environmental Site Assessment (ESA) for Commercial Real Estate Certificate
- HAZWOPER 8-hour Refresher (OSHA 29 CFR, Part 1910.120)

SELECTED EXPERIENCE
Ms. Felton oversees Nova Energy Group, a division within Nova Group, GBC. The group delivers, on average, 30 energy and water audits in addition to other green deliverables per month. In this capacity, she issues and reviews reports for the agency green lending programs (Fannie Mae Green Rewards, Freddie Mac Green Up, and HUD) while working closely with Nova's debt clients to make sure that all pertinent information is communicated throughout the due diligence process.

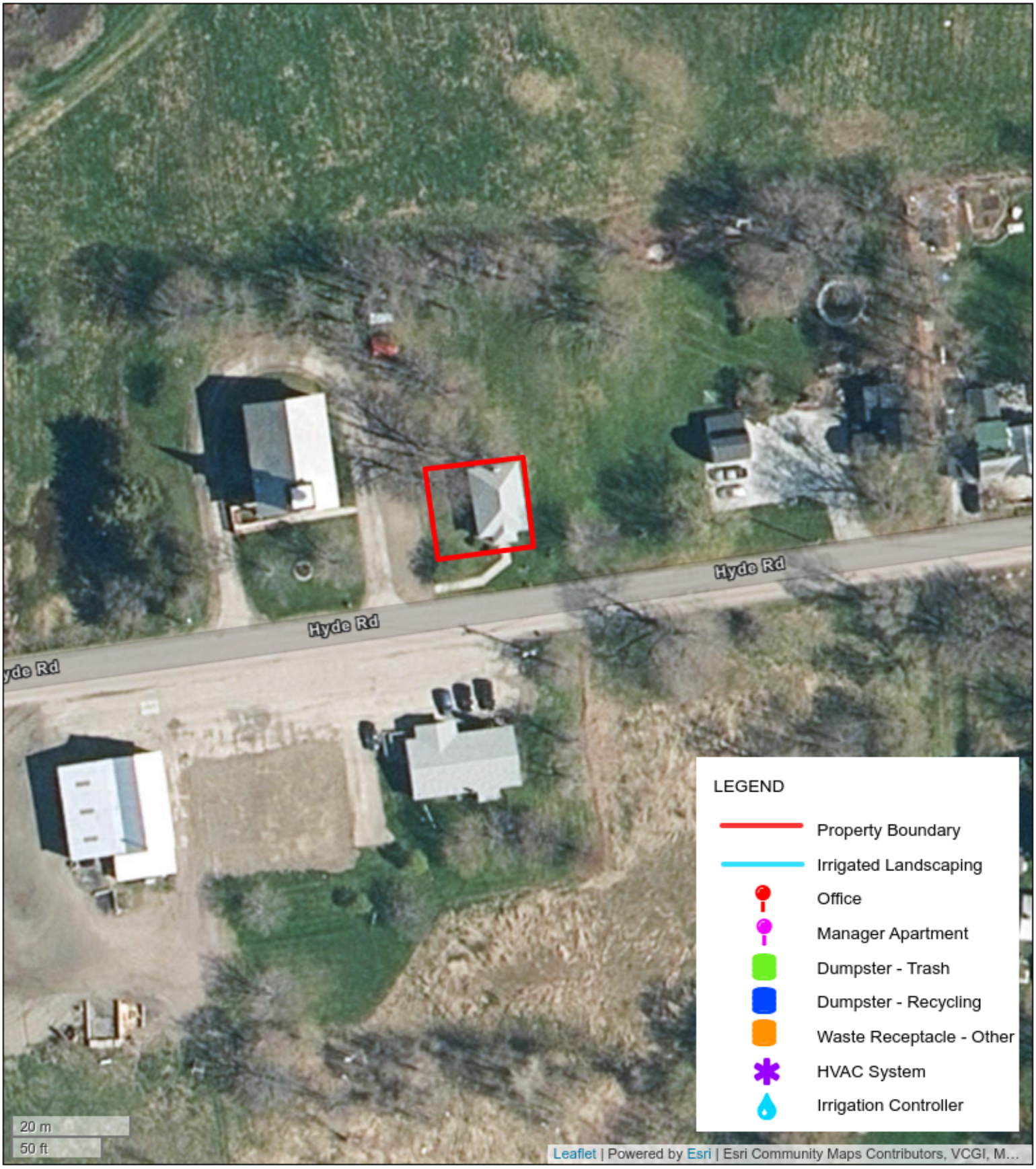
Additionally, Ms. Felton enjoys long-term relationships with property owners meeting more targeted energy and water goals with the group's equity energy work. These services include energy benchmarking and ongoing monitoring of utility consumption, energy modeling, strategic energy planning, project management, measurement and verification of energy savings, and ESG services.

Ms. Felton obtained her Certified Energy Auditor and Certified Measurement and Verification Professional certifications from the Association of Energy Engineers. She is highly experienced with utility data analysis for a broad spectrum of multifamily properties. Additionally, she is proficient in the use of ENERGY STAR's Portfolio Manager for obtaining benchmark scores and certification. Ms. Felton is certified as a Green Globes Professional, GreenPoint Rater, and BREEAM USE In-Use Assessor.

PROFESSIONAL ORGANIZATIONS
- Association of Energy Engineers (AEE)
- Urban Land Institute (ULI)
- Build it Green
- Green Building Initiative (GBI), Board of Directors

Nova Group

PARCEL MAP



Property Details Map

Grand Isle - Free Library
10 Hyde Rd
Grand Isle, VT
Project Number: SE24-2607


Nova
Group
Carbon
Neutral
Report
novagroupgbc.com/carbonneutral