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Financing Resiliency

Public Investment in the Northeast

4/23/15

Public investment in resiliency

Public Investment:

- Connecticut DEEP: $45M
- New Jersey BPU: $200M Energy Resilience Bank and $10M Energy Storage
- Massachusetts DOER: $40M Community Clean Energy Resiliency
- New York NYSERDA: $40M NY Prize microgrids, $66 Million CHP

TOTAL: >$400 million in new NE state funds alone in last 24 months

Resilient Solar+Storage Projects to Date:

- New Jersey BPU: $3M for 13 solar+storage projects at schools, WWTP. Total : $12 million; State investment for round two: $6 million
- Massachusetts DOER: $26 million for 21 municipal projects, including 31 solar+storage projects at schools, WWTP. Total project investment: ~$52 million
- Vermont Solar+storage microgrid. Total project investment: $12.5 million

TOTAL: ~$76.5 million in solar+storage projects over the past 6 months*

Different Models

Sources of Funding

- Grants
- Financing
- Credit Enhancement

Uses of Funding

- Design/feasibility
- Grid interconnection
- Generation
- Storage

What is the goal?

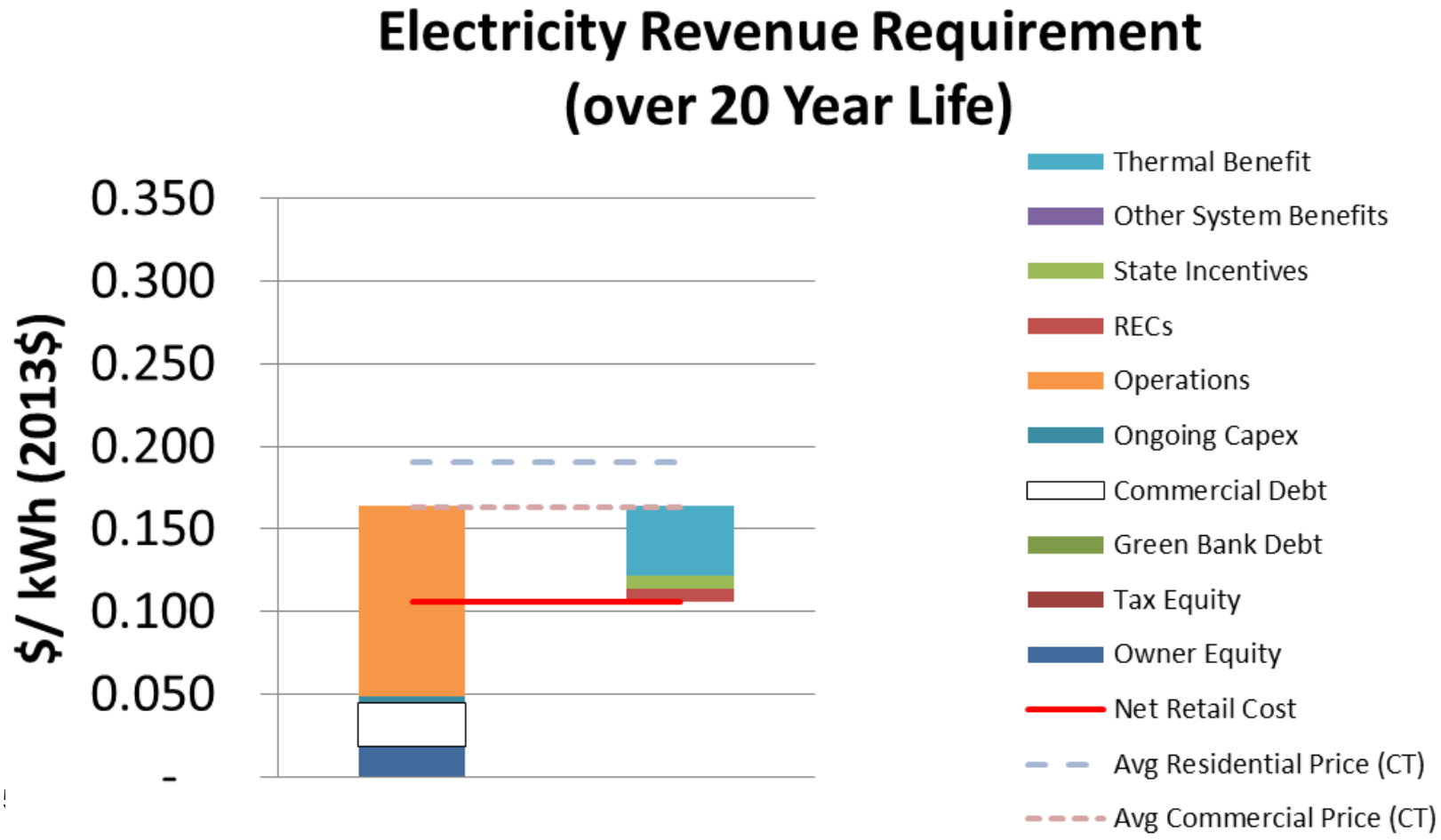
Microgrids confer multiple benefits. **What benefits are we trying to capture? For whom?**

- Reduced energy costs?
- Reduced GHG emissions?
- Increased energy security and reliability?
- Public sector end users? Private sector?

