The Energy Innovation Fund for Mid-Sized U.S. Cities
Sponsored by the Leon Lowenstein Foundation

Proposal Application Form

Proposal Title: Alternative Solar Financing for Multifamily Housing

Amount Requested: $61,786

Term: 12 months

Proposal Purpose: To establish and complete proof of concept of a rooftop solar installation model that will directly reduce utility bills for residents of unsubsidized affordable housing.

Local Government Lead: Stacie Reece, Sustainability Program Coordinator
City of Madison - Office of the Mayor, Room 403, City-County Building 210 Martin Luther King, Jr. Blvd., Madison, WI 53703; sreece@cityofmadison.com; 608-261-9823

Project Manager: Vito Greco, Director Solar Program
Elevate - Company Address: 322 S. Green St., Chicago, IL 60607; Local Address: 17 S Fairchild St FL 7, Madison, WI 53703; vito.greco@elevatenp.org; 773-328-7011

Participants:

- **Community Partner:**
  Common Wealth Development - Ashley Gohlke, Director of Development Operations
- **Local Government Partners:**
  Dane County - Kathy Kuntz, Director of Office of Energy & Climate Change
  City of Middleton - Kelly Hilyard, Sustainability Coordinator City of Middleton
  Sustainability Leaders Collaborative of Dane County
- **Technical Partners/Consultants:**
  Elevate - Abigail Corso PE, Chief Strategy Officer & Vito Greco, Director of Solar Programs
  Sustain Dane - Claire Oleksiak, Executive Director & Valora Gutierrez, Efficiency Navigator
  RENEW WI - Sam Dunaiski, Distributed Resources Director & Michael Vickerman, Policy Director

Team Composition:

City of Madison is considered a leader among the municipalities in Dane County to demonstrate sustainability process and policy for other municipalities to replicate. For this initiative, the City of Madison, Dane County Office of Energy & Climate Change, and the City of Middleton will work more closely together on a core team advising, reviewing, and evaluating the project. The completed case study will be presented at the Sustainability Leadership Collaborative which consists of 23 municipalities that meet quarterly to learn and implement sustainability best practices. With partnerships across community organizations, technical expertise and municipal energy efficiency and housing goals, this team is uniquely positioned to successfully envision and implement the project.

Elevate and Sustain Dane (SD), both nonprofit organizations, have been working together for over one year in Dane County to implement and scale the naturally occurring affordable housing Efficiency Navigator program (Navigator program) to reduce energy use, access incentives and financing, and improve resident safety and comfort.[1] Elevate and SD will provide overall project management and technical assistance related to financial modeling and installation of the rooftop solar and are ready to integrate and scale the project within the existing framework of the Navigator program. Elevate & SD's work directly aligns with the City of Madison's city-wide goals of increasing energy efficiency in affordable housing. The City of Madison recently received a grant from the Wisconsin Public Service Commission - Office of Energy Innovation (OEI) to expand the Navigator program in a neighborhood-based model in the Northside of Madison this summer. Solar is an area not included in the OEI grant and is critical for City of Madison to reach our sustainability goals. The Energy Innovation grant would build on this strong partnership to pilot equitable solar financing opportunities to build into the Navigator program and serve as an example for other communities.

Common Wealth Development is a community-based non-profit housing organization that provides affordable rental housing opportunities to low and moderate-income households through the ownership and management of 146 apartments that vary in size from studios to 3-bedrooms. Common Wealth Development serves low-income residents, is currently involved in the Efficiency Navigator program to evaluate energy efficiency opportunities and savings for residents in their properties. They are interested in rooftop solar and we have begun feasibility analysis. Funding from the Energy Innovation grant would make this possible.

RENEW Wisconsin is the leading renewable energy policy organization in the State of Wisconsin and will provide guidance on policy implications as well as statewide education and outreach about the project. Through their MadiSUN and Solar for Good grant programs, they have worked with subsidized affordable housing projects to bring solar to them. The unsubsidized multifamily market has remained a challenge to address and through this grant will be working on the policy needed to open this market more broadly.

Proposal Narrative.

