

2024 PROJECT PEER REVIEW

U.S. DEPARTMENT OF ENERGY
BUILDING TECHNOLOGIES OFFICE

BTO Peer Review:

B-Biz: Building Business Network

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National Renewable Energy Laboratory

WBS: 2.2.2.61

Photo by NREL



**High-performance building technologies
by high-performance businesses.**

Project Summary

OBJECTIVE, OUTCOME, & IMPACT

B-Biz collaborates with local small businesses who supply high-performance building technologies in communities with the lowest rates of adoption. By demonstrating innovative business model solutions, B-Biz aims to address barriers in the market and improve the speed and scale of adoption.

FY24 Scope was to understand market barriers and develop a program plan.



TEAM & PARTNERS

- National Renewable Energy Laboratory (NREL)
- Green Home Doctors, Bay View Construction & Design, and Zero Homes
- Washburn Forward Together (community coalition)
- Bayfield County, WI
- Input from local organizations like Cheq Bay Renewables, energy offices at Red Cliff and Bad River Tribes, Jolma Electric, Focus on Energy, and other local and state stakeholders.

STATS

Performance Period: 10/1/2024 to 12/31/2025

DOE Budget: \$500k, Cost Share: \$0*

Milestone 1: B-Biz Needs Assessment Memo (Complete)

Milestone 2: B-Biz Program Proposal (Complete)

Milestone 3: B-Biz Pilot Program Results (12/15/24)



Problem

- Homes and buildings account for 35% of U.S. CO₂ emissions with only 2% of homes and buildings undergoing deep retrofits each year.
- 281 million additional decarbonization measures need to be implemented in buildings by 2030 to meet U.S. goals.
- **Despite innovations in building technologies, contractors are not implementing these technologies at necessary speed and scale.**

“Eight in 10 employers in energy efficiency are small businesses with fewer than 20 employees.”

–DOE Blueprint 2024



Business Model Innovation Needs

Effective business model innovation benefits both investors and end users, supporting contractors in high-performance building technologies that encourages business growth and meeting goals.



Market Risks for Small Businesses

The high-performance building technology market poses high perceived risks for small businesses, as the market risks of energy efficiency may outweigh the potential benefits for building owners.



Barriers in the Local Market

Small businesses providing and servicing high-performance building technologies face barriers around supporting customers in financing, policy, workforce, maintenance, and more.



Value of Small Businesses

Small businesses, with direct community impact, can more effectively promote new technologies and support accelerated market growth. However, these businesses need support to participate in a rapidly changing market.





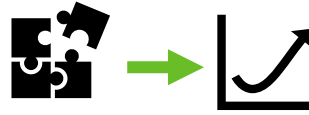
Program Plan

The program plan for B-Biz was informed by:

- Published research.
- Conference working session.
- Industry perspectives from over 40 interviews with market stakeholders.
- Summer 2024 case study.

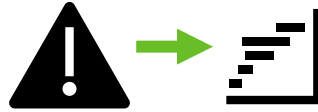
NREL “developed the program to pair mentorship with on the ground deployment of new business models in partnership with national technical assistance providers and an ongoing network support program. This is so exciting!! We at the Building Performance Partnership (BPP) have heard the mentorship relationships are so incredibly valuable - never underestimate the ability to have someone to call instead of only static online resources.” - **Ella Wetlesen from Institute from Market Transformation**

Goals of B-Biz :



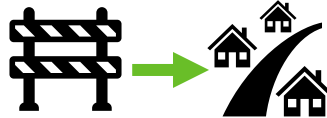
Change Market Behavior

Identify and communicate findings, best practices, and novel solutions to the buildings industry and larger market.



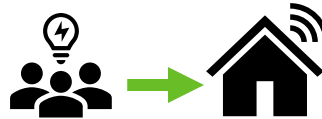
Document Business Models

Empower small businesses through collaborative efforts in their local markets.



Assist Underserved Communities

Focus on where the risk and market gap may be even more pronounced in underserved communities with low rates of high-performance building technology adoption.



Increase High-Performance Tech

Demonstrate accelerated speed and scale of high-performance technology adoption.



B-Biz Alignment With National Buildings Blueprint



Reduce U.S. building emissions 60% by 2035 and 90% by 2050 vs. 2005 while enabling net-zero emissions economy-wide and centering equity and benefits to communities.

B-Biz collaborates with local small businesses who supply high-performance building technologies in communities with the lowest rates of adoption. By demonstrating innovative business model solutions, B-Biz aims to address barriers in the market and improve the speed and scale of adoption of new technologies.



