

Downtown La Crosse Microgrid Feasibility Study & Resilience Planning

Adrian Rivera | Slipstream

February 9, 2026



Climate + Clean Energy Solutions for everyone.

The knowledge, people, and
resources to solve our biggest
energy challenges.



Introduction

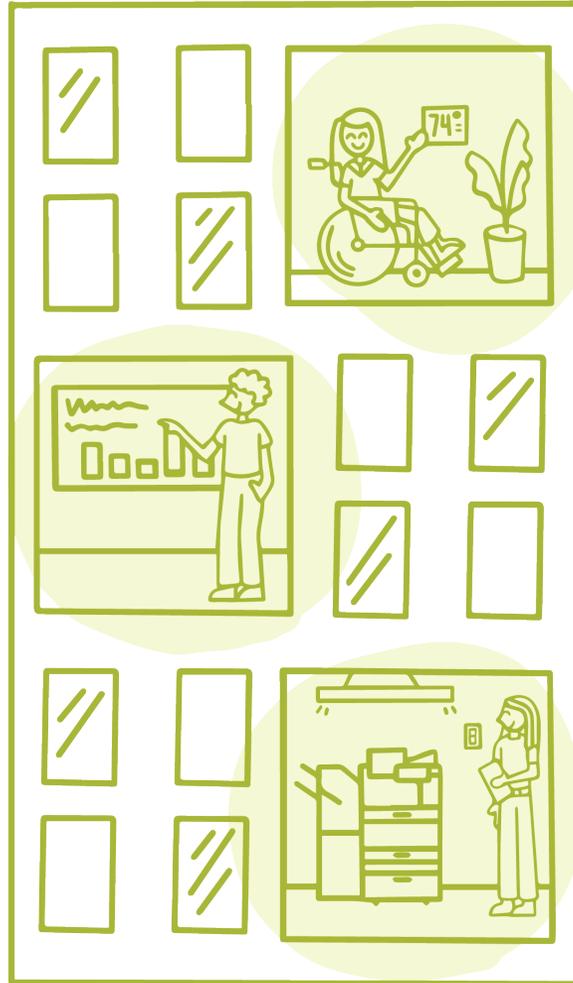
- Why Microgrids for La Crosse?
- Project Overview & Goals

Resilience Planning Framework

- Three-layer resilience framework
- Community Resilience Centers (CRCs)

Microgrid Concepts & Scenarios Evaluated

- Technologies considered
- Individual-building vs small campus microgrids
- Overview of scenarios



Key Results

- Financial Findings
- Looking beyond utility bill savings
 - Value of resilience
 - Value of emissions reductions & health benefits

Next Steps

- Key design and implementation considerations

Funding Opportunities

Key Takeaways

Discussion and Q&A



Introduction

Why Microgrids for La Crosse?

La Crosse, like many Midwest communities, is facing **increasing climate-driven risks**:

- Extreme heat and cold
- Intense storms and flooding
- Growing strain on aging electrical infrastructure

Microgrids are a **resilience strategy** that allows critical facilities to:

- Maintain power during outages
- Continue serving the community during emergencies
- Advance emissions reduction goals



