

# Zero Energy for the Ocean State: A Multi-Agency Investment in Zero Net Energy Affordable Homes

**Rhode Island Housing**

Rental Housing: Multifamily Management

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### **A Multi-Agency Investment in Zero Net Energy Affordable Homes**

Rhode Island, like so many states in the nation, has a critical shortage of affordable housing. Rhode Island residents also face high energy/utility costs in a coastal region struggling with the impact of climate change. RIHousing has always worked closely with our development partners to respond to the need for affordable housing while considering environmental impacts, utility costs for residents and operational benefits for property owners and managers. But in the last few years, we took that commitment one big step forward: with the launch of our Zero Energy for the Ocean State (ZEOS) program.

In 2019, after years of collaboration, research, listening and learning, RIHousing rolled out our new ZEOS program, an effort to respond to the need for affordable housing while also reducing energy consumption and costs. **We asked ourselves “What if we came up with funding to support a net zero effort in affordable housing developments that could be used as a cost-effective and replicable model for success?”**

Net zero is the balance between the power a home needs and the renewable energy you can generate to match the need. RIHousing’s ZEOS program provides innovative financing and collaboration with statewide partners to solve a wide range of challenges, including affordable housing, energy consumption, reduction of carbon footprint and housing and operational costs. Rather than treating these as separate challenges, the ZEOS program is based on a strategy to tackle them comprehensively.

Now in its second funding round, the program has provided \$1,365,000 (Round 1: \$625,000; Round 2: \$740,000), for 8 developments (138 units) and has leveraged \$39,972,618 while also creating replicable models for sustainability.

### **Program Need**

Household energy use accounts for about 20% of greenhouse gas emissions in the United States. At the same time, housing is in short supply. Fortunately, many government entities and industries are currently working to reduce energy waste, create cost savings and/or decrease our carbon footprint. From President Biden’s Executive Order to cut the nation’s overall emissions to net zero by 2050, to the AIA’s 2030 Commitment to create a climate strategy that provides a set of standards and goals for reaching net zero emissions in the built environment, the federal government and building and construction industries have been trying to develop creative and innovative solutions to tackle the problems.

Locally, National Grid and the Rhode Island Office of Energy Resources have been working to develop financial incentives to help property owners reduce their costs and make smart choices about energy efficiency and consumption. In fact, our state has committed to meet a net-zero emissions target by 2050. The ZEOS demonstration program builds upon the momentum of recent successes in growing our green energy economy, while expanding affordable housing options for Rhode Islanders and reducing utility and operating costs.

### **Social Equity, Sustainable Development and Net Zero Housing**

The net zero movement is often associated with luxury homes for populations with more disposable incomes. But it is low and fixed-income households who benefit the most from lower energy costs and energy efficient building design and construction. These populations often bear an undue energy burden, with electricity costs accounting for up to 20% of their incomes, which can perpetuate cycles

of poverty. These same populations are also more likely to experience negative health effects such as increased asthma and/or allergy symptoms as a result of poor indoor air quality. Addressing the need for healthy and affordable housing while reducing housing/utility costs supports social equity efforts, increases lower-income populations' access to high-quality, healthy housing, and results in a positive environmental impact.

### **Building Better**

Net zero housing efforts benefit from the utilization of smart and innovative construction techniques and materials that build in efficiencies at every step along the design, development, and construction process. Incorporating the most energy efficient materials into new construction and rehab projects supports the highest standards of efficiency to keep costs down. Improved heating, ventilation, and air-conditioning (HVAC) systems, updated appliances, building envelopes, and smart home energy management systems can all positively impact energy consumption and costs. Strategic selection of materials such as insulation and windows can increase efficiencies to reduce costs and regulate heat.

### **Impacts of Net Zero Housing**

*Net zero: a project that will generate the same amount of energy that it would use on an annual basis.*

Net-zero energy properties provide affordable and healthy housing solutions with high quality materials and construction techniques and lower utility costs for owners and tenants. Net zero housing efforts are not only suitable for single-family homes. In fact, studies show that multi-family housing now produces the majority of net zero units in the United States.

