Summer 2023

Portsmouth Housing Authority Sustainability Plan

PORTSMOUTH HOUSING

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& PHA HOUSING DEVELOPMENT LTD.
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Summary

Anthropogenic climate change has emerged as not only the most significant threat to the health of our environment, but it is also one of the largest threats to achieving a more equitable distribution of resources and the quality of life those resources represent.

The motivation for creating sustainability plan stems from the fact that, despite low-income populations around the world consuming fewer goods, natural resources, and energy, than high-income populations, the catastrophic impact of climate change disproportionately affects these low-income groups. We expect to see droughts, sea level rise, floods, extreme weather events and resource scarcity continue. Low-income people often do not have the resources to recover from these events. Portsmouth Housing Authority's mission is motivated by our core belief in the importance of equity. For this reason, becoming more sustainable is a priority for us.

Systematically adopting sustainable practices is our best bet to mitigate climate change. Creating a sustainability action plan is the first step. This plan will outline what aspects of sustainability PHA plans to address in the coming years and our methodology for doing so.

The methodology used to create this plan included data collection, literature review, interviews, and started with an energy benchmarking effort in the summer of 2023. The goal of the benchmarking was tracking the electricity, natural gas, water usage, and solid waste generated in PHA's properties for a baseline year (May 2022 – June 2023) and going forward. Benchmarking will allow us to evaluate the effectiveness of our sustainability efforts going forward, with this there is no better time to create a formal sustainability plan.

Matt Osgood
Sustainability Coordinator

Craig W. Welch
Executive Director

Part 1: Sustainability Values

The PHA's values are consistent with all 17 of the United Nations Sustainable Development goals, with most emphasis towards:

Good Health and Well-Being

Our work as a housing authority is built on the idea that everyone should have a safe, decent, affordable place to live. This value is an extension of that idea, our mission needs to go farther than just providing affordable housing, it needs to invest in policies and technology that attempt to improve living conditions that support good health.

Affordable and Clean Energy

Renewable technology and clean energy in its current form is expensive. This excludes members of our community from participating in sustainability. We believe that sustainability should be accessible by all. This is why making clean energy available and affordable is a priority.

Responsible Consumption

We recognize the limited nature of our planet's resources. We know that the scarcity of resources leads to restricted access for disadvantaged communities. This is why we are committed to reducing our consumption.

Climate Action

Increasing natural disasters and extreme climate events around the world have made it clear that aggressive climate action is overdue. We wish to be part of the solution and actively participate in fighting climate change.

Long-Term Solutions

To achieve true sustainability our organization must be ready for the challenges of climate change. We are committed to improving the resilience of our buildings as well as adopting new technologies that will ensure our ability to provide our service to the community indefinitely.

Part 2: Key Stakeholders

PHA interacts with multiple different groups. It is important to outline how this plan has the capacity to affect these groups. As well as how it might involve them.

Implementing a sustainability plan has the capacity to affect groups involved with PHA. We feel it is important to consult those groups in the ongoing process of the sustainability plan. Having clear and timely communication with these stakeholders is a priority. These stakeholders include residents, staff, leadership, elected leaders, utilities, advocates, the community, contractors, and vendors.

Residents

Resident engagement is an integral part of our plan. The sustainability efforts that we put forth are first for our residents and secondly for the greater community. The residents themselves are the best equipped to identify what needs to be done. We wish to align our priorities with those of the residents. It is for this reason that as part of our plan we will ensure a dialogue around sustainability be maintained between PHA and residents. This will include PHA communicating its intentions clearly and directly with residents and giving them an opportunity to give their input.

Part of this communication will involve sharing the results of any research we do. This includes any audits we conduct or benchmarking results. An explanation should be provided as well. This should provide our reasons for conducting the research as well as what problems we found and what can be done to fix them going forward.

Staff

Staff engagement is likewise integral to the success of our plan. Staff will be involved in identifying, decision-making and implementation of any projects. Buy-in from staff will ensure the quality and longevity of our sustainability efforts.