Prioritize equity – B-Biz delivers benefits to small business who will deliver at scale to underserved communities.



Prioritize affordability – B-Biz uses the business model language to focus on cost structure and revenue streams to meet the local market.



Prioritize resilience – B-Biz supports local resilience by supporting the small businesses that would assist a community in recovering from stresses.

Win for
Contractors

Win for
Communities

Win for the
Climate

“We need the contractors and workforce to implement projects, there’s a big gap between the projects and resources available and who’s going to build them.” - **Bill Bailey, President, Cheq Bay Renewables**

Building Business Network (B-Biz)

B-Biz collaborates with small businesses who provide or service high performance building technologies in communities with low rates of adoption.

Business model development as a key focus and benefit for cohort participants to develop profitable businesses around high-performance building technologies, while supporting local markets for emerging technologies.

Utilize “apprenticeship model” through mentorship to share best practices and troubleshoot.



Program Structure

B-Biz collaborates with small businesses who provide or service high performance building technologies in communities with low rates of adoption.

Cohort

WHO Small businesses who provide or service high performance building technology

DURATION 6 month business-related projects to produce findings for the larger industry

Network

WHO Industry stakeholders engaged in the high performance building technology market

DURATION Ongoing, open admission for all interested in learning from cohort findings



Iterative process with frequent and consistent feedback to DOE on findings related to commercialization.

Stakeholder engagement as part of convenings with network through regular meetings, events, and documentation that will be shared publicly and quickly as part of ongoing findings.

Develop relationships with partners in the field who can deploy the next iteration of technology advancements and are ready to adapt to a changing market.

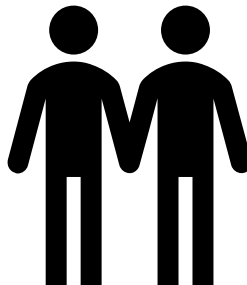




Mentoring Relationship

Mentor:

Demonstrated success in deploying novel business models around high-performance building technology and small businesses.



Mentee:

Interested in supplying more high-performance building technologies or improving their business practices.

Goals of Mentorship

Transferring Industry Knowledge – Sharing of industry knowledge, business model successes, best practices.

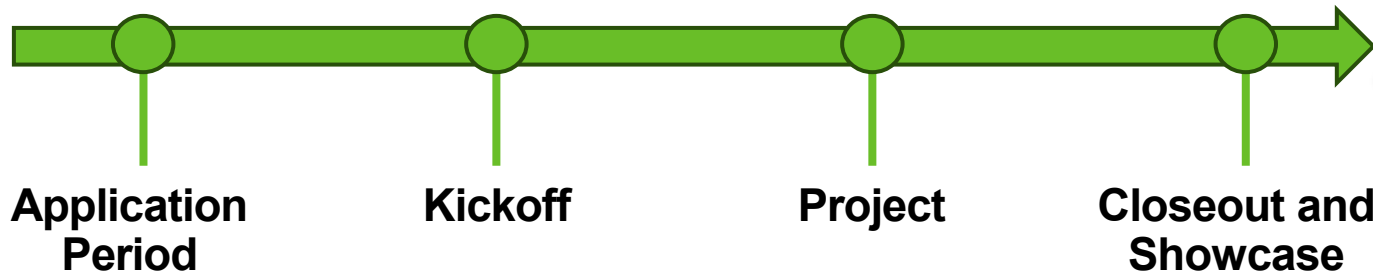
Collaboratively Addressing Barriers – Identifying challenges that contractors are facing, demonstration of ways of addressing said challenges.

Adapting to Market Changes – Evolving contractor skillsets as the sectors evolve to install emerging technologies.



B-Biz Cohorts

- Cohorts range in the number of participants and the central topic or focus.
- Cohorts generally take place over ~6 months for long-term sustainable change in underserved communities with the following timeline:



Application Period

Recruit and review applications for upcoming cohorts.

Kickoff

Evaluate participant's business model to identify opportunities for innovation and determine plan for demonstration.

Project

Explore novel or innovative business model approach with regular updates and support from mentor and NREL.

Closeout and Showcase

Evaluate the demonstration project and participants present on findings from their projects and experience in the B-Biz program.