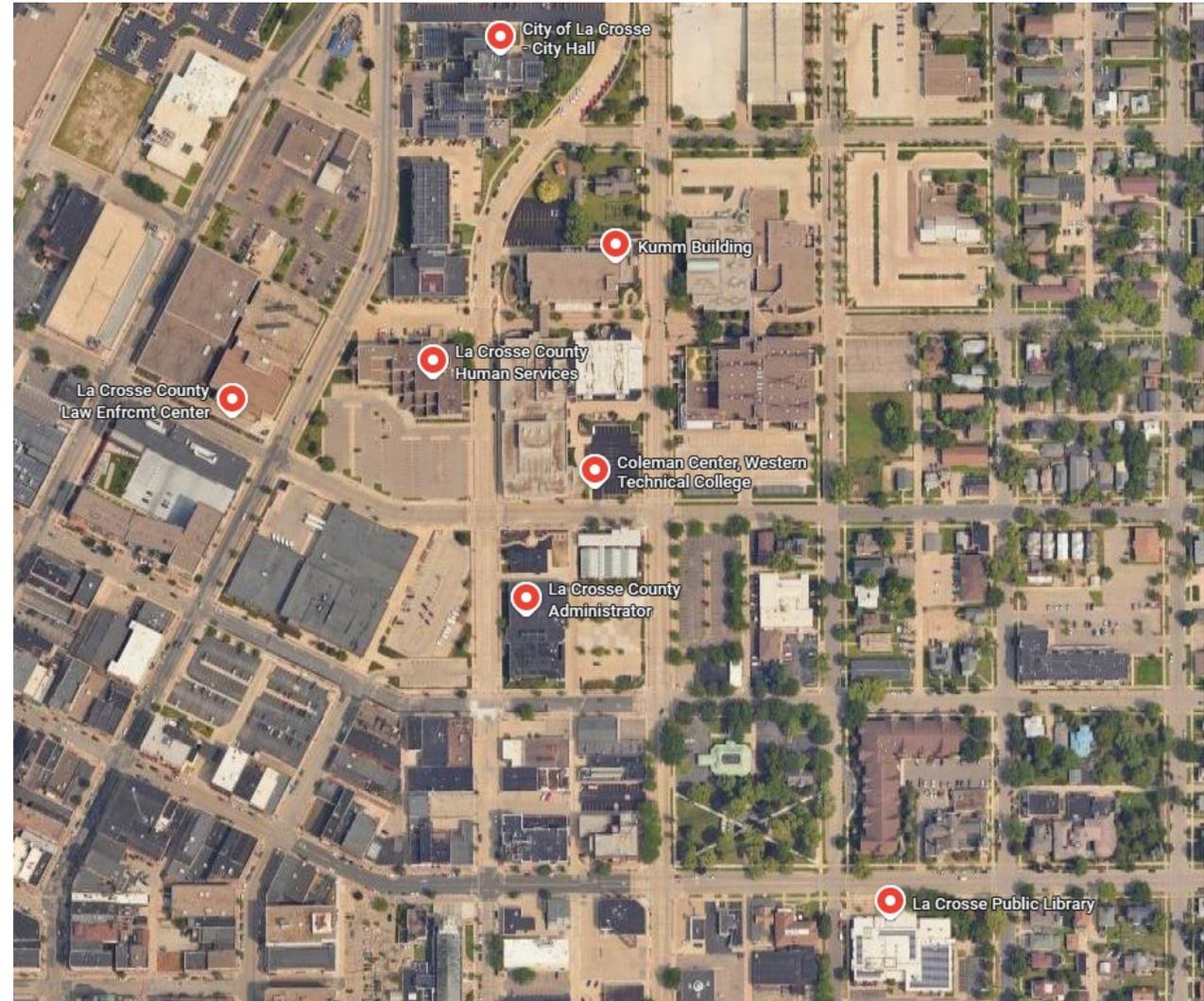
Project Overview and Goals

This study evaluated **seven downtown facilities** considered **community lifelines**:

- Support public safety and detention
- Health services
- Sheltering
- Emergency coordination and operations
- Information access

Our **goals** were to:

- Assess the **technical feasibility** of microgrids
- Understand **economic performance**, including non-traditional benefits
- Evaluate **resilience outcomes**, not just utility bill savings
- Provide **actionable guidance** for next steps





Resilience Planning Framework

Three-layer resilience framework

Engineering- designed Resilience

Robustness of physical infrastructure

- **Critical load support by DERs during extended power outage.** The capability of using local Distributed Energy Resources (PV, BESS, and/or generator) to support critical loads.

Operational Resilience

Management strategies and responsiveness during disruptions

- **Recovery time objectives (RTOs).** Ensure critical systems and community services are restored within target recovery timeframes following an outage or disruption.

Community Resilience

Social factors and community engagement

- Critical service availability
- Community accessibility and equity
- Community engagement
- Communication services reliability
- Community safety and essential services
- Community health benefits

Community Resilience Centers (CRCs)

CRC's are facilities designed to provide:

- Heating and cooling
- Refrigeration for food and medicine
- Charging for phones and medical equipment
- Basic shelter and services during outages



Based on site characteristics, accessibility, and existing programs, Western Technical College's Kumm Center emerged as a strong candidate for a CRC.