Some benefits may be achieved only at a cost premium. Understanding goals and beneficiaries upfront is important to later identify gaps in the business model and to craft solutions.

Role for Green Bank Capital

The Green Bank seeks projects where revenue less cost over time is sufficiently valuable to attract affordable capital to build the microgrid



Project Finance
Cost & Revenues

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Project Costs

- "Overnight"
  - Equipment & Labor
  - Design & Engineering Fees
  - Grid & end user integration
  - Siting & Permitting
- Ongoing
  - Debt/Capital recovery
  - O&M
  - Fuel
  - Taxes
  - Warranty/Insurance

Project Revenue

End users

- Direct offset to energy purchases

Public sources

- Federal, state & local incentives
- Other grants

Regulatory/Energy Markets

- Renewable energy credits
- Net metering/Virtual net metering
- Demand response
- **Other?**
  - **Capacity payments?**
  - **Reliable power tariff?**
  - **Ancillary grid services?**
  - **Carbon pricing?**

Project Finance
Risk

Financing strategies

How is $$ coming back over time?

- ESA/PPA
- ESPC
- C-PACE
- Tax exempt lease purchase
- Bonds

Managing Risk

How sure are Capital Providers that the $$ will come back over time?

- Performance guarantee
- Equipment warranties
- Other insurance
- Operational history of developers, contractors, and operators
- Creditworthiness of obligor(s)
- PACE lien
- Green bank debt, reserves or other credit enhancements

Financing Challenges for Microgrids

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Multiple Technologies

Existing financial structures focused on individual generator types

Microgrids **link one or more generator technologies**

Multiple Credits

Existing tools for financing projects are structured around customer building types

Microgrids may serve a **network** of all customer types (resi., comm., MUSH, etc)

Multiple Revenue Sources

Benefits include reduced energy costs and GHG emissions and/or energy security and reliability

Energy **savings may not pay for investment** - some benefits come at a **cost premium**

Custom-Fit Solutions

Making microgrids economical is a demand and supply side equation

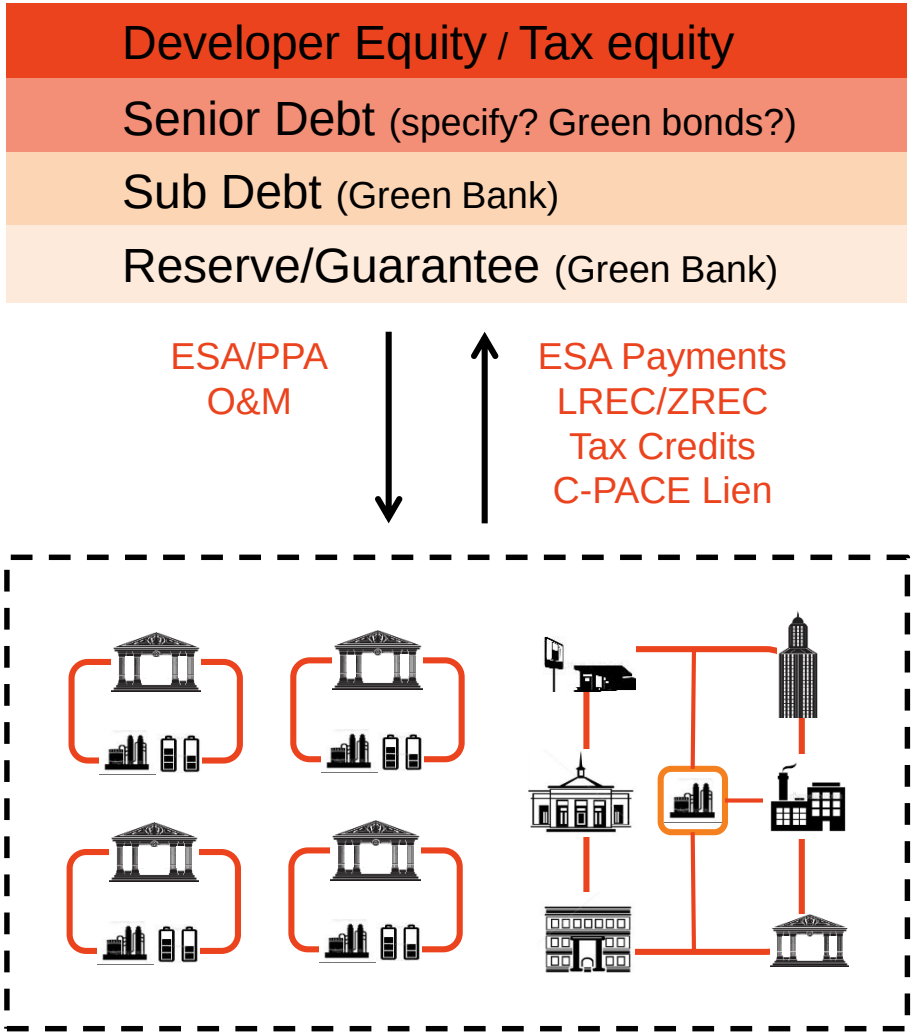
Microgrid customers **in aggregate** must have **a demand profile fitting for the operating profile of the generator(s)**