Increased adoption of high-performance building technologies



Supporting Small Business Contractors

<p>Key Partners</p> <ul style="list-style-type: none"> Facilitate relationships between small businesses and relevant partners at the community, county, state and national level Invite potential partners to engage in cohorts Request iterative feedback to engage partners and build relationships Share new and innovative technologies and product suppliers Share technology demo results and key findings to reduce risk of implementation 	<p>Key Activities</p> <ul style="list-style-type: none"> Expand scope of work of contractors to include high-performance technologies Receive peer and/or mentor feedback on work such as deliverables or approaches Evaluate current activities for avenues to implement industry best practices 	<p>Value Propositions</p> <ul style="list-style-type: none"> Provide workshops around defining value proposition clearly to communicate to market Practice sales pitch and building customer relationships with cohort participants Receive modeling or analysis technical assistance to support technology value proposition, especially in local economies Explore avenues to add value to current business around high-performance technologies 	<p>Customer Relationships</p> <ul style="list-style-type: none"> Provide coaching for cohort participants Share best practices for strengthening customer relationships Identify community-based and regionally specific approaches 	<p>Customer Segments</p> <ul style="list-style-type: none"> Analysis or market landscape and suggestions on how to expand Identify disengaged customer segments and pathways for engagement Peer learning on available customer segments Research on federal and state funding to identify supported customer segments
<p>Cost Structure</p> <ul style="list-style-type: none"> Receive Financial Readiness training and support by the Small Business Administration Provide tools and guidance for business cost modeling to support business Identify best practices for cost structuring related to small businesses in this market, including successful business models 	<p>Revenue Streams</p> <ul style="list-style-type: none"> Learn about new product lines for new revenue streams Identify strategies for businesses to easily identify revenue streams related to new and emerging high-performance technologies Develop or utilize tools small businesses to de-risk new revenue streams 			



Progress Summer 2024 Case Study: Washburn, WI

Washburn:

- Small rural town of 2,000 residents.
- Company town for DuPont, which left in 1971.
- Spend more on energy than the average U.S. customer (Open EI).
- Community is very engaged.



Matt Danielson

Green Home Doctors

Participant

Project Interest:

- Only certified energy auditor in the area.
- Facilitating incentives and funding for low-income, remote, and tribal residents.
- Solutions for local workforce shortage.



Roth Edwards

Bay View Construction & Design

Participant

Project Interest:

- Business model planning for growing their business into whole-home energy efficiency and related services.
- Working with non-English speakers.



Grant Gunnison

Zero Homes

Mentor

Mentoring Strength:

- Experience with business innovation and market transformation in underserved communities.
- Current and past participation in NREL and DOE programs.



Photo from Matt Danielson, Roth Edwards, and Grant Gunnison



Business Model Canvas: Bay View Construction & Design

Key Partners

- Isakssons Lumber Co.
- Other local suppliers
- Federal and State of Wisconsin Grant Awards
- Vanda Soares' circle of family and friends who are architects
- Visions First Reality

Key Activities

- Home repair jobs
- Design consultation and customization of New Engle houses
- Retrofit, renovation and rental of old houses
- Problem solving (figuring out each customer and project)

Value Propositions

- Professional service
- Quality work
- Fair price
- Customer co-create
- Biophilic, energy efficient design
- Customization of models offered

Customer Relationships

- Personal assistance
- Co-creation

Channels

- Office and store
- Website
- Partners
- Advertisements (signs at job sites, a brochure, business and rack cards)

Customer Segments

- Young families of 2-3 people
- Retirees
- Anyone who requires home repair
- Vacation rentals owners
- Campground owners

Key Resources

- Vehicles
- Building for storage
- Trailers and other tools
- Office/workshop
- Carpenters and laborers
- Architects
- Bank line of credit
- Partnerships
- Camper and/or motorhome

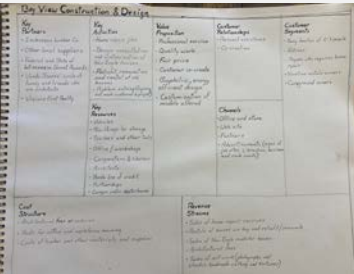


Photo from Roth Edwards

Cost Structure

- Architectural feed or salaries
- Rents for office and workforce housing
- Costs of lumber and other materials and supplies

Revenue Streams

- Sales of home repair services
- Rentals of houses we buy and retrofit/renovate
- Sales of New Engle modular houses
- Architectural fees
- Sales of artwork (photographs and Vanda's handmade clothing and knitwear)

