



**SCEP**  
STATE & COMMUNITY ENERGY PROGRAMS

# Sources and Strategies for Clean Energy Financing

Larson Lovdal  
Energy Efficiency and Conservation Block Grant (EECBG) Webinar Series  
January 25, 2024

# Agenda

**1 High Level Key Concepts**

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**2 Overview of Common Financing Mechanisms**

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**3 Eligible Activities and Project Examples**

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**4 Ownership Models and Considerations**

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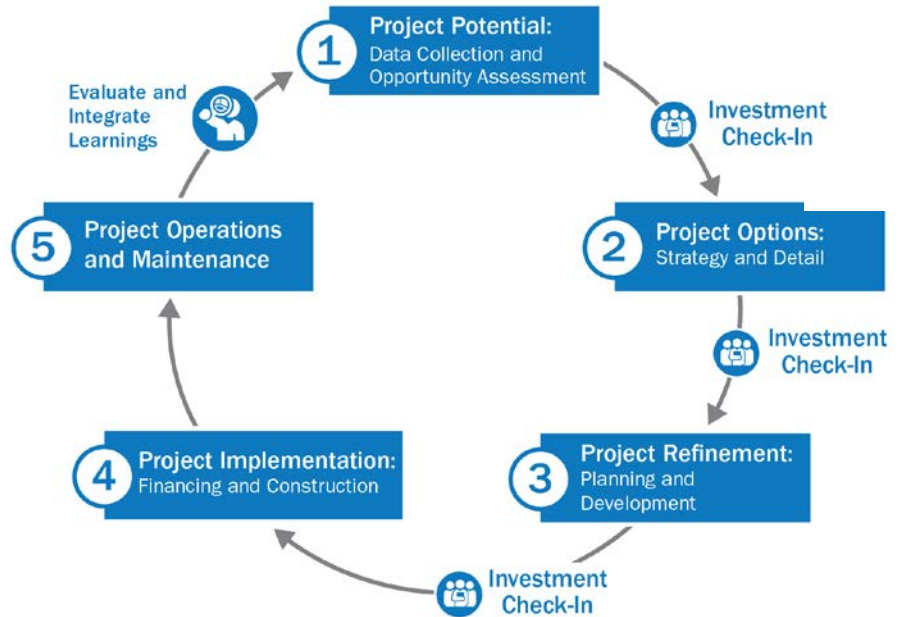
**5 Additional Resources**

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# Project Development Cycle

- Process of realizing a **specific, actionable solution** from **multiple options**.
- Project development is **iterative**.
- **Focuses on incremental investments** to progressively resolve **key risks**.
- EECBG funds will likely only cover a portion of this process but can help access additional financing.