The Main Public Library was also identified as a potential **secondary or short-term resilience site**, especially for daytime support and information access.



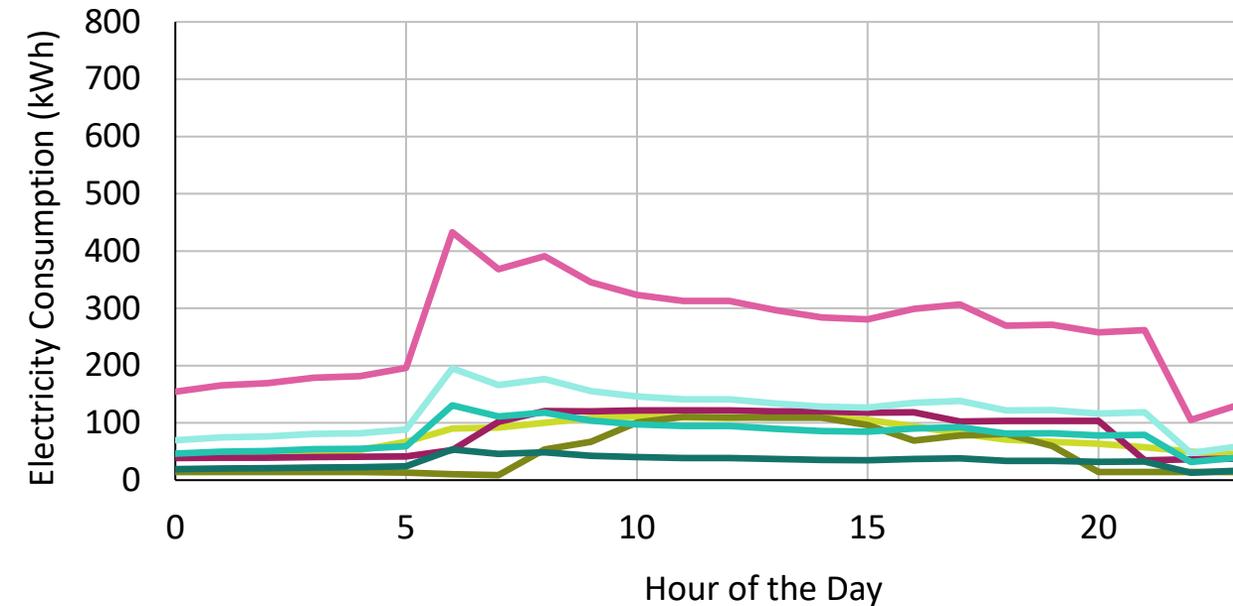
Microgrid Concepts & Scenarios Evaluated

Microgrid Concepts

Load Profiles

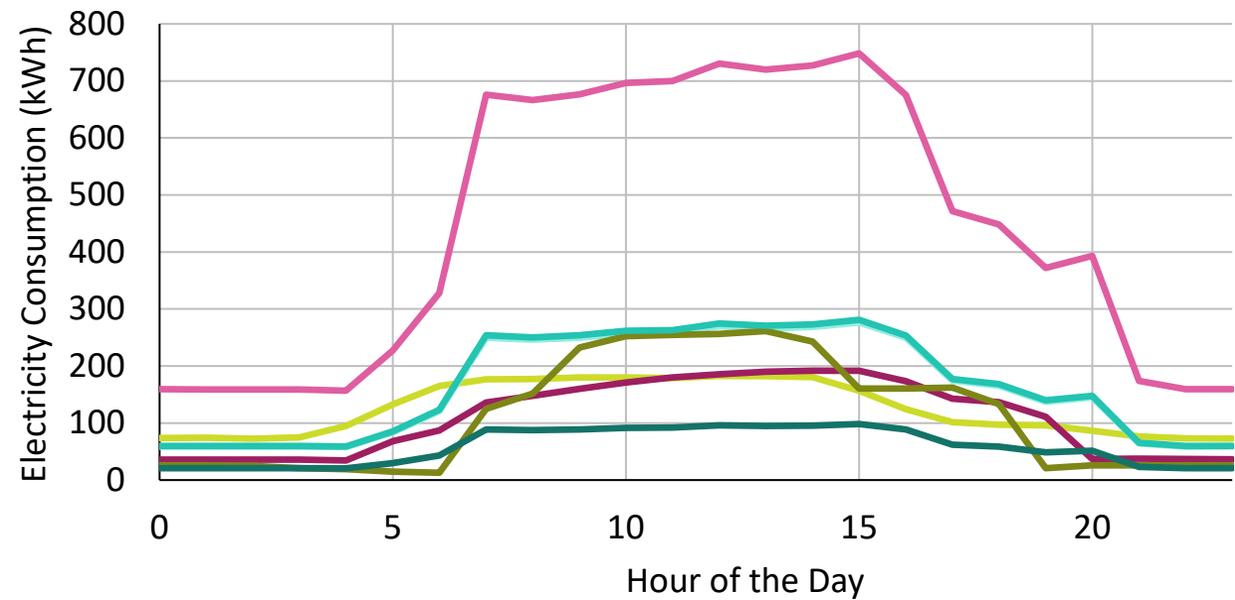
Built using a combination of real consumption data, standard load profiles, and energy models.