<p>Key Partners</p> <ul style="list-style-type: none"> • Isaksson Lumber Co. • Other local suppliers • Federal and State of Wisconsin Grant Awards • <i>Vanda Soares' circle of architects</i> • Visions First Reality • Potential for partnership to connect with solar • Potential for Jolma Electric who needs to connect with a metal roof contractor • Potential for Bad River/Red Cliff Tribe – need for quality contractors • Business Plans Etcetera (BPE) – 3 phased business strategy 	<p>Key Activities</p> <ul style="list-style-type: none"> • Home repair jobs • Design consultation and customization (separate, architectural office) • Build, mass production and customization (per customer request) Terra Firma/modular houses retrofit, renovation and rental of old houses • Problem solving • Focus on specialization, particularly metal roofs 	<p>Value Propositions</p> <ul style="list-style-type: none"> • Professional service • Quality work • Fair price • Customer co-create • Biophilic, energy efficient design; doing more with less like the way nature builds • Customization of models offered • Quality, smart house that is architecturally designed and doesn't put customer into debt • Environmentally conscious and sustainable; virtue architecture 	<p>Customer Relationships</p> <ul style="list-style-type: none"> • Personal assistance • Co-creation • Education, educating customers around energy efficiency retrofits, benefits and modular building • Mass market approach instead of 1-at-a-time 	<p>Customer Segments</p> <ul style="list-style-type: none"> • Young families of 2-3 people • Retirees • Anyone who requires home repair • Vacation rentals owners • Campground owners • High end customers that can afford energy retrofits • Potentially Bad River Tribe, depending on Indian preference for contractors
<p>Cost Structure</p> <ul style="list-style-type: none"> • Architectural fee or salaries • Future goal: Rent/build for office • Costs of lumber and other materials and supplies • Workforce expense: Attorney fees for work visas and immigration (\$10k/person) + housing workforce (utilities) • Insurance: Workers' comp, business liability • Vehicle maintenance • Business plan feasibility study with Craig from BPE • Education + training 	<p>Revenue Streams</p> <ul style="list-style-type: none"> • Sales of home repair services • Metal roof sales and installation • Rentals of houses we buy and retrofit/renovate • Goal: Sales of modular houses • Architectural fees • Sales of artwork (photographs and Vanda's handmade clothing and knitwear) 			
<p>Channels</p> <ul style="list-style-type: none"> • Office and store • Website (need to develop, more polished/detailed) • Partners • Advertisements: Signs at job sites, a brochure, business and rack cards, newspaper ad, Facebook page • LinkedIn: Recently revised, added B-Biz participation • Finish business school degree to complete entrepreneurial business plan 				



Supporting Business Fundamentals

- A simple pricing model change and lead tracking can transform a business.
- Program mentor, Grant Gunnison, worked with participant, Roth Edwards, on a cost structure sheet to improve his revenue flow and support additional work.
- Start with “What does your business look like?” and made small but important short-term changes to yield long-term benefits, including:
 - Updating communication channels.
 - Reviewing pricing.
 - Creating a plan to hire more employees.
 - Identify strategies to increase volume of project bids.

	7/1/2024	8/1/2024	9/1/2024	10/1/2024	11/1/2024	12/1/2024
Metrics						
Project Bids	5	8	10	12	13	10
Conversion Rate	80%	80%	80%	80%	80%	80%
Project Hours	160	256	320	384	416	320
Employees Needed	1.2	1.9	2.4	2.8	3.1	2.4
Project Revenue						
Revenue	\$12,000	\$19,200	\$24,000	\$28,800	\$31,200	\$24,000
Cost of Services	\$5,039	\$8,062	\$10,078	\$12,093	\$13,101	\$10,078
Total Gross Profit	\$6,961	\$11,138	\$13,922	\$16,707	\$18,099	\$13,922
% Gross Margin	58.01%	58.01%	58.01%	58.01%	58.01%	58.01%
Corporate Expenses						
Operations	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Sales & Marketing	\$200	\$200	\$200	\$200	\$200	\$200
General & Admin	\$2,400	1200	1200	1200	1200	1200
EBIT	\$3,361	\$8,738	\$11,522	\$14,307	\$15,699	\$11,522

Marketing Channels		7/1/2024	
		Time Spent	Calls
Storefront (Grocery)			
Door Knocking			
Print Mail			
- Flyers			
- Postcards			
		8/1/2024	
		Time Spent	Calls
Storefront (Grocery)			
Door Knocking			
Print Mail			
- Flyers			
- Postcards			
		9/1/2024	
		Time Spent	Calls
Storefront (Grocery)			
Door Knocking			
Print Mail			
- Flyers			
- Postcards			

Growth 



Progress: Case Study Impact

Matt with Green Home Doctors



- Worked to create a link between contractors and rebates.
- Identified opportunities and challenges for contractors with the new rebate incentives.
- **Impact of Matt's involvement:**
 - ✓ Developed rebate-contractor best practices through exploring the process from a contractor point of view, creating relationship with Focus on Energy, creating a strategy for contractors/rebate providers to work together to roll out rebates.
 - ✓ Received \$100,000 to implement IRA rebates in homes in Chequamegon Bay from Focus on Energy.
 - ✓ Empowered to develop new partnerships.