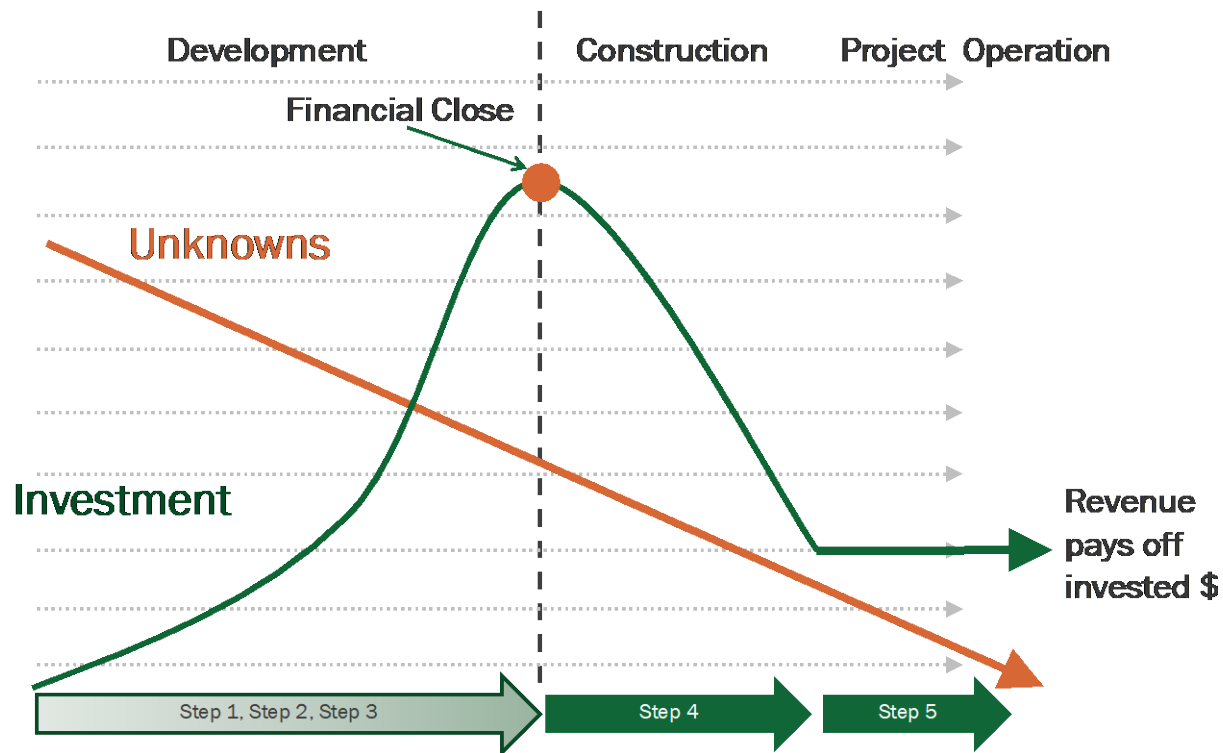
## Project Development and Financing Strategy