- **Actionable:** The proposed project is intended to 1) reduce the utility bills of residents of unsubsidized affordable multifamily housing by installing rooftop solar, 2) create a replicable financial model with multiple sources of capital that overcomes barriers that have prevented solar market on multifamily in our region to-date. The work products will include: a replicable financial model, installation of a small rooftop solar system on one building to show proof of concept, engagement and collaboration with residents, and a case study outlining the results. Each of these work products will be broadly distributed by the project partners and the model will be incorporated into the existing Efficiency

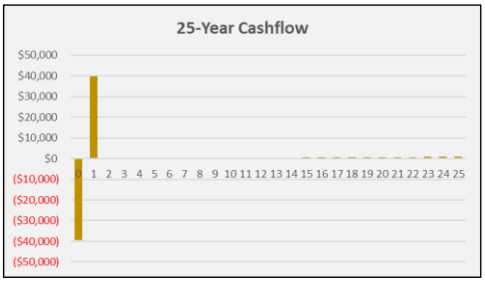
[1] Naturally occurring affordable housing is unsubsidized housing typically comprised of small and medium sized multifamily buildings occupied by residents earning less than 80% of the area median income. NOAH housing comprised over 50% of the affordable housing stock in the City of Madison.

Navigator program, inform RENEW Wisconsin grant programs, amplify positive impact to residents, and to serve as an example for building owners participating in that program.

Background: Too often rooftop solar on multifamily buildings only offsets electricity use for common areas, such as hallway or exterior lighting, and does not directly reduce residents' utility bills. The approach proposed for this project is to develop a viable financial model and value sharing mechanism to ensure benefits are shared and cashflow is positive for everyone. This includes installation of rooftop solar that is owned by Common Wealth Development, the building owner, but is individually connected to each tenant meter, as well as the common meter. The full electricity load of the property is covered by solar and everyone shares the value of the energy generated commensurate with their average annual electricity usage. Residents agree to small increases in rent that are calculated to ensure a 60% savings on their electricity costs. This overcomes the common barrier of a split incentive by creating a financial scenario for an owner to invest in solar, share the value, and recoup the costs. This project will leverage local incentives, partially monetized tax equity, this Energy Innovation grant that buys down 50% of the installation cost, as well as an operating loan provided by this project team. The loan terms are expected to be 3% over 10-15 years. This patient capital is important in proving out this concept. For many potential projects, the value and capital stacks may change based on the regulatory structure or access to tax benefits, incentives, and capital. Access to patient capital through this program, along with our value sharing approach, will allow us to reduce or eliminate future grant funding to make these projects pencil out without sacrificing resident savings. It also ensures both property owners and residents see positive cashflow from day-one.

We intend to complete proof of concept on a Common Wealth Development property located at 2009 Leland Avenue in Madison, WI which is going through an Efficiency Navigator energy assessment and energy efficiency improvements. Preliminary modeling shows a positive cashflow and sound investment returns for the property owner based on the solar investment:

Property Owner Financial Performance		
25-Year Costs:	$	($51,149)
25-Year Revenues:	$	$63,383
25-Year Net Benefits:	$	$12,234
25-Year Net Present Value (NPV):	$	$5,937
Return on Investment (ROI):	%	23.9%
Internal Rate of Return (IRR)	$	6.9%
Upfront Costs	$	($39,340)
Average Annual Revenue	$	$489
Payback Period:	years	1.0



Additionally, the residents see a 60% savings on the cost of their electricity. This value may shift in subsequent replication of this model as the value and capital stacks sources evolve. But the aim will always be to provide significant savings (at least 50%) to residents. Each unit in this property will receive energy produced from the solar system based on their average annual electricity usage and will pay a small, proportionate rent increase, resulting in measured savings immediately:

Tenant Savings Summary:

	Common Load	Unit 1	Unit 2	Unit 3	Unit 4
Percent of total system	6%	26%	41%	12%	15%
System size share in KW	0.9	3.7	5.7	1.7	2.1
Total current electricity cost annually	$405.00	$748.56	$996.78	$507.90	$560.82
Annual rent increase		$179.42	$278.71	$83.16	$104.33
Monthly rent increase		$14.95	$23.23	$6.93	$8.69
Total electricity cost reduction annually with solar	$105.00	$448.56	$696.78	$207.90	$260.82
Annual net savings		**$269.14**	**$418.07**	**$124.74**	**$156.49**
Monthly net savings		**$22.43**	**$34.84**	**$10.40**	**$13.04**