Winter Day



- Coleman Center
- City Hall
- Law Enforcement Center
- County Administration
- Kumm Center
- Main Library
- Health & Human Services

Summer Day



- Coleman Center
- City Hall
- Law Enforcement Center
- County Administration
- Kumm Center
- Main Library
- Health & Human Services

Microgrid Concepts

Technologies considered

- Existing and new solar PV
- Battery energy storage systems (BESS)
- Existing backup generators

Building name	Existing PV panels capacity (kW)	Annual Production (kWh/year)	Renewable electricity	Existing generator capacity (kW)
County Administrative Center	133	167,190	47%	60
Law Enforcement Center	255	321,553	11%	600
Health and Human Services	100	125,707	14%	350
City Hall	113	142,439	12%	80
Main Public Library	112	141,164	21%	15
Kumm Center	N/A	N/A	N/A	125
Coleman Center	N/A	N/A	N/A	130

Microgrid Scenarios

Individual-building vs small campus microgrids

Early in the project, we explored whether all seven buildings could be connected into a single downtown microgrid.

However, due to regulatory constraints multi-owner microgrids are currently difficult to implement in Wisconsin.

As a result, we focused on:

- **Individual-building microgrids**
- **Small campus microgrids**, where buildings share ownership and a meter

The campus approach proved to be both more feasible and cost-effective.

Microgrid Scenarios

Western Technical College

Building	Rooftop area for PV (ft ²)	PV capacity (kW)	BESS power capacity (kW)		
Coleman Center	19,017	142	65	130	
Kumm Center	14,238	190	75	125	230
Small Campus	33,255	333	135	255	290

La Crosse County

Building	Existing PV capacity (kW)	Potential added PV capacity (kW)	BESS power capacity (kW)	
County Admin	133	0	60	
LEC	255	246	400	600
HHS	100	0	100	350
LEC + HHS Campus	355	246	500	950

City of La Crosse

Building	Existing PV capacity (kW)	BESS power capacity (kW)	
City Hall	112	80	150
Main Library	113	35	135