# Essential Role of the Project Champion

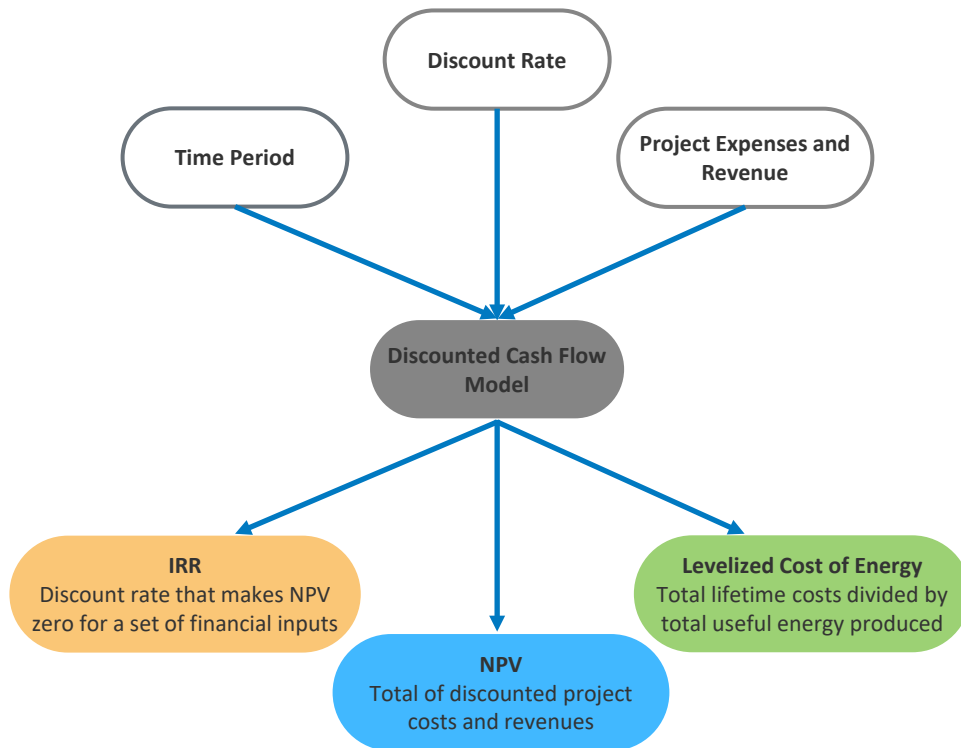


# Incremental Investment Resolves Key Unknowns During Development



# Key Financial Inputs and Metrics for Evaluating Projects

- The **discount rate**, **time period**, and **project cash flows** are inputs for the discounted cash flow model used to calculate **net present value (NPV)**, **internal rate of return (IRR)**, and **levelized cost** metrics.
- The **NPV**, **IRR**, and **levelized cost** are metrics used to evaluate the potential financial value of a project and compare multiple project options.



# Overview of Common Financing Mechanisms

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# EECBG Vouchers

<b>Proportion of Capital</b>	Low - any amount up to total award
<b>Complexity</b>	Low - streamlined application and reporting requirements
<b>Providers</b>	Department of Energy
<b>Potential Instruments</b>	n/a
<b>Key Considerations</b>	<ul style="list-style-type: none"><li>• <b>Two eligible activities:</b> technical assistance or equipment rebates</li><li>• <b>Technical assistance</b> covers a wide range of planning and execution support.</li><li>• <b>Equipment rebates</b> can cover energy-related hardware from e-scooters to hot water heaters.</li></ul>





# Grants

<b>Proportion of Capital</b>	Low
<b>Complexity</b>	Low-medium
<b>Providers</b>	governments, private entities, development banks
<b>Potential Instruments</b>	grants, contingent grants, loan forgiveness
<b>Key Considerations</b>	<ul style="list-style-type: none"><li>• Often require matching funds and/or have restricted uses</li><li>• Good in early stage or limited scope applications (i.e., feasibility study, pilot).</li></ul>



*Photo from Microsoft stock images*

# Equity

<b>Proportion of Capital</b>	Varies
<b>Complexity</b>	Medium-high
<b>Providers</b>	project sponsor, private investors
<b>Potential Instruments</b>	ordinary or preferred shares, tax equity
<b>Key Considerations</b>	<ul style="list-style-type: none"><li>• Private investors may purchase stakes in projects or assets.</li><li>• Sponsor equity often finances early development activities.</li></ul>



*Photo from Microsoft stock images*

# Debt

<b>Proportion of Capital</b>	Medium-high
<b>Complexity</b>	High
<b>Providers</b>	Governments, capital markets, commercial lenders
<b>Potential Instruments</b>	<b>Public:</b> Municipal and green bonds, community development financial institutions, loan programs office, property assessed clean energy <b>Private:</b> Loans, private placement, on-bill financing
<b>Key Considerations</b>	<ul style="list-style-type: none"><li>• Generally available from financial close through project lifetime</li><li>• Often available at multiple points or in different formats for a single project.</li></ul>



Photo from Microsoft stock images

# Third-Party Ownership

<b>Proportion of Capital</b>	n/a
<b>Complexity</b>	variable
<b>Providers</b>	energy service providers
<b>Potential Instruments</b>	energy as a service, equipment leases, privatization
<b>Key Considerations</b>	<ul style="list-style-type: none"><li>• Shifts upfront cost to third-party provider</li><li>• Can also shift operating responsibility to third party</li><li>• Provides long-term predictability to sponsor/host.</li></ul>



# Eligible Activities and Project Examples

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## Strategic and Planning Activities

1. Strategy development
2. Technical consultant services
3. Building energy audits
4. Development and implementation of transportation programs
5. Building codes and inspections.



## Incentives and Structured Finance

1. Financial incentive programs
2. Programs for financing, purchasing, and installing energy efficiency, renewable energy, and zero-emission transportation (and associated infrastructure).