- **Achievable:** Rooftop solar installation on small multifamily buildings can be difficult because roof space is typically small. Even where roof sizes offer significant solar capacity, common loads are often so small it's difficult to justify the expense. In some regulatory areas, meter aggregation or community solar offer ways to share the energy. These regulatory structures do not exist in Wisconsin and only in a minority of states and utility territories nationally. The grant allows us to create and prove a model that makes it financially possible to install rooftop solar on smaller multifamily buildings and, importantly, extends the installation to include residents' meters. This opens an important sector of the affordable multifamily market to solar, increasing the overall number of solar installations while providing access to low-income residents to renewable energy that will directly reduce their monthly bills. This grant will provide funding to test this financial model with a solar installation on an affordable housing multifamily building in partnership with Common Wealth Development, a Madison-based nonprofit housing developer. Low-income residents in Wisconsin typically pay 8-10%[2] of their income for utilities. This community-oriented approach to increasing access and benefits of renewable energy will also increase overall education, engagement and success with implementing renewable systems for small, affordable multifamily buildings and their residents. This will also lead to valuable findings and data that can be used to accelerate solar access in the housing sector and will be critical for reaching scalable climate solutions.

- **Impactful:** To create a viable model with proof of concept that shows low-income residents can directly access renewable energy that decreases their monthly expenses and the diversified capital that can support this work. It will open the door for other similar installations in low-income housing. The project team will measure the success of the project according to the following key performance indicators and method of measurement:
    - Overall reduction in monthly costs to residents measured by tracking resident electric bills and rent with success measured by a reduction in monthly costs. Residents are expected to see a 60%savings on the cost of their electricity, which translates into an average 33% savings off their overall electricity bill (after including fixed costs, taxes, and fees).
    - kW produced by renewable energy will be tracked through capacity monitoring of each rooftop system with success measured by system performance.

[2] Source: https://www.energy.gov/sites/prod/files/2019/01/f58/WIP-Energy-Burden_final.pdf

- Carbon reductions will be tracked based on overall reduction in energy use and applying the U.S. EPA greenhouse gas calculator as well as AVERT, U.S. EPAs Avoided Emissions and Regeneration Tool with success measured by an overall reduction in CO2 equivalents.
- Residential and owner satisfaction will be measured via engagement, interviews, and a questionnaire at the start and end of the program with success measured by a 90% satisfaction rating and qualitative feedback.
- Financial model meets Common Wealth Development needs so that by end of program they (or another developer) are in planning stages for a second building using this model.

- **Innovative:** This concept addresses several significant barriers to deploying rooftop solar on small, affordable multifamily buildings: 1) the split incentive between owner and resident, 2) access to capital for small affordable property owners or nonprofits, and 3) direct access to the value and benefits of renewable energy by low-income families. The use of diverse sources of funds and metering strategy will provide proof of concept to other funders interested in access to clean energy for low income residents. The City of Madison has over 40,000 units of unsubsidized affordable housing of which half are in buildings less than 10 units in size.[3] The ongoing work of the Efficiency Navigator program shows that many of these buildings have not been upgraded for efficiency or rooftop solar. Coupling this project within the existing Navigator program will help ensure energy efficiency upgrades are prioritized and it will accelerate renewables deployment on this growing pipeline of affordable housing properties. The Navigator program is well positioned to implement and scale this model because of its focus on serving this critical housing stock, engaging these difficult to reach owners, engaging residents, and providing technical assistance and support around these complex issues.