RIHousing is committed to developing housing that Rhode Islanders can afford and energy efficient features help reduce operating costs for property managers/owners and occupancy costs for residents, thereby increasing their disposable income to meet other needs in their lives.

### **Zero Energy for the Ocean State (ZEOS)**

Launched in 2019 with a second funding round in 2021, RIHousing's ZEOS program is our response to incentivizing affordable homes with innovative, replicable solutions to utilize cost saving, clean energy technologies. A public-sector partnership between RIHousing, the Rhode Island Office of Energy Resources (OER) and National Grid, we jointly launched the ZEOS program to help develop highly energy efficient housing for low- and moderate-income Rhode Islanders.

Established as a "demonstration" program, this **multi-agency investment aims to create replicable models for sustainable development while also helping to reduce the collective carbon footprint of the state, reducing energy costs for residents and creating operational benefits for property owners and managers.** The effort will help our state accelerate its investment in cost-effective, clean energy solutions that reduce energy consumption and costs, shrink our carbon footprint and grow good-paying jobs. The principles of this program – to create replicable designs incorporating strategies to reduce energy cost burdens, improve thermal comfort, and support the clean energy future – are critical to ensuring a reliable, equitable and scalable pathway to decarbonization for all Rhode Islanders.

To qualify for this program, developers must commit to designing and constructing affordable, Zero Energy Buildings (ZEBs). ZEBs are defined as any energy-efficient building with zero net energy consumption, meaning the total amount of energy used by a building on an annual basis is roughly equal to the amount of renewable energy created on the site.



In addition to meeting ZEB standards, developers must also participate in National Grid's Residential New Construction Program ([https://www.nationalgridus.com/media/pdfs/resi-ways-to-save/ee6174\\_ri\\_newconsprogram.pdf](https://www.nationalgridus.com/media/pdfs/resi-ways-to-save/ee6174_ri_newconsprogram.pdf)) and will work closely with program partners throughout the design, construction, and data collection phases.

### **Outcomes to Date**

**Round 1:** Funding awards were announced at the December 2019 Board meeting. An RFP was released in July 2019 with initial funding of \$250,000 available. In response to the strength of applications, the RIHousing Board approved an additional \$375,000 to fully support the three projects that will produce a range of building types in rural, suburban and urban parts of the state.

**Round 2:** The 2021 ZEOS funding round sought to expand the program, build upon the lessons learned, and further accelerate the adoption of net zero energy homes for the affordable housing market. RIHousing and OER committed \$740,000 in funding to three developers to produce a range of building types. Round 2 funding awards were announced in December 2021. An RFP was released in May 2021 with initial funding of \$750,000 available. A portion of that amount, \$250,000, was made available thanks to the state's participation in the Regional Greenhouse Gas Initiative (RGGI).

Round 1 gave us a chance to analyze outcomes and identify the gap funding needed and how to be most impactful with these awards. Based on the lessons learned from the initial funding round, we were able to make some strategic changes to the 2nd round of funding: we took a more "scientific" approach regarding the amount of funds awarded.

In both rounds, we received submissions that were innovative and illustrated commitment to energy efficient projects that would deploy a range of methods, including new and emerging technologies, thoughtful design, and sustainable building materials to meet program goals while creating a pathway for scaling ZEBs in low- and moderate-income residential sectors as a means of reducing greenhouse gas emissions.

Sheridan Small Homes located in Providence, RI, completed construction of 5 units in December of 2021. 2 units in Middletown RI are anticipated to start construction on May 15, 2022. 3 units in Jamestown are anticipated to start construction later this year.

### **Next Steps**

In addition to funding these kinds of developments, our goal is to also inspire other developers and communities to adopt a net zero approach to their work and provide real-world and replicable examples. We've highlighted the outcomes to date via a range of vehicles, including media announcements and the deployment of program signage at funded developments. **Developers recognize they can reduce long-term operating costs by making the buildings energy-efficient, but they need the funding and programmatic support to make these projects happen.**

Looking ahead, we hope to take the lessons learned from these ZEOS-funded developments to:

- look more closely at construction processes, advanced materials, and novel business practices related to energy equity;
- share our experiences and lessons learned more broadly to support the program's goal of replicability;
- strengthen collaborations; and
- break down existing barriers to developing net zero buildings.