## Infrastructure Investment

1. Energy distribution tech. for energy efficiency
2. Material conservation programs
3. Reduction and capture of methane and greenhouse gases
4. Traffic signals and street lighting
5. Renewable energy technologies on government buildings
6. Energy efficiency and conservation programs for buildings and facilities
7. Energy efficiency retrofits.



# Project Examples



Strategic and Planning  
Activities



Incentives &  
Leveraged Financing

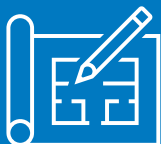


Infrastructure  
Investment

# ExProjects sample: Strategic



Dennis Schroeder/NREL



**Goal:** The recipient wants to reduce operating costs and make progress on their sustainability commitments.

1

## EECBG-Eligible Activity

Energy Audits

## Use of Funds

Pay internal staff or a service provider to identify and prioritize efficiency upgrades for municipal buildings.

## Additional and Complementary Funding

- Federal and state tax credits
- Utility incentives
- Grants



# Example: Alaska Public Buildings Energy Audits

- Alaska Native Tribal Health Consortium conducted energy audits on approximately 80 public facilities over three years.
- Funded by Indian Health Services, Tribal entities, and the American Recovery and Reinvestment Act.
- The consortium increased certified energy auditors and managers on staff.
- 80% of repairs were accomplishable with local labor.



Molly Rettig / NREL 69721

# Example: Strategic Projects



Courtesy of Erik Nielsen / ICF 65894



**Goal:** The recipient wants to reduce operating costs and make progress on their sustainability commitments.

2

**EECBG-Eligible Activity**

Transit Project

**Use of Funds**

Purchase of fleet electric vehicles, supporting infrastructure design, and application for additional funding.

**Additional and Complementary Funding**

- Federal and state tax credits
- Public and private grants
- Debt

# Example: EVs and EV Infrastructure

- Des Moines purchased 4 electric vehicles to pilot in their municipal fleet for \$126k.
- Federal incentives were utilized through a lease-to-own model.
- Thoroughly studied user experience and total cost of ownership with vehicles achieving high ratings and savings in line with projections.
- The City recently approved procurement of an additional 11 vehicles and construction of a new charging facility for 160 vehicles.



Photo by Prateek Joshi / NREL 81245

# Project Examples



Strategic & Planning  
Activities



Incentives and  
Structured Financing



Infrastructure  
Investment

# Example: Incentives and Structured Finance



Courtesy of David Brosch, University Park Community Solar, LLC



**Goal:** The recipient wants to reduce cost barriers to adoption of efficiency and clean energy technologies in their jurisdiction.

1

**EECBG-Eligible Activity**

Revolving Loan Fund  
(internal or external)

**Use of Funds**

Proceeds support the planning and an application for capitalization funding for a revolving loan fund.

**Additional and Complementary Funding**

- Federal and state tax credits or incentives
- Greenhouse gas reduction funds
- Grants

# Example: Minnesota Revolving Loan Fund

- Provides loans up to \$25k for public entities (including schools, counties, municipalities) for renewable energy feasibility studies or investment grade facility audits.
- Funds repaid either from construction financing proceeds or over 3-year term at 2% interest.
- No additional securitization beyond loan agreement.
- Additional examples under EECBG Blueprint 5: [Unlocking Sustainable Financing Solutions for Energy Projects and Programs with Revolving Loan Funds](#)

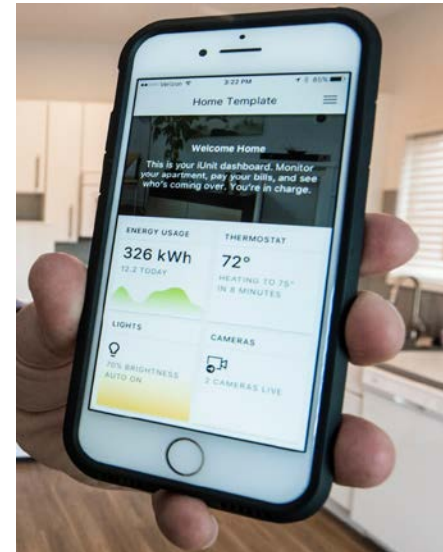


Photo by Dennis Schroeder / NREL 48982

# Examples: Incentives and Structured Finance



Source: Photo from David Brasch, University Park Community Solar, LLC



**Goal:** The recipient wants to reduce cost barriers to adoption of efficiency and clean energy technologies in their jurisdiction.