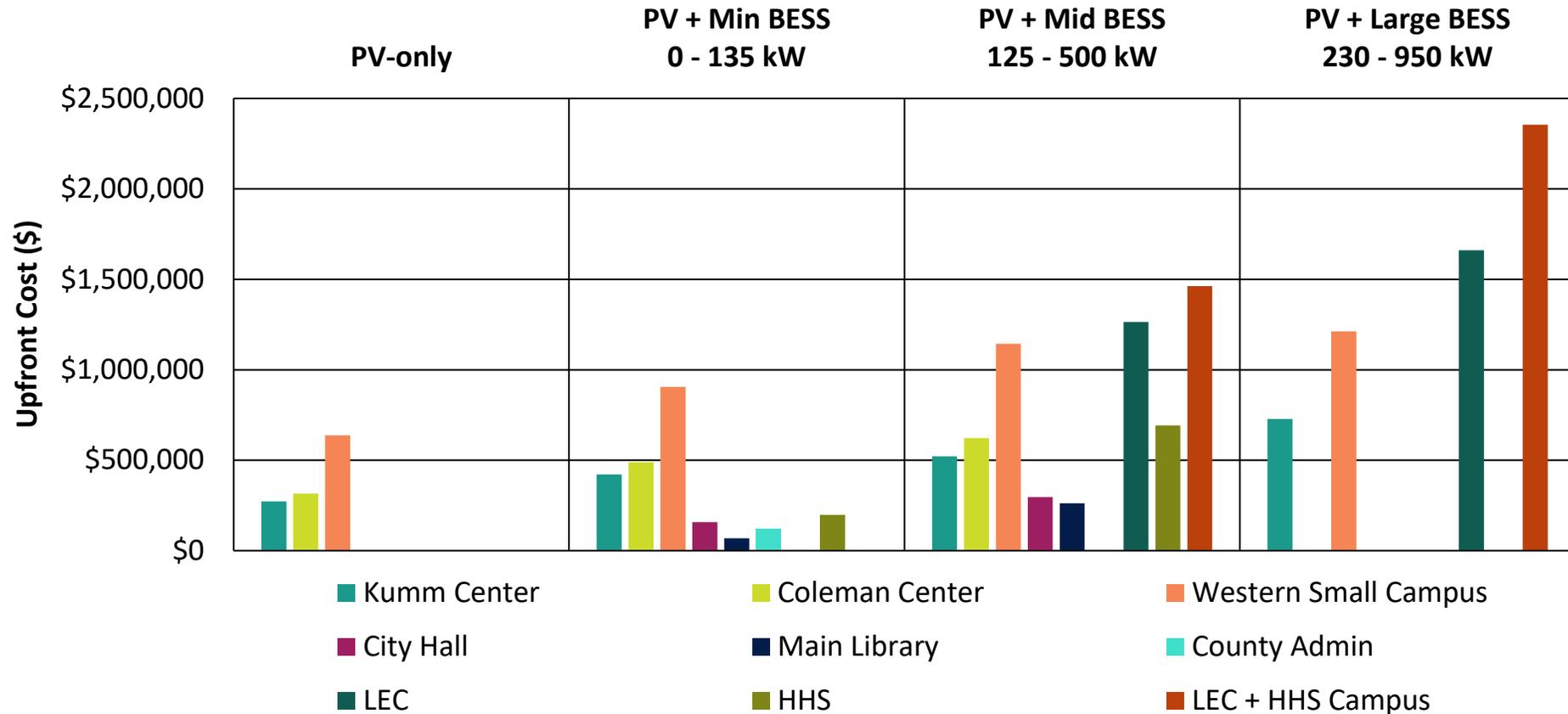
BESS energy capacity (kWh)
sized to 4 and 8 hours of resilience.