RIHousing  
Rental: MultiFamily Management  
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Net Energy Affordable Homes

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## Program Partners



STATE OF RHODE ISLAND  
**OFFICE OF  
ENERGY RESOURCES**

**nationalgrid**

[About RIHousing](#)

[About the Rhode Island Office  
of Energy Resources](#)

[About National Grid](#)

[Click here to see all ZEOS funding awards >](#)

## Outcomes to Date

### Sheridan Small Homes



The vision for Sheridan Small Homes was to demonstrate that it is economically feasible to build affordable housing to high sustainability standards and that people want to live in smaller homes. ONE|NB believes that everyone deserves to live in a healthy, high-quality home regardless of income. This project sought to address an issue of environmental justice, where lower-income communities are often hardest hit by infrastructure pollution, yet they are rarely the ones to reap the benefits of sustainable innovations.

Sheridan Small Homes was intended to serve as a pilot build to test this concept while providing training on Passive Homes for all members of the design team that led to even more wide-reaching community benefits. This project also demonstrates the long-term viability of zero net-energy affordable housing while training the next generation of construction professionals in zero net-energy home construction.

## Bourne Mill



Bourne Mills III is a proposed new construction 59-unit apartment building in Tiverton, Rhode Island, to be located adjacent to the Historic Bourne Mill at 1 Mill St. The project has been awarded a preliminary Commitment of Low Income Housing Tax Credits (LIHTCs) which will provide funding for the bulk of the construction. The project has also been awarded a grant through the Building Homes Rhode Island Program and is expected to receive incentives through the National Grid Residential New Construction Program.

As part of the LIHTC process, the sponsor, The Armory Revival Company (TARC) committed that the proposed building would meet the stringent criteria of the Passive House certification program. At this point in the project development TARC has decided to expand the project with a photovoltaic system on a covered parking area adjacent to the building and on the available roof area of the building itself, which, along with some mechanical system upgrades, will enable the project to meet the Department of Energy's Zero Energy Home Program as a Zero Energy Building (ZEB). The Building will meet Energy Star Label criteria (HERS rated) and will qualify as High Efficiency Electric Homes. The project is also committed to exceeding Tier 2 of National Grid's Path to Energy Efficiency incentive levels, and it is hoped that Tier 3 will be achieved. RI Stretch Code is also expected to be met or exceeded.

We are seeking \$250,000 through this response to the Zero Energy for the Ocean State (ZEOS) RFP to support that effort. Due to this effort at achieving Net Zero additional funds must be secured and committed, and the Team requests that if additional ZEOS funds could be available, that all possible funds are awarded to the project.

The building will have 59 units of housing, 47 of which will be restricted to tenants that earn 60% or less of the Area Median Income (AMI). With successful participation in the ZEOS program TARC will also restrict the remaining 12 units to tenants earning 120% or less of AMI.

As can be seen on the Site Plan in Tab B of the Application, and the construction cost breakdown, four (4) dual EV charging stations are planned in the adjacent carport parking lot, with conduit installed to expand EV charging to the entire lot in the future.

This project we will create a replicable ZEB model for low- and moderate-income customers that will benefit future Affordable Housing Programs by way of example and experience and provide additional economic security for residents while also combating an increase of the greenhouse gases that contribute to climate change.

## Brookside Terrace



Brookside Terrace I/II is a Dakota Partners, Inc. development of 96 units of new affordable housing in the Town of East Greenwich, RI. Brookside Terrace is built as a first phase of a planned two phase development on a vacant 17.2 acre site. Brookside Terrace Phase I/II will consist of 4 slab on grade, wooden framed three-story residential buildings with 48 affordable units (“Building A”, “B,” “C,” “D” and a single story clubhouse/community building. The total building area will be approximately 84,000 SF.

The project will incorporate several types of green infrastructure including water conserving fixtures or features, no VOC paints, high efficiency furnace, energy star lighting and appliances. The development of Brookside Terrace resulted in minimal tree removal given the sites rocky terrain. Brookside Terrace will be furnished with an enhanced landscape plan and robust vegetation.