2

**EECBG-Eligible Activity**

Credit Enhancement

**Use of Funds**

Proceeds fund a loan loss reserve, facilitating more favorable loan terms for clean energy projects.

**Additional and Complementary Funding**

- Utility incentives
- Federal and state tax credits
- Greenhouse gas reduction funds.

# Example: Credit Enhancement

- **Credit enhancements** and **on-bill financing** provided in partnership with private financing providers.
- \$30 of private financing mobilized per dollar of public investment.
- 60% of financing to low- and moderate-income households.
- Seed capital from:
  - Public service commission
  - State appropriations
  - Federal funding
  - Philanthropic loans



**Michigan Saves**®

The Nation's First Nonprofit Green Bank

**450**

million dollars

Financed in energy improvements

**3.1**

million metric tons

Reduced carbon emissions

**9,175**

full-time jobs

Supported through Michigan Saves



*Credit: Michigan Saves*



# Project Examples



Strategic & Planning  
Activities



Incentives &  
Leveraged Financing



Infrastructure  
Investment

# Example: Infrastructure Investment



Source: <https://odppower.com/portfolio-38>



**Goal:** The recipient wants to increase renewable generation and improve resilience in their community.

1

**EECBG-Eligible  
Activity**

Municipal Microgrid

**Use of Funds**

Proceeds provide the municipal equity share of a solar-plus-storage microgrid at a local facility.

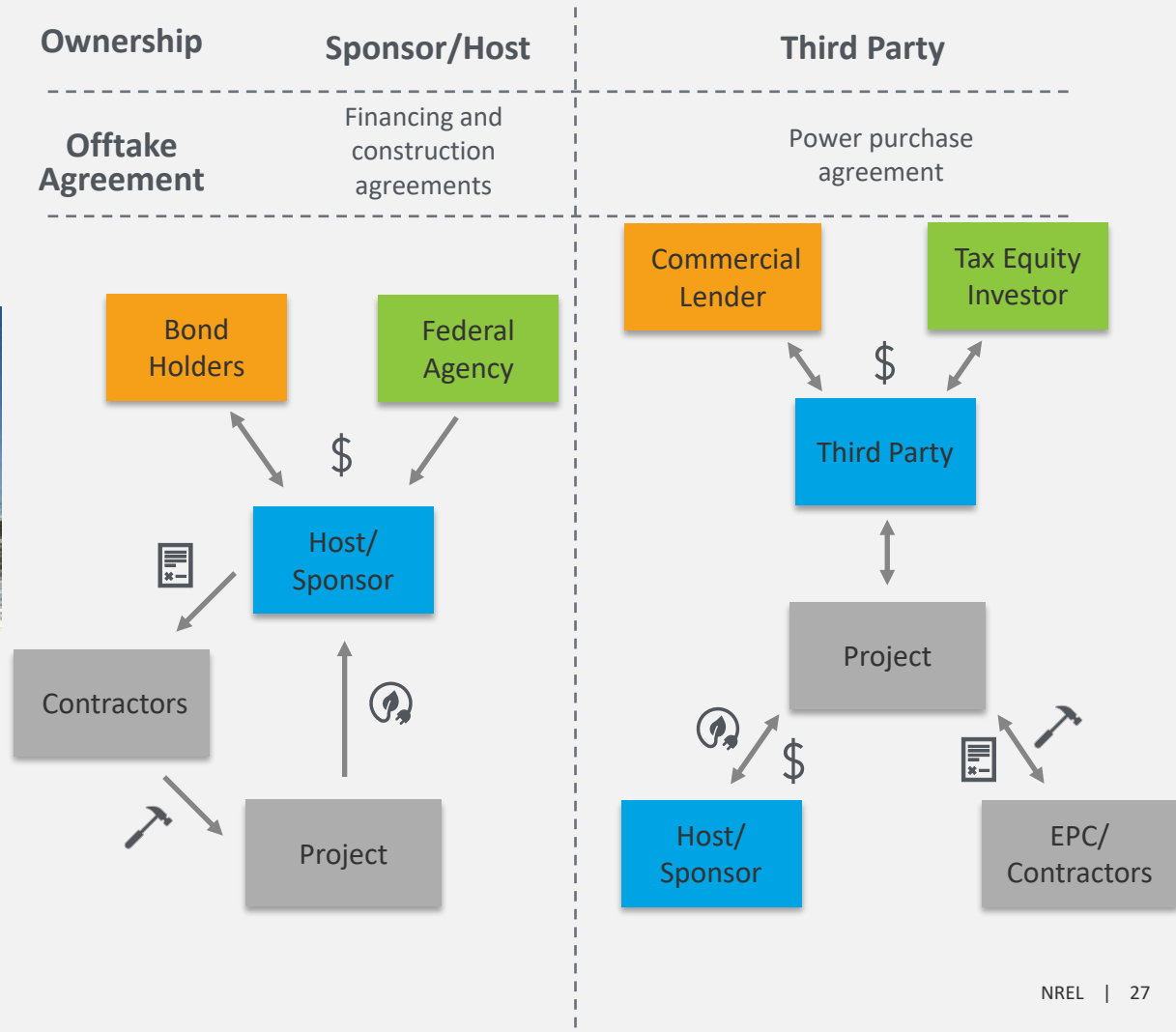
**Additional and  
Complementary  
Funding**