- **Scalable:** The case study developed with this grant funding will directly inform enhancements to the Efficiency Navigator Program, and the RENEW Wisconsin policy work and grant programs which are currently operating across Dane County as well as in other locations in WI, but have not currently been serving the market of installing rooftop solar on small affordable multifamily housing. The Efficiency Navigator program has conducted solar opportunities for 158 units of affordable multifamily across Dane County, many of which are ready to move forward with solar through replication of the financing model that would be developed with this grant. The OEI grant beginning in summer 2021 will provide funding for energy efficiency and resident engagement with an additional 80 units similarly poised to potentially use this solar financing model. Outside of Dane County, Eau Claire, WI is interested in including the Navigator program in their community, and both Elevate and Sustain Dane are committed to expanding the Navigator model statewide. With matching funds exemplified in this grant, we can show how to supplement local dollars with philanthropy and financing to assist cash strapped municipalities achieve solar goals equitably for all residents. The City of Madison will present a workshop to the Sustainability Leaders Collaborative that brings together 23 leaders from local governments from across Dane County. The Sustainability Leaders Collaborative

[3] Analysis completed by Elevate using American Community Survey census data and the National Housing Preservation database.

facilitates information sharing and collaboration around clean energy. All members of the Sustainability Leaders Collaborative will be able to use this deliverable and the workshop meetings will be a productive vehicle to spread the information to these other local governments, in particular the financial model of how to move forward with solar in multifamily with limited resources. Results will be also communicated through the partner networks of SD, Elevate, Common Wealth Development and RENEW Wisconsin including via their newsletters, social media, and annual conferences. Common Wealth Development is a trusted affordable housing developer and leader in the community – they will provide education and information about the program to other affordable housing developments. Storytelling of the resident's perspective and impact to them from the solar will be an important part of the communications. Elevate, as a national organization, will communicate the model to others in their network working in this field such as such as Kansas City, MO; Detroit, MI; or Portland, OR.

- **Transformative:** When implemented, the project will provide a financial model and blueprint for municipalities and affordable housing owners to provide access for low-income residents to renewable energy giving those residents greater agency over their energy bills and inclusion in the developing clean energy economy. This approach is transformative because the solar industry in emerging markets such as Wisconsin are not likely to innovate by themselves. The momentum of the industry across the country is to provide PPAs with a 10% to 20% savings. Where that does not work, little presence or innovation is seen. Mission-driven actors need to test the limits of our current regulatory framework and offer innovative solutions that the industry can adopt. Proving a concept like the proposed financing model case study is the first step in making the solution visible. The installed rooftop solar panels on affordable multifamily housing will be visible to the community at large and the assembled project team has the local, state, and national networks of decisionmakers to talk about the project. RENEW Wisconsin has a deep understanding of Wisconsin policy and how this project will fit into the WI policy landscape. With this completed case study and the potential for significant annual resident yearly savings (estimated $125-$418 for this pilot), this has the potential to serve as an innovative and replicable approach to increasing owner likelihood of adopting solar, and extending solar savings to residents. Tenants will see a 60% savings on the cost of their electricity. While every unit will see different savings overall based on the variations in their energy usage, all tenants will see a 60% savings of their electricity costs. Fixed utility costs and fees are not affected. After including fixed fees and small rent increases, residents will save 33% off their total electric bill. Similarly, the owner Common Wealth Development will see a positive cashflow and immediate savings.

- **Comprehensive:** The families in the 2009 Leland Ave Common Wealth Development property receiving solar will participate in education and engagement around solar efficiency and financial savings. In addition to utility savings, they will receive a stipend of $500 for their engagement. Equity is central to the Efficiency Navigator program and this project will build onto the existing work that Common Wealth Development, SD & Elevate have been doing to educate, hear feedback and compensate residents who are involved in the Efficiency Navigator program. The case study property

is in the Meadowood Neighborhood in Madison, WI. This is one of nine buildings that CWD owns in the Meadowood neighborhood, and across their properties in Meadowood there are 85 residents, of which 32 are children, across 33 households. The residents in these homes are racially and ethnically diverse with 56 identifying as Black/African American, 6 as Asian, 17 as Other, and 6 as White. Five residents identify as Hispanic, 68 as Non-Hispanic, and 12 did not respond. Eighty percent of the households are female single head of household with children. A successful project will be deployment of a model that financially directly benefit residents and provides access and inclusion of low income black and brown renters to benefits of renewable energy. When residents are energy burdened because of high utility bills, those households have higher rates of eviction, destabilizing families and communities. Reducing building utility costs and resident utility burden through this project will help stabilize housing prices for families and keep them in their homes.