Addressing the challenges

Scale of projects	• Look for aggregation opportunities
Scope of project and complexity	• Search for replicable models and transaction structures

Warehouse Model

- Multiple microgrid projects, commercial and municipal, are funded under a common financing structure
- Mix of credits allows for greater diversity in project size / facility types. Volume attracts affordable capital.
- Developer equity and ‘flexible’ Green Bank capital mitigate risk for debt providers
- Existing tools like C-PACE leveraged for additional security



Thank you!

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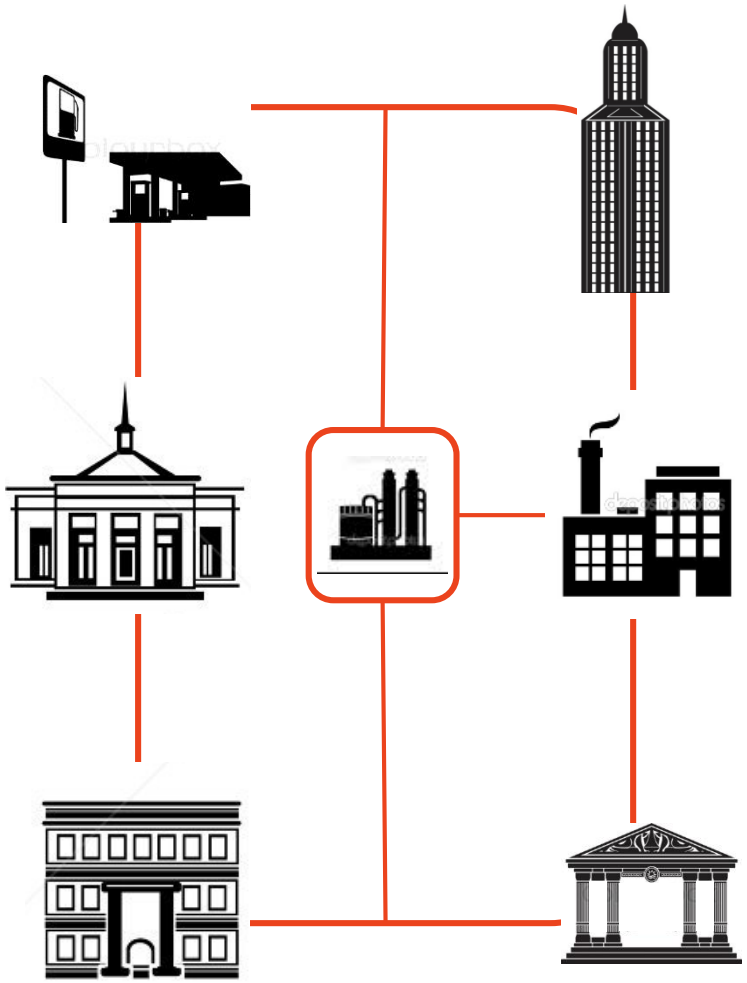
Commercial Microgrid: C-PACE

Private capital provides 100% low-cost, long-term financing securing through senior tax lien and repaid through property bills

Capital costs are assessed to end-users on a pro-rata basis based on their projected ‘benefit’ (e.g. energy savings/R)ECs/et

Microgrid developer locks in repayment of fixed costs over 20 years. Microgrid owner/operator signs short term ESAs with customers for energy supply, delivery, reliability, etc.



Municipal Microgrid: ESPC 'Wrap'

Multiple energy efficiency projects at public facilities are combined with a microgrid project under one Performance Contract

Provides scale necessary for 3rd Party ownership of generating assets.

Public facilities aggregate energy savings from energy efficiency projects and virtual net metering from microgrid.

Aggregate savings underwrite long-term payback on microgrid assets.