- Federal and state tax credits
- Greenhouse gas reduction funds
- Project finance debt
- Third-party ownership

# Example: Microgrid



NREL/Resilient Energy System



# Example: Microgrid



NREL/Resilient Energy System

Ownership	Sponsor/Host	Third Party
<b>Governing Contract(s)</b>	Financing and construction agreements	Power purchase agreement
<b>Capital Stack</b>	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #f4a460; padding: 10px; text-align: center;">Debt (i.e., green bonds)</div> <div style="background-color: #00a0e3; padding: 10px; text-align: center;">Sponsor equity</div> <div style="background-color: #76c74a; padding: 10px; text-align: center;">Tax credit direct pay</div> </div>	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #f4a460; padding: 10px; text-align: center;">Commercial loan</div> <div style="background-color: #00a0e3; padding: 10px; text-align: center;">Third-party equity</div> <div style="background-color: #76c74a; padding: 10px; text-align: center;">Tax equity investor</div> </div>
<b>Cost of Capital</b>	\$	\$\$\$
<b>Revenue Streams</b>	<ul style="list-style-type: none"> <li>• Tax credits</li> <li>• Operational savings</li> <li>• Resilience benefits.</li> </ul>	<ul style="list-style-type: none"> <li>• Tax credits</li> <li>• Power purchase agreement payments</li> <li>• Grid services</li> <li>• Carbon credits.</li> </ul>

# Infrastructure Example: Recreational Center Microgrid

- Solar + storage microgrid supplies continuous power during grid outages and cleaner electricity and grid services under normal conditions.
- Partners include the city, municipal utility, and a third-party service provider.
- Funding from combination of state and local investments.