Leadership

The leadership of the PHA, including members of our Boards, the Executive Director and Senior Management will ensure continued investment and the success of this Plan.

Utilities

Utilities have the capacity to affect the structure of this plan as they control and fund a variety of sustainability initiatives.

Advocacy groups

Advocacy groups play a large role in the community's sustainability progress. It is our intention to get involved with advocacy groups whenever the opportunity presents itself.

PHA contractors and vendors

We acknowledge that the actions of PHA contractors and vendors on behalf of PHA is part of our impact. We will educate, encourage, and include sustainability measures in bidding and contracts to enlist contractors and vendors to participate in this plan.

Community

When taking on any issue, a community working together is more effective than its parts. For an issue as great as climate change this is especially true. For this reason, we will look to the city, state, and federal, civic groups, and associations for guidance.

Part 3: Sustainability Team

To support our values, make best use of our benchmarking data, identify opportunities and steer the implementation we will form a Sustainability Team. This team will be comprised of internal and external stakeholders and may include, along with PHA staff, a PHA resident, local advocate, building science professional, or others that will contribute positively to this effort. Regular team meetings will be held and the team will be charged with publishing an Annual Report consisting of benchmarks to be updated annually. The meeting will review the energy data and assess our progress toward our sustainability goals.

The input of stakeholders is integral to developing and revising this plan. The meeting will also be a time to collect input from stakeholders. We hope to represent all stakeholder groups on the committee so that the input can be gathered and shared more effectively. We believe strongly that any individual affected by the plan should be able to give their input.

The responsibility of the committee will be to evaluate benchmarking data. This evaluation should focus on determining the prior year's efforts success. Prior to the meeting, a smaller team will organize the data into a report and present it during the meeting. Additionally, the data will support a discussion of the progress toward our goals. Metrics like EUI (Energy Use Intensity) and estimated GHG (greenhouse gas) emissions will give us insight into the standing of each property as it relates to our targets.

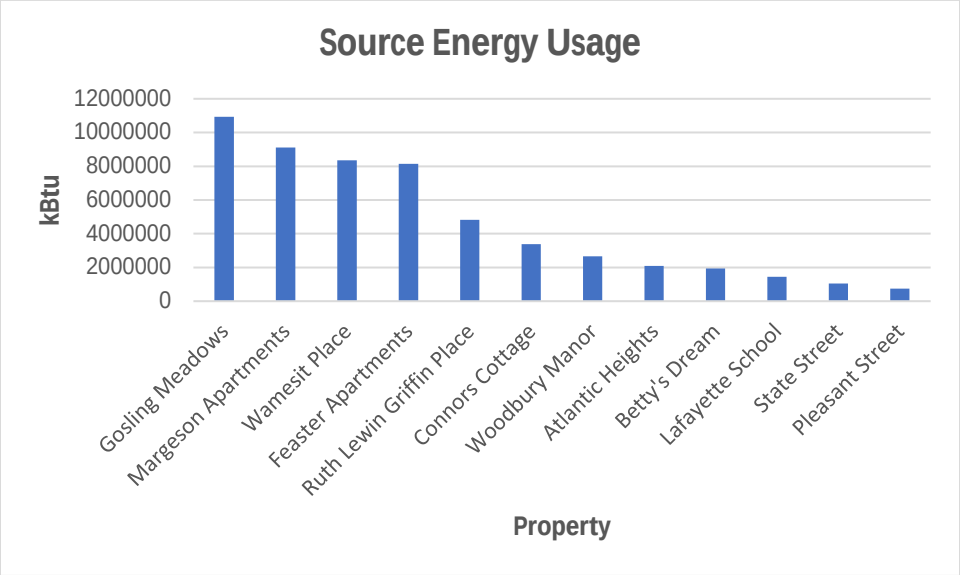
Further the committee will identify where we have fallen short of our plan and what needs to be done to get back on track. Finally, they will determine if any changes need to be made to our goals.