Roth with Bay View Construction and Design



- Develop better business practices allowing him to provide energy efficiency solutions.
 - ✓ Estimate 2-3x increase in business volume through incorporating better practices, which will lead to higher revenues, opportunities to hire, and opportunities to expand business to take advantage of current opportunities.
- Worked on improving sales pitch to upsell customers on energy efficiency upgrades by promoting opportunities.
- **Impact of Roth's involvement**
 - ✓ Improved promotion of business and opportunities to fill in gaps in the market around energy efficiency services.
 - ✓ Connected with the local electrical contractor to jointly meet the market for metal roofs and solar PV, especially with expected influx of home retrofit projects.



Future Work: Full Launch of B-Biz



 **NREL**: Buildings Expertise + Community Knowledge
Transforming ENERGY

- Trade Unions → Group of organized small business that have the power to advance the industry
- Bilingual Contractors → Meet needs of Spanish-speaking communities
- Affordable Housing → Focus on rentals, multifamily, and HUD housing
- Tribal Contractors → Able to serve on tribal lands, especially supporting rebates and grants
- Connect to Contractors → **YOUR COHORT HERE!**

Sponsored cohorts with industry partners to test innovative concepts



Full Launch of B-Biz: The Network and Partners

Impact: Scale findings around business model innovations to others.

“It was because of the focus and refinement of the research and help from NREL [through B-Biz] that I was able to craft a response more in alignment with the needs of the market, the constraints discovered with the IRA rebates, and Focus on Energy.”

Matt Danielson, Green Home Doctors, Cohort Participant



Element	Focus for Full Launch
Launch B-Biz Network	Stakeholder network serves as a lighter option of engagement but connects findings regularly to both provide feedback to the program but also to get regular insights from the B-Biz cohorts. Include events or dedicated platform for networking.
Bring on New Partners	Add capacity to support the diversity of program participants and their needs: <ul style="list-style-type: none"> - DOE Office of Energy Justice and Equity (Money Smart for Small Business program). - Small Business Administration (SBA). - Supporting subcontractor in building industry. - Launch ‘Business Advisory Committee’ to inform program.
Publish Findings	Launch formal research effort publishing findings from B-Biz cohorts and share feedback on technology adoption of industry.

Thank you!



Transforming ENERGY

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National Renewable
Energy Laboratory

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BUILDING TECHNOLOGIES OFFICE

NREL/PR-5500-91438



B-Biz Participant Roth Edwards,
Bayview Design and Construction

Reference Slides for B-Biz





Resources

- 2023. “The US Might Need 1 Billion New Building Decarbonization Measures.” ICF. November 1, 2023.
- 2024. Open EI State and Local Energy Profiles.
<https://openei.org/wiki/StateAndLocalEnergyProfiles>. Accessed 3/15/24.
- 2024. Decarbonizing the U.S. Economy by 2050: A National Blueprint for the Buildings Sector. Washington, DC: U.S. Department of Energy.
<https://www.energy.gov/eere/articles/decarbonizing-us-economy-2050>
- 2024. The Building Business Network (B-Biz): Addressing Gaps in the High-Performance Building Technology Market, Especially for Underserved Customers. Denver, CO. Alexandra Kramer and Rachel Romero.
<https://research-hub.nrel.gov/en/publications/the-building-business-network-b-biz-addressing-gaps-in-the-high-p>



Project Execution

	FY2024				FY2025				FY2026			
Planned budget	\$400,000				\$750,000				\$250,000			
Spent budget	\$362,000				-				-			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Past Work*												
Q1 Milestone: Needs Assessment Memo	◆											
Q3 Milestone: B-Biz Program Plan			◆									
Q1 Milestone: B-Biz Pilot Program Results				◆								
Current/Future Work												
Q1: B-Biz Program Announcement				◆								
Q2: B-Biz Network Plan					◆							
Q3 Milestone: B-Biz Stakeholders						◆						
Q4 Milestone: B-Biz Interim Annual Summary of Successes							◆					
Q1 Milestone: B-Biz Final Annual Summary of Successes								◆				

- *FY24 Project was under the Tech to Market Portfolio



B-Biz Team at NREL

A cross-disciplinary team to deliver results across communities in buildings.



**Rachel Romero,
PE**

Senior Engineer

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**Alexandra
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**Sofia Garcia-
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Alyssa Bersine

Communications
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