<https://microgridnews.com/fort-collins-deploys-aztlan-community-center-resilience-microgrid/>

# Example: Infrastructure Investment



Source: <https://odppower.com/portfolio-38>



**Goal:** The recipient wants to increase renewable generation and improve resilience in their community.

2

## EECBG-Eligible Activity

Energy Efficiency Retrofits

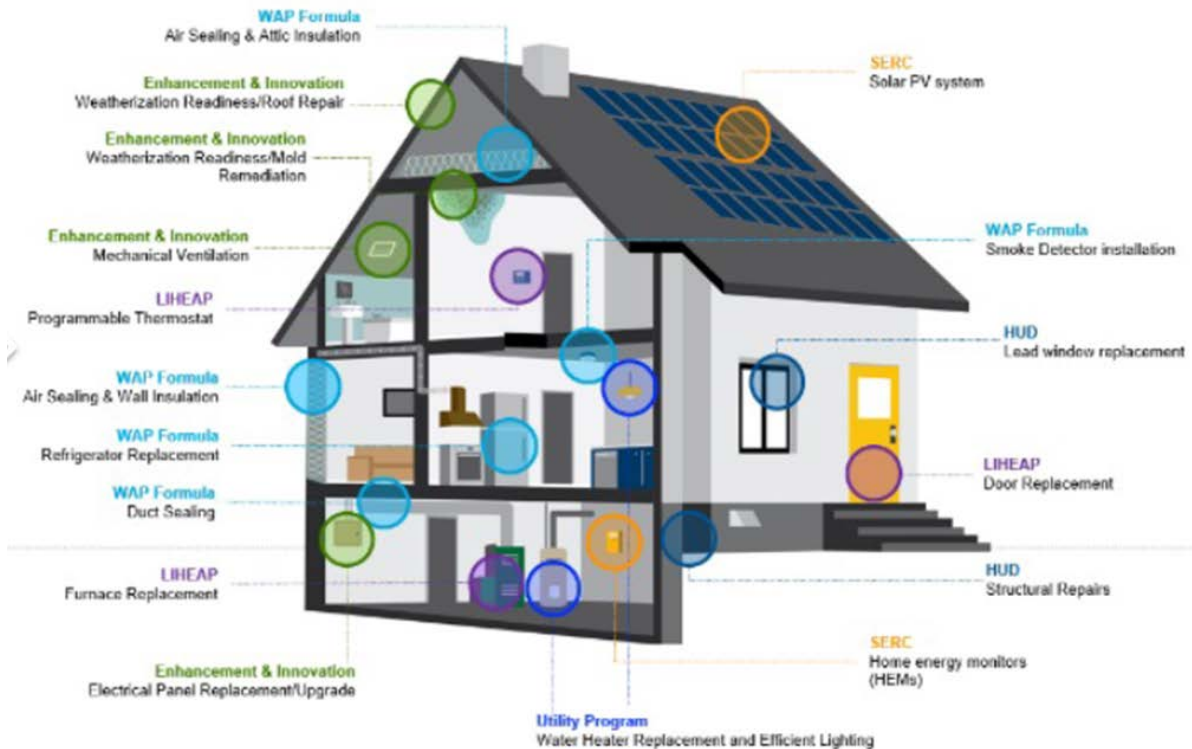
## Use of Funds

Proceeds help purchase updated equipment to install in a government building.

## Additional and Complementary Funding

- Utility incentives
- Federal and state tax credits
- Greenhouse gas reduction funds.
- Third-party: Energy Savings Performance Contract

# Example: Braiding Funding for Energy Efficiency Retrofits



- **Braided Financing:** Utilizing two or more funding sources for a project while separately tracking and reporting on each.
- EECBG funds can supplement or complement existing programs by addressing uncovered areas and/or funding prerequisite activities.

# Ownership Models and Considerations

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# Overview of Ownership Models

## Renewable Energy Ownership Models

Community Shared Renewables

The subscription represents a portion of the generation from the community solar project and often translates to savings on the participant's electric bill.

On-Site Behind-the-Meter

An electricity customer installs and owns a renewable project on the customer side of the meter to supply on-site power and thereby displace power purchased from the utility.