Brookside Terrace was constructed to all the PHIUS + standards and is expected to be one of the first Passive House developments in the state of Rhode Island. This was done so under the guidance, efforts of highly experienced PHUIS consultants. The design of Brookside Terrace was reviewed by Kaplan Thompson Architects who is also acting as the PHIUS Consultant and Certifier. The HVAC system was carefully third party reviewed by Steven Winter Architects. The development has been under the careful oversight and inspection of Jeremy Dagold, CPHC of Clear Result who has helped ensure that we stay on track for Clear Result Tier 3 verification. Drew Bourne, a Certified Passive House Builder headed our construction team.

Brookside Terrace will be built to the most ambitious energy conservation program in the world using the Passive House methodology. This is a very challenging and innovative effort that will lead to the lowest energy consumption of any program we know of. The estimated energy consumption of the project will be ~14.8 kBtu / SF / year (approximately 15 EUI). This is incredibly low energy consumption, the average existing multifamily building in the northeast currently consumes 75 kBtu / SF/ year.

Brookside Terrace has already implemented high efficient electric heating and cooling systems using air-source heat pumps, and will implement high performance ventilation systems and stringent air sealing techniques as guided by the PHIUS+ (Passive House US) Certification Program.



## Lockwood Plaza

### A1) Project Overview:

Building operations produces 35% of the carbon emissions in the United States. In order to meet aggressive federal climate goals, we must construct only zero-carbon buildings AND retrofit 5% of buildings annually (roughly 4 million buildings) to be super-efficient, all-electric, and grid-interactive. This fact is clearly accepted in the Rhode Island Zero Energy Task Force's Zero Energy Building Pathway to 2035 white paper, underscoring the importance of decarbonizing existing buildings. However, despite tremendous efforts to reduce emissions and save energy, typical energy efficiency work performed across the multifamily industry to date consists of low-hanging fruit and single-technology measures such as LED lighting, non-invasive air sealing, refrigerators, and gas boilers. These traditional energy conservation measures have been done again and again, with moderate or limited long-term impacts to energy and carbon emissions. To achieve decarbonization goals, the multifamily housing industry must quickly incorporate next-generation approaches and technologies that can achieve at least 50% energy savings and better prepare buildings, and the grid, for building system electrification.

As a national owner and operator of both for-profit and non-profit mixed income multifamily housing, WinnCompanies, and the non-profit, for-profit, private and public owners it serves, need solutions **now** for reducing portfolio level carbon emissions quickly and efficiently. With support from Rhode Island Housing and Office of Energy Resources, this Project, led by Winn's Energy and Sustainability division, Open Market ESCO LLC, seeks to design, explore, inform, and assess a scalable and replicable ZEB solution for **existing** low-rise affordable multifamily properties, while reducing long-term costs, eliminating fossil fuels, training a diverse workforce, and improving the health and well-being of vulnerable communities. Achieving net zero in existing buildings is tremendously more challenging than in new construction; however, given two-thirds of all buildings that exist today will still exist in 2050, existing building deep energy retrofits are critical for achieving market transformation and meeting climate emission goals. More specifically, the Project intends on designing, implementing, and monitoring an all-electric deep energy retrofit scope of work at four demonstration buildings comprised of four units each (16 units total) located at Lockwood Plaza Apartments, an existing Winn owned affordable housing community located at and around 50 Prairie Avenue in Providence, Rhode Island.

In Rhode Island, excess power generated from solar PV may be transferred to other utility accounts in the same owner's name. Because the post-retrofit electricity load is anticipated to be relatively low, and split between owner and tenant paid accounts, maximizing available roof area for solar will require transferring excess solar production to other house meters at Lockwood Plaza. The proposed solar PV will completely offset the house electric load on all four ZEB buildings, with excess power (approximately 33,350 kWh) transferred to other Lockwood Plaza accounts.

## E-Blast Communications

Promotion of available funding shared with a broad range of partners, municipal entities, non-profits and state agencies.