The data we collect should be made available to stakeholders. A special consideration should be made to the methods of publicizing the data. Multiple methods should be used to reach a wider range of people.

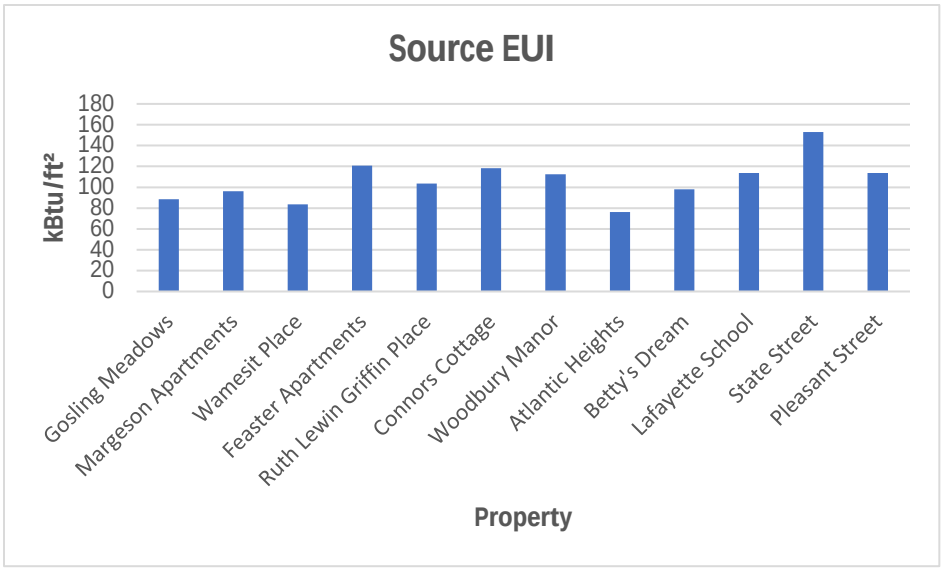
Part 4: Benchmarking, Measurement & Data Analysis

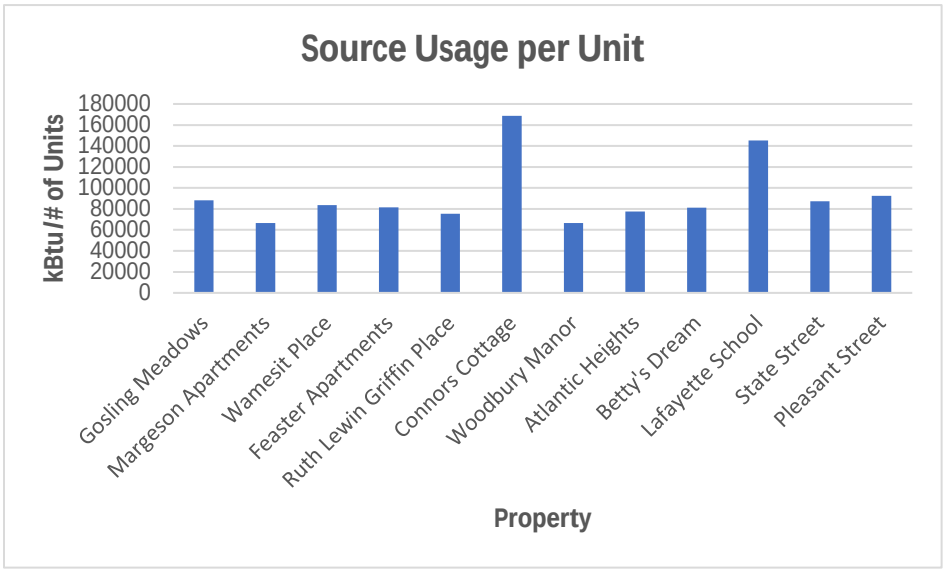
The first step to solving any problem is gathering information. This was the motivation behind benchmarking. It gave context to any future sustainability efforts and gave us an idea of where we stand today. To conduct this project, we used the program **Portfolio Manager**. The program logs past and current energy, water, and solid waste usage. The program also allows for advanced analysis of the data. A library of metrics can be calculated proving sufficient data. This will be used to compare different sized buildings. We intend to continue our benchmarking efforts indefinitely.