Key Results

Financial Results

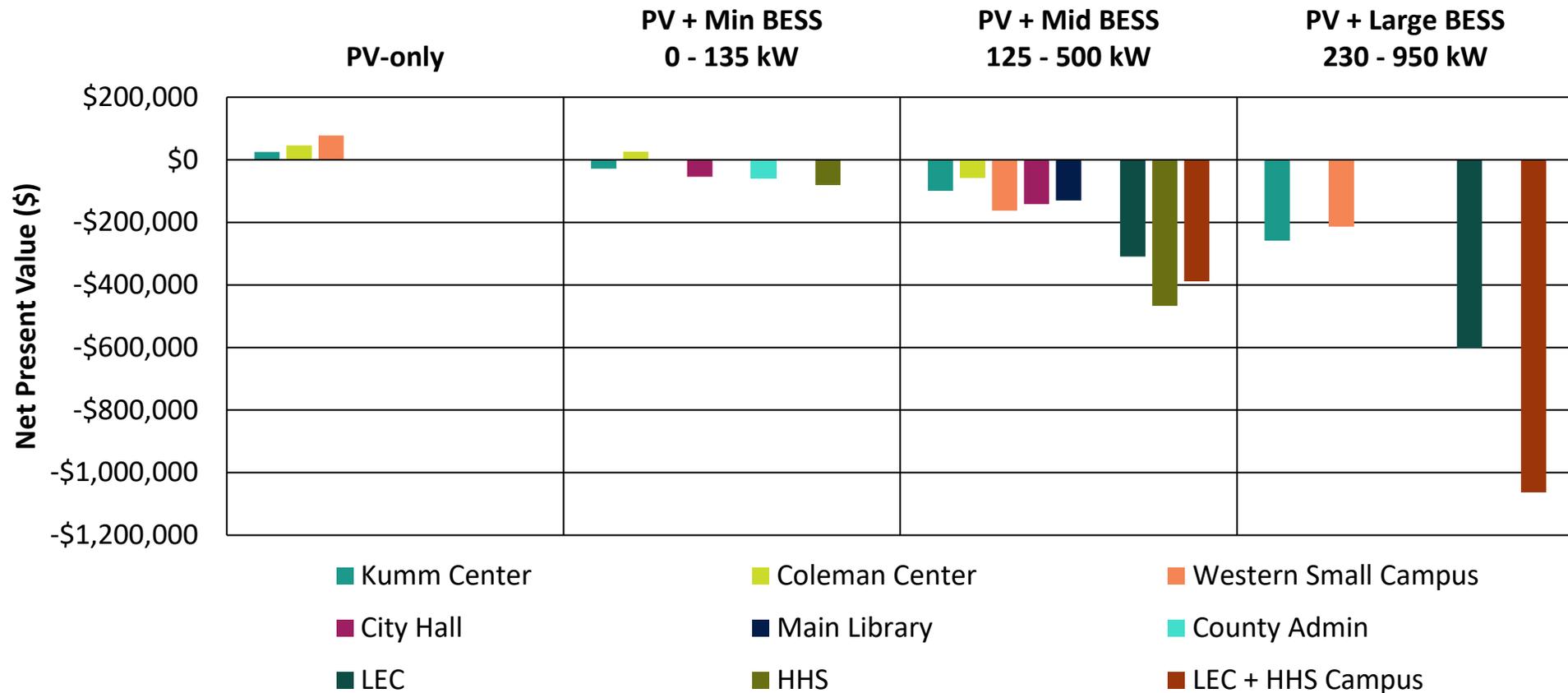
As additional PV and battery energy storage are incorporated to meet resilience objectives, upfront cost increases and traditional financial metrics weaken.



*All for four-hour capacities

Financial Results

As additional PV and battery energy storage are incorporated to meet resilience objectives, upfront cost increases and traditional financial metrics weaken.



*All for four-hour capacities

Value of Resiliency Measures

Based on a study from LBNL, the estimated cost per average kW (cost per event normalized by average demand) of a **one-hour outage for large commercial buildings is \$21.8 per kilowatt.**

For each scenario:

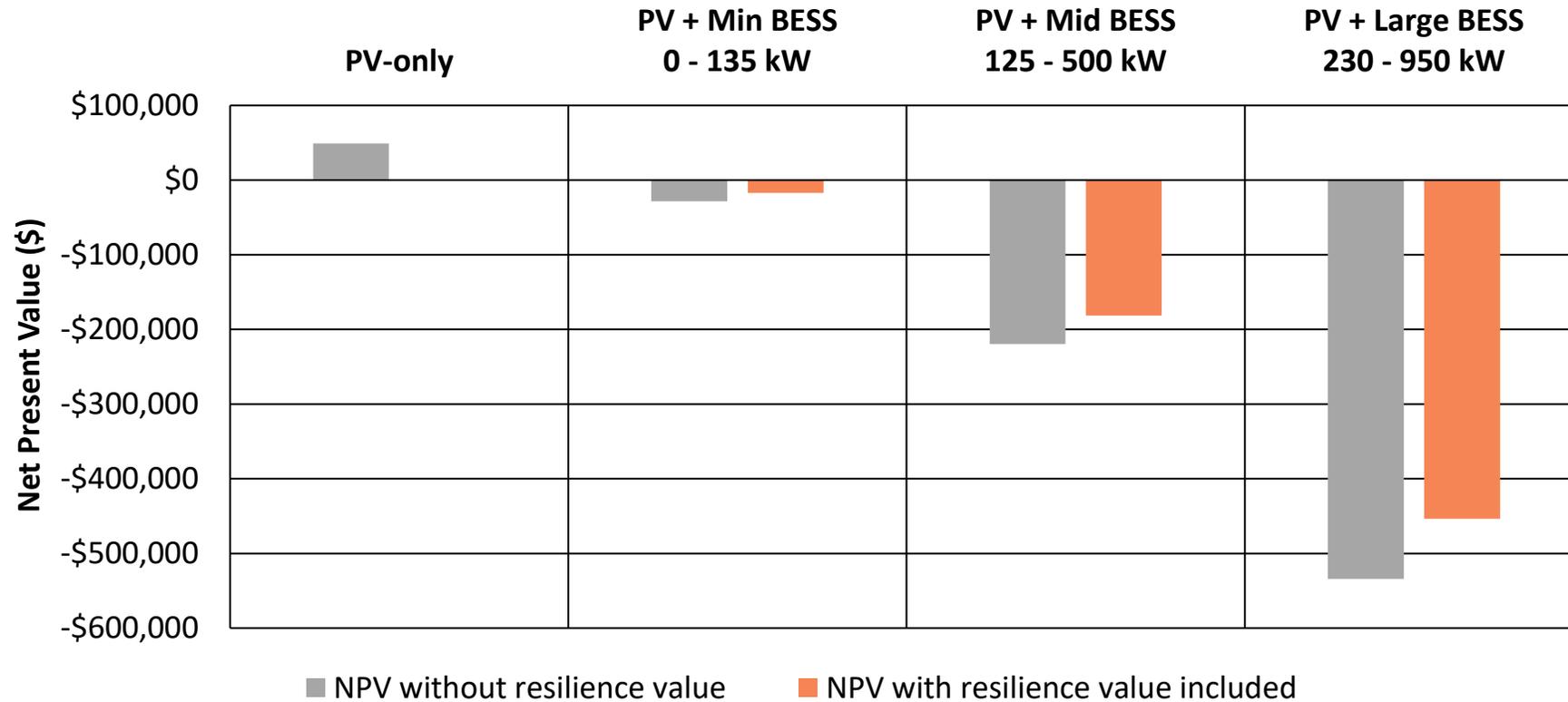
- The average critical load supported by the microgrid was calculated
- The assumed outage duration of 1-hour was applied
- The resulting avoided outage cost was aggregated over the project lifetime

This resilience value was then incorporated into the net present value analysis alongside traditional utility cost savings.

Resilience Value = Average Critical Load (kW) × Outage Duration (hrs) × Cost per kW-hour of outage



Value of Resiliency Measures



Value of Emissions Reduction and Public Health Benefits

Microgrids with solar PV and battery storage reduce emissions of carbon dioxide (CO₂) as well as harmful air pollutants such as nitrogen oxides (NO_x), sulfur dioxide (SO₂), and fine particulate matter (PM_{2.5}).

Reductions in criteria pollutants are associated with:

- Fewer asthma attacks and respiratory hospitalizations
- Reduced cardiovascular stress and premature deaths
- Lower public health system costs
- Improved quality of life, particularly for vulnerable populations