**rihousing + OFFICE OF ENERGY RESOURCES**

**ZERO ENERGY OCEAN STATE**

**Funding Available:**  
**Zero Energy for the Ocean State**  
Application Deadline: 5 p.m. Friday, July 30, 2021

**IMPORTANT PROGRAM UPDATE!**  
ZEOS Program Partners have extended the RFP Question Submission deadline for the 2021 ZEOS round of funding to July 12, 2021. Questions must be submitted to [zeosprogram@rihousing.com](mailto:zeosprogram@rihousing.com).

**RI Housing, the Rhode Island Office of Energy Resources (OER) and National Grid** seek proposals from qualified teams to design and construct affordable, energy efficient Zero Energy Building (ZEB) housing units to serve low- and moderate-income residents in Rhode Island.

The Program Partners are offering a total of \$750,000 for the development of these units. The total award cannot exceed \$250,000 for any individual project. The housing units must employ solar PV and air-source heat pump (ASHP) technologies to achieve ZEB status. The units may be new construction and/or renovation projects.

This program is the result of a collaborative approach by the program partners to expand ZEB housing to low- and moderate-income sectors. Complete details can be found in the [ZEOS Request for Proposals \(RFP\)](#).

**APPLICATION PROCESS:**

- The RFP and RFP documents are posted on the RI Housing website at <https://www.rihousing.com/rfp-zeos/>.
- Incomplete applications and those omitting requested documentation will not be evaluated.
- Each applicant submitting a proposal to ZEOS must include one electronic copy and one paper copy of a full application including drawings, specifications, and originals of each document on the checklist on pages 10 through 16 in the RFP.

**APPLICATION SUBMISSION:**  
All applications are due by 5:00 p.m. on Friday, July 30, 2021.

**RFP REQUIREMENTS:**  
A summary checklist of requirements is included on pages 10 through 16 of the RFP. Each applicant submitting a proposal to ZEOS **must include one electronic copy and one paper copy of a full application including drawings, specifications, and originals of each document on the checklist on pages 10 through 16**. The full electronic copy that follows the checklist, including an electronic version of the Development Proforma (sources and uses tabs at a minimum) and Contractor's Cost Breakdown, **must be uploaded to RI Housing's SharePoint site**.

Contact Carlos M. Morales at [cmorales@rihousing.com](mailto:cmorales@rihousing.com) for login credentials and instructions on how to upload your submission to the SharePoint site.

Submit the hard copy using three-ring binders with tabs dividing the sections per the checklist of requirements on pages 10 through 16. Submit to RI Housing, 44 Washington Street, Providence, Rhode Island 02903-1721, Attn: ZEOS Program, Development, RI Housing.

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**RFP Timeline**  
RFP Issued: May 26, 2021  
RFP Question Submission Deadline: July 12, 2021  
RFP Submission Deadline: Friday, July 30, 2021 at 5:00 pm

**RFP Documents**

- [ZEOS RFP](#)
- [ZEOS Development Proforma Template](#)
- [ZEOS Contractors Cost Breakdown Template](#)
- [ZEOS Self-Scoreing Template](#)
- [ZEOS Construction Requirements Checklist](#)
- [2021 Income Rent Charts](#)

Questions regarding the RFP should be submitted to [zeosprogram@rihousing.com](mailto:zeosprogram@rihousing.com).

RI Housing, 44 Washington Street, Providence, RI 02903  
[unsubscribe.manage@rihousing.com](mailto:unsubscribe.manage@rihousing.com)

## Signage

Signage at ZEOS funded sites allows us to further promote the program and raise awareness of this public-sector partnership.

**ZERO ENERGY**  
**for the**  
**OCEAN STATE:**

A COLLABORATIVE PROJECT TO PROMOTE AFFORDABLE, REPLICABLE NET ZERO HOUSING.

THIS DEVELOPMENT WAS FUNDED BY:

**rihousing + OFFICE OF ENERGY RESOURCES**

[www.RIHousing.com](http://www.RIHousing.com)

## Media

[Read the Press Release here](#)

### Select Media Coverage

- [Gov McKee, Office of Energy Resources, RI Housing announce zero-energy housing funds](#)
- [R.I. Housing, OER to offer grants for energy-efficient affordable housing](#)
- [RI Housing and R.I. Office of Energy Resources funding awards will support the development of zero net energy housing for R.I.](#)