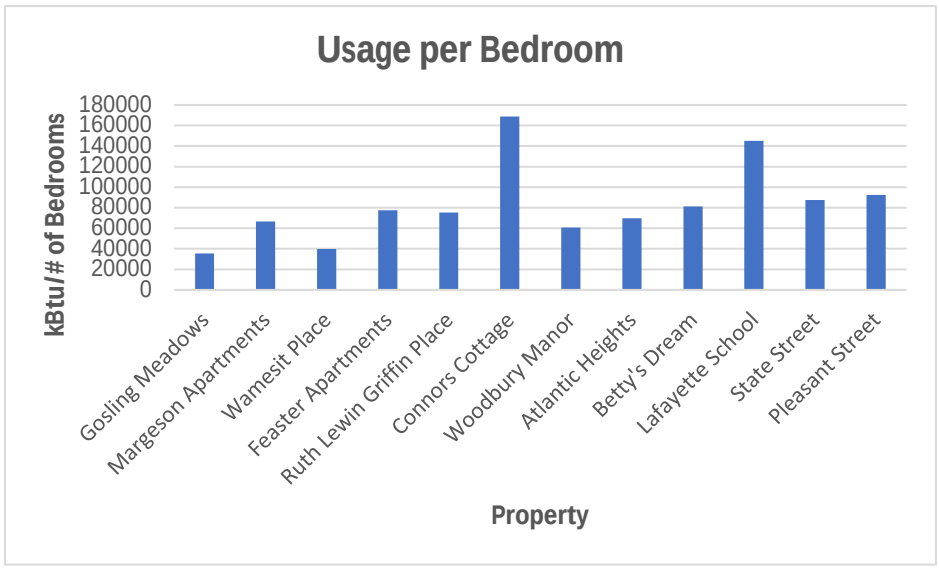
Our findings give us an idea of where sustainability projects are most needed in our portfolio, it will also allow us to track the impact of these projects after they have been completed. To give an idea of what the benchmarking has yielded some basic usage information is below.