- **Local Buy-in:** The project team will lead a local stakeholder engagement process that will include up to 20 interviews with residents, community leaders, local municipalities, state regulators, and housing developers to gather input about the project approach and preliminary financial model. Feedback from these groups will provide critical information about changes needed to the model to ensure it is viable for affordable housing developers and residents acting within the constraints of affordable housing policies and processes as well as housing typologies and existing financing structures that might present barriers or opportunities to broad deployment.

Management:

Table 1. Schedule of Deliverables and Payments

#	Activity	Deliverable	Due Date	Payment by Source and Recipient
1	*Activity 1: Develop financing model for rooftop array on naturally occurring affordable housing based on local housing data*	*Deliverable 1: Financial model spreadsheet with sensitivity analysis*	*August 15, 2021*	*50% upfront: $30,893 to the City of Madison*
2.	*Activity 2: Obtain input on the model comprised of stakeholders representing local government, affordable housing owners, and residents*	*Deliverable 2.1: Stakeholder interview guides* *Deliverable 2.2: Conduct interviews and provide summary memo of results of interviews including recommended model changes* *Deliverable 2.3: Adjustment to the financial model, if needed*	*2.1: August 15, 2021* *2.2: October 1, 2021* *2.3: October 1, 2021*	
3.	*Activity 3: Deploy rooftop solar and test financial model on one naturally occurring affordable housing building in Madison, WI*	*Deliverable 3.1: Plans and specifications for rooftop solar system* *Deliverable 3.2: Proof of deployment*	*3.1: September 1, 2021* *3.2: December 31, 2021*	

#	Activity	Deliverable	Due Date	Payment by Source and Recipient
4.	*Activity 4. Measure energy production, in-unit and building wide energy usage*	*Deliverable 4.1: Energy production and consumption analysis* *Deliverable 4.2: Actual financials for the proof of concept building*	*4.1: March 1, 2022* *4.1: March 1, 2022*	
5.	*Education and outreach*	*Deliverable 5: Case study*	*June 1, 2022*	*50% at project close: $30,893 to City of Madison*
	Project Administration	*Quarterly reports* *Final report*	*October 1, 2021* *January 1, 2022* *April 1, 2022* *July 2, 2022*	

Deliverables and Associated Budget:

Labor		Lead	Support	Elevate	SD	Renew	Total	Budget
Activity 1: Develop financing model for rooftop array on naturally occurring affordable housing based on local housing	Deliverable 1: Financial model spreadsheet with sensitivity analysis	Elevate	Renew	8		8	16	$ 2,080
Activity 2: Obtain input on the model comprised of stakeholders representing local government, affordable housing owners, and residents.	Deliverable 2.1: Stakeholder interview guides	Sustain Dane	Elevate Renew City		12		12	$ 1,560
	Deliverable 2.2a: Conduct interview	Sustain Dane			48		48	$ 6,240
	Deliverable 2.2b: Summary memo of results of interviews including recommended model changes	Sustain Dane/	Renew	2	10	2	14	$ 1,820
	Deliverable 2.4: Adjustment to the financial model, if needed	Elevate	Renew	12	2	6	20	$ 2,600
Activity 3: Deploy rooftop solar and test financial model on one naturally occurring affordable housing building in Madison, WI	Deliverable 3.1: Plans and specifications for rooftop solar system	Elevate		8		4	12	$ 1,560
	Deliverable 3.2: Proof of deployment	Elevate		20		10	30	$ 3,900
Activity 4. Measure energy production, in-unit and building wide energy usage	Deliverable 4.1: Energy production and consumption analysis	Elevate		32			32	$ 4,160
	Deliverable 4.2: Actual financials for the proof of concept building	Elevate	Renew	16		8	24	$ 3,120
Activity 5: Education and outreach	Deliverable 5: Case study	Sustain Dane	Elevate Renew City		16		16	$ 2,080
Project Management	Project Administration	Elevate		32	8	8	48	$ 6,240
				130	**96**	**46**	**272**	**$ 35,360**
		SUBTOTAL LABOR						**$ 35,360**
Expenses								
	Travel			100 miles				$ 56
	Stipend and resident engagement for households			4 families				$ 2,000
	Solar installation (after grants and incentives)			15 KW system				$ 24,370
			SUBTOTAL EXPENSES					**$ 26,426**
			TOTAL PROJECT BUDGET					**$ 61,786**