Cooperative Local Ownership

Local participants pool their resources into an LLC to own and operate the project while selling output to the local utility to incorporate into its grid mix to serve all customers.

Flip Structure

Investors without tax liability bring in a tax-motivated corporate equity partner to own most of the project for the period of tax credits (6-10 years) and then "flip" project ownership to the local investor thereafter.

Municipal-Owned

A municipality develops and owns a front-of-the-meter project, potentially financed with tax-exempt municipal bonds, and sells the power to the utility to incorporate into its grid mix to serve all customers.

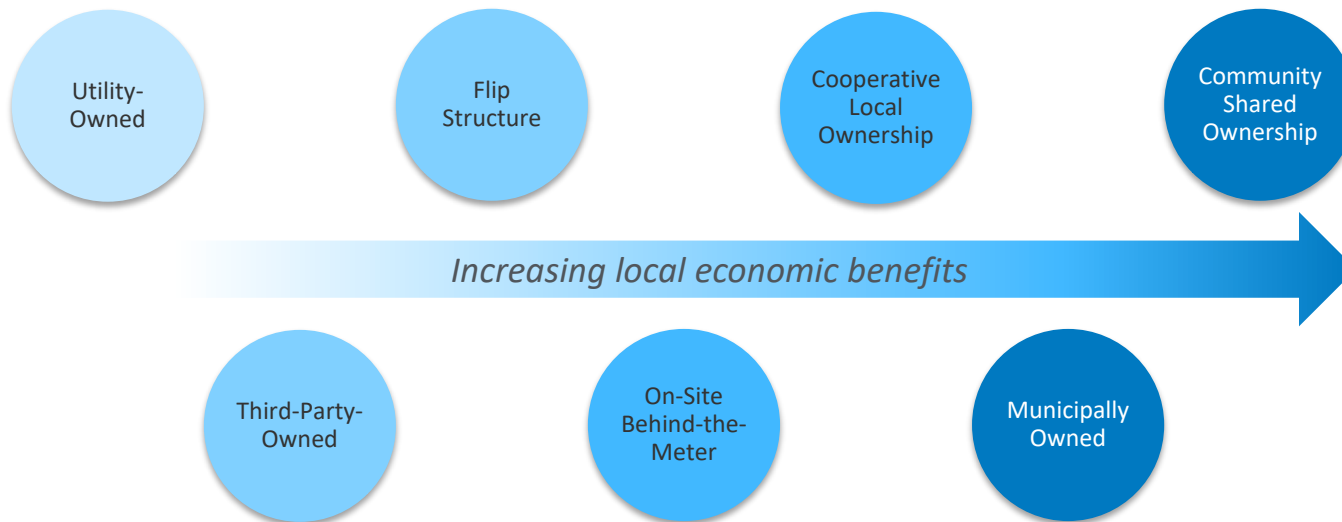
Utility-Owned

A utility provides investment capital to build the project in accordance with utility regulations or board oversight. The utility may be the host or have an agreement with another party that hosts the project on their site.

Third-Party-Owned

A third-party investor provides investment capital and owns all assets under an agreement with the site host. The investor receives a rate of return to cover their upfront investment through financial incentives and subscription payments.

# Community Economic Impacts of Ownership Models



# Thank you; questions?

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**[www.nrel.gov](http://www.nrel.gov)**

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# Additional Resources

- [Investopedia: Financial Terms Dictionary](#)
- [EPA Clean Energy Financing Toolkit](#)
- [National Renewable Energy Laboratory's Manual on Renewable Energy Financing](#)
- [National Renewable Energy Laboratory's Annual Technology Baseline](#)
- [Lazard's Annual Levelized Cost of Energy Report](#)
- [Federal Tax Incentives \(ITC/PTC\) Description](#)
- [U.S. Department of Energy's Better Buildings Financing Navigator](#)
- [U.S. Department of Energy's Office of Indian Energy Online Curriculum](#)
- [Level Ten Energy Development Primer.](#)