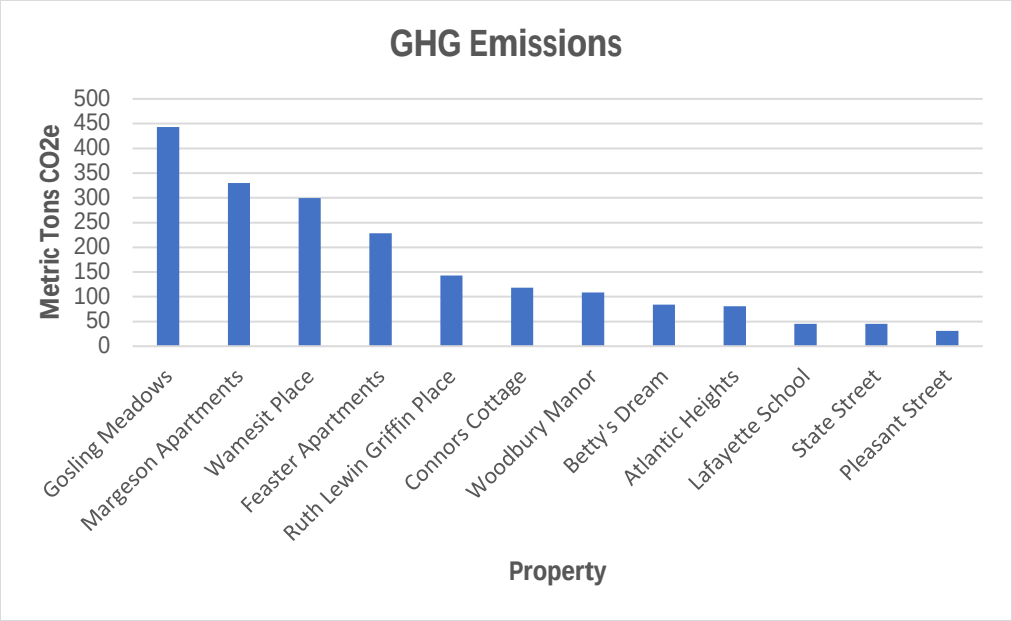


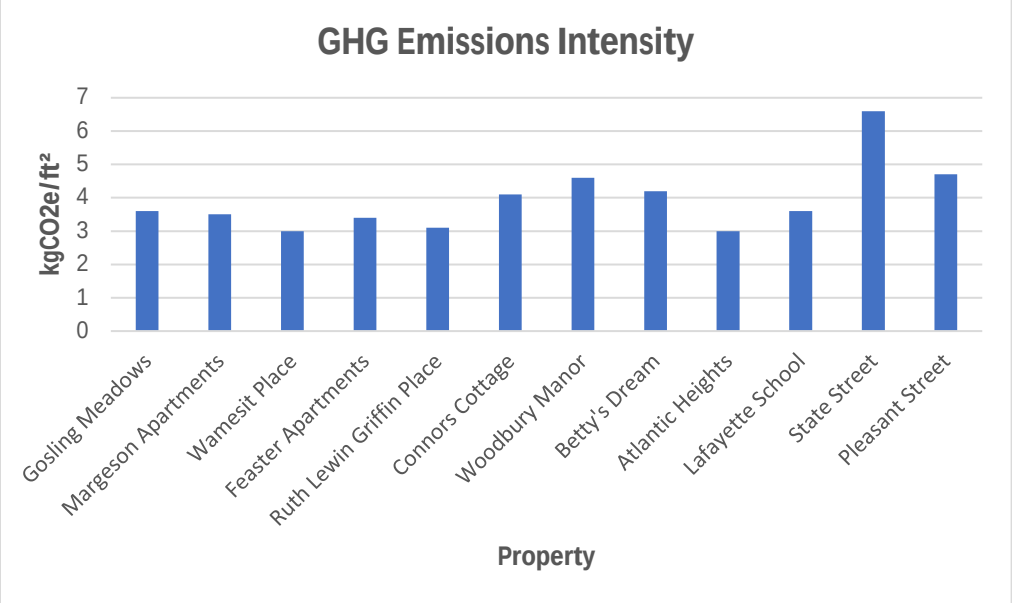
The graphs below use the terms EUI and source usage. EUI or energy use intensity refers to the amount of energy usage per square foot for a building. Its unit is kBtu/ft^2. Source Usage, as opposed to site usage, refers to the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses.


Source EUI
kBtu/ft²
180
160
140
120
100
80
60
40
20
0
Gosling Meadows
Margeson Apartments
Wamesit Place
Feaster Apartments
Ruth Lewin Griffin Place
Connors Cottage
Woodbury Manor
Atlantic Heights
Betty's Dream
Lafayette School
State Street
Pleasant Street
Property


Source Usage per Unit
kBtu/# of Units
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
Gosling Meadows
Margeson Apartments
Wamesit Place
Feaster Apartments
Ruth Lewin Griffin Place
Connors Cottage
Woodbury Manor
Atlantic Heights
Betty's Dream
Lafayette School
State Street
Pleasant Street
Property


Usage per Bedroom
kBtu/# of Bedrooms
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
Gosling Meadows
Margeson Apartments
Wamesit Place
Feaster Apartments
Ruth Lewin Griffin Place
Connors Cottage
Woodbury Manor
Atlantic Heights
Betty's Dream
Lafayette School
State Street
Pleasant Street
Property


GHG Emissions
Metric Tons CO2e
500
450
400
350
300
250
200
150
100
50
0
Gosling Meadows
Margeson Apartments
Wamesit Place
Feaster Apartments
Ruth Lewin Griffin Place
Connors Cottage
Woodbury Manor
Betty's Dream
Atlantic Heights
Lafayette School
State Street
Pleasant Street
Property