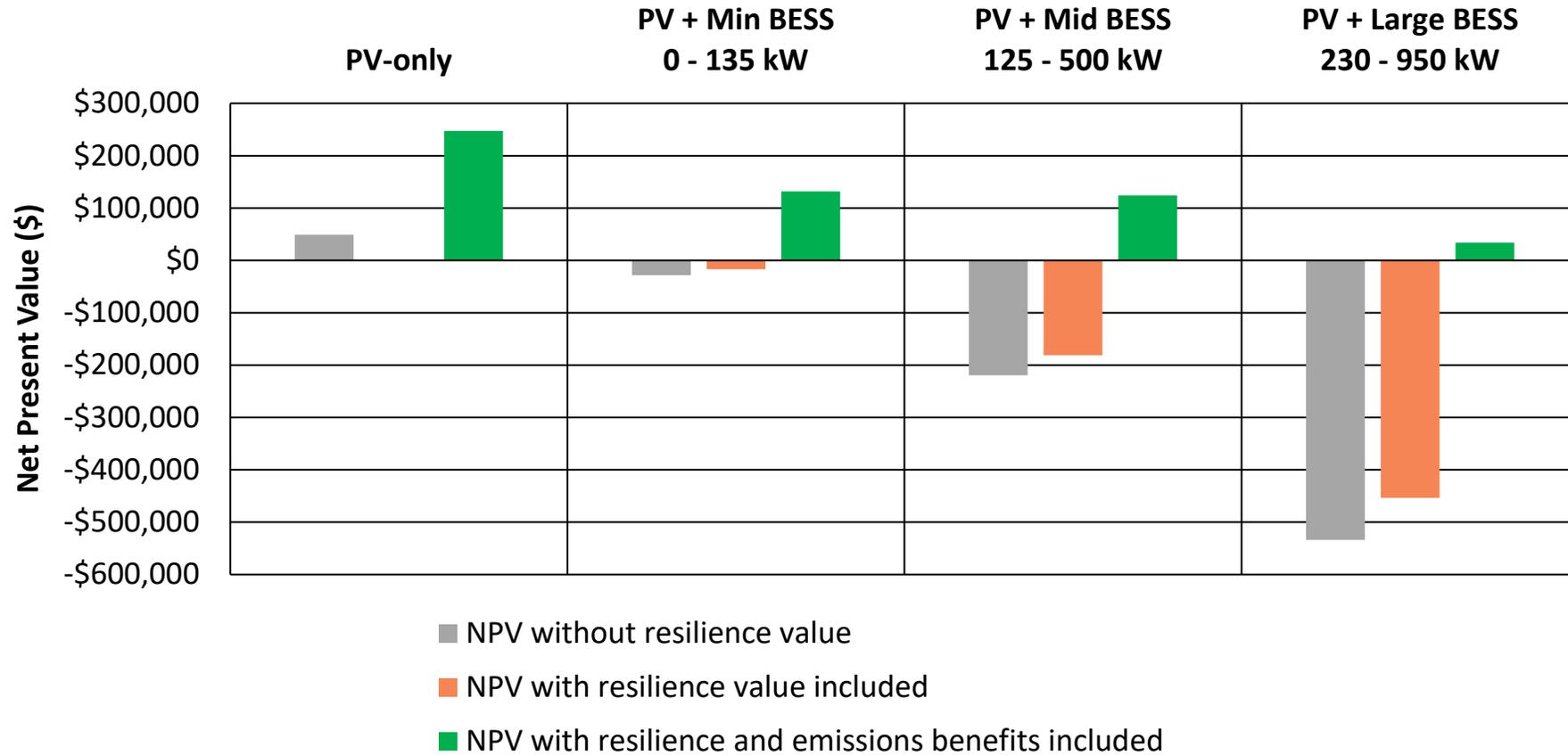
These benefits represent real societal value, even if they do not appear on a utility bill.

Pollutant	Removal cost per ton
Carbon dioxide (CO ₂)	\$51
Nitrogen oxides (NO _x)	\$20,505
Sulfur dioxide (SO ₂)	\$48,835
Particulate matter (PM _{2.5})	\$147,978

The values used in the analysis were selected from sources such as:

- The Interagency Working Group (IWG) on the Social Cost of Greenhouse Gases
- The Estimating Air Pollution Social Impact Using Regression (EASIUR) model from the Center for Air, Climate and Clean Energy Solutions (CACES)

Value of Emissions Reduction and Public Health Benefits





Next Steps, Funding Opportunities, and Key Takeaways

Design and Implementation Considerations

- Design **microgrid-ready systems** during renovations
- Prioritize and clearly define **critical loads**
- Integrate **existing generators** strategically
- Plan for **battery replacement** or augmentation
- Conduct early **site surveys** and interconnection discussions



Funding Opportunities

- **Inflation Reduction Act tax credits**, using direct pay for public entities
 - Solar PV projects must generally begin construction by July 4, 2026, or be placed in service by December 31, 2027, to qualify for the ITC or PTC.
 - BESS are eligible under the ITC and are not subject to the same placed in service deadline that applies to solar generation.
- Potential future rounds of the **PSC Energy Innovation Grant Program**
- **Focus on Energy** incentives for solar and efficiency measures



Key Takeaways

- Microgrids are **technically feasible** across downtown La Crosse
- Traditional financial metrics alone **undervalue resilience projects**
- Campus-scale systems offer the strongest pathways
- When resilience and emissions benefits are included, the value proposition improves substantially
- This study provides a **replicable framework** for future resilience planning





Discussion / Q&A



Contact Information



Adrian Rivera

Slipstream

arivera@slipstreaminc.org