GHG Emissions Intensity
kgCO2e/ft²
7
6
5
4
3
2
1
0
Gosling Meadows
Margeson Apartments
Wamesit Place
Feaster Apartments
Ruth Lewin Griffin Place
Connors Cottage
Woodbury Manor
Betty's Dream
Atlantic Heights
Lafayette School
State Street
Pleasant Street
Property

Limitations of Data

In our benchmarking efforts we have found that collecting a full data set is a complicated process. Because some of our residents pay for their own utilities, we do not have direct access to that data. Instead, we must go through Eversource. To maintain resident privacy, the data must be aggregated per property. Eversource will also only send us data at most twice a year. In addition to this, in any given month the bill for electric water and gas comes in sporadically and the water bill lags a month. For our purposes it is better to evaluate the data yearly to mitigate the challenges that come with data entry.

To make data entry less time-consuming utilities sometimes offer a service that directly uploads usage data into **portfolio manager**. Eversource supports this feature but only for PHA's accounts. Some of our residents pay for their own electricity. Getting access to this data is a challenge. Eversource requires resident usage data to be aggregated across the whole building to ensure privacy. For this data they do not support direct upload. Instead, we must request the data in, at least 6-month intervals at this email Support@eversource.com. We can reevaluate our prosses when they do come out with aggregation support. At that time, we may want to try to get them to separate the miscellaneous into different accounts by building so we can get that directly uploaded as well.

Part 5: Funding

The PHA and PHA Housing Development Ltd. will allocate operating and capital funds for the development of this plan, while the Sustainability Team and PHA Executive staff pursue Federal, State and Local financing opportunities. In many cases, funding will be more easily awarded to consortia and the PHA will maintain relationships with private or public organizations who would be likely partners. The PHA may also choose to procure grant writers or other professionals who can increase our likelihood of getting funding awards.

At the time of this writing, there are billions in public dollars being provided to help organizations like the PHA to invest in sustainability measures, most prominently in energy efficiency and renewable energy.

The PHA will also seek out state funding from the NH State and US Department of Energy, the Environmental Protection Agency, HUD, DOT, City of Portsmouth Capital Funds and Community Development Block Grants, the New Hampshire Charitable Foundation, and others.

The PHA will also track and support State and Federal policy proposals such as Net Metering, and new requirements for Federal contractors like the PHA.

Part 6: Order of Operations

This order of operations is all about right-sizing the larger upgrades in the name of resource and financial efficiency. Doing that large upgrades first and reducing consumption later can lead to a system that is overkill for your building's needs. It is always best to reduce the needs of your building as much as possible and then get the smallest system that will meet those needs.

This prioritization can be isolated for individual properties and buildings. In other words, not all our properties need to be running efficiently to consider a new heat pump system, only the building that we are considering the new system for.

Steps are not one and done. Each step should be evaluated regularly.

Step 1: Planning and Measurement

- Benchmark all energy, water, and waste usage.

Step 2: Create a Sustainability Team

- Represent important stakeholder groups on the committee.
- Establish date of first meeting and subsequent annual meetings.
- Determine the authority that the committee has.

Step 3: "Quick Hit Projects"

- Incentivize and prioritize easy to implement low-cost solutions at every opportunity.
- Do upfront work that will provide greater speed time between idea and implementation.
- Creates early opportunities to highlight and celebrate success.

Step 4: Review Routine Operations and Maintenance

- Assure all routine measures are completed efficiently and of high quality.
- Understand and abide by all specifications provided by engineers and product manufacturers such as replacing filters, maintaining, and improving water and stormwater infrastructure.
- Use materials and supplies absent of any synthetic toxic substances.
- Maintain a robust inspection schedule that includes observing tenant behavior that impedes sustainable practices.
- Replace all appliances with high efficiency models.

Step 5: Create and implement Resident Education and Behavioral Incentives

- Educating residents to change behavior surrounding efficiency.
- Implementing sustainability minded policy such as ensuring lights are off in common areas when not in use.

Step 6: Building Envelope Improvements

- This step includes projects that require more time and capital to complete than step 3 but do not alter the fundamental workings or structure of the building.
- Some examples are:
    - Replacing/upgrading insulation in walls/ceilings
    - Upgrading windows and doors to improve building envelope.

Step 7: Heating and Cooling

- These are the upgrades we are trying to right-size.
- Upgrading to a new heating system
    - Ex. Natural gas to heat pump.
- New HVAC system

Step 8: On-Site Generation and Storage / New Technology

- These upgrades are directly linked to the building's consumption.
- Renewable energy generation
- On-Site energy storage

Part 7: Outcomes & Timeframe

Outcome	Action	Target	Responsibility	Timeframe
Replace all fossil fuel consuming systems with renewable energy.	Draw down consumption. Invest in renewables. Improve building envelope. Commit to O&M improvements.	100% renewable energy by 2040. Reduce consumption by 25% by 2033. All existing properties below median **source EUI (118.1).** All new buildings net zero.	Sustainability Team	100% by 2040 50% by 2033
Protect and maintain the health of our residents.	Driven by resident input. Improve air quality. Improve climate control.	Ensure HVAC systems are adequately filtering air. Prevent extreme temperatures in buildings. Improve comfort	Sustainability Team Resident Services	Establish prosses within the year. Ongoing
Resident motivation and education	Implement behavioral science framework. Honor and act on input from residents. Incentivize sustainable behavior. Clearly communicate sustainability to residents.	Develop Engagement metrics. Reduce costs to residents. Complete sustainability projects that residents want	Resident Services Property Managers Sustainability Team	Establish frameworks within the year. Ongoing
Staff and community engagement	Motivate, educate, and incentivize sustainable behavior. Add sustainability metrics to all current training. Join local, state, and national state associations.	Join the discourse surrounding the City of Portsmouth climate action plan	Sustainability Team	Ongoing

Terminology

Anthropogenic Climate Change – Human caused climate change.

Building Envelope – The barrier between the inside and outside air

EUI (Source and Site) – Measured in kBTU/Sqft, tracks the energy usage per square feet.

- **Site EUI:** Only energy used on the property included in kBTU.
- **Source EUI:** Energy used on site as well as that lost in transmission factored into kBTU.

O&M – Operations and Maintenance

Portfolio Manager – EPA's energy benchmarking program

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APPENDIX
Property Utilities

Development Name	Year Built	TOTAL UNITS	Resident Paid Utilities				
			AC	Cable	Heat	Hot Water	Electric
Atlantic Heights	1996	30	Monthly Fee	Monthly Fee	Included	Included	Included
Betty's Dream	1985	24	N/A (tenants pay electric)	Monthly Fee	Included	Included	Not Included
Connors Cottage	1895	20	N/A (tenants pay electric)	Monthly Fee	Included	Included	Not Included
Feaster Apartments	1970	100	N/A (tenants pay electric)	Monthly Fee	Not Included	Included	Not Included
Gosling Meadows	1958	124	N/A (tenants pay electric)	Not Included	Included	Included	Not Included
Lafayette School	2009	10	N/A (tenants pay electric)	Monthly Fee	Included	Included	Not Included
Margeson Apartments	1973	137	Monthly Fee	Monthly Fee	Included	Included	Included
Pleasant Street	1962	8	Monthly Fee	Monthly Fee	Included	Included	Included
Ruth Lewin Griffin Place	2021	64	N/A (tenants pay electric)	Not Included	Included	Included	Not Included
State Street	1962	12	Monthly Fee	Monthly Fee	Included	Included	Included
Wamesit Place	1973	100	Monthly Fee	Not Included	Included	Included	Included
Woodbury Manor	1962	40	Monthly Fee	Monthly Fee	Included	Included	Included