Community Solar Stakeholder Advisory Group

Fourth Meeting

November 3rd, 2016

Cook County Community Solar Project

SunShot U.S. Department of Energy

Introduction

- **Project Overview**
- **Today's Goals: Share Resources & Project Updates**
- **Welcome from Host ComEd**
- **Introductions of Attendees**

Deborah Stone
Chief Sustainability Officer & Director
Cook County Department of Environmental Control

U.S. Department of Energy SunShot Initiative

- SunShot Initiative is a national collaborative effort to make solar energy cost-competitive with other forms of electricity by the end of the decade
- Solar Market Pathways Program supports 15 projects that are advancing solar deployment across the United States
- We are working collaboratively with other awardees across the nation and will share lessons learned

Steering Committee

- **Cook County** – Overall Project Oversight and Direction
- **City of Chicago** – Steering Committee Member, Advisory Support
- **Commonwealth Edison** – Implementation Feasibility and Energy Market Expertise
- **Elevate Energy** – Program Management, Stakeholder Engagement, and Local Solar Market Analysis
- **West Monroe Partners** – Technical Expertise and Economic Modeling
- **Environmental Law & Policy Center** – Regulatory Expertise

ENVIRONMENTAL LAW & POLICY CENTER
Protecting the Midwest's Environment and Natural Heritage

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Cook County Community Solar Project

Dec. 2015 to June 2017

- Goal: identify and establish **models** for community solar in Cook County by analyzing pilots.
- Address **barriers** to implementing community solar in Cook County and provide options for resolution.
- Engage a diverse group of **stakeholders** to inform the analysis and deliverables.
- Conduct analysis on the **opportunity, best practices, policies and impact** of community solar.
- http://www.cookcountyil.gov/environmental-control-2/solar-energy/

Host's Welcome:

Val Jensen

Senior Vice President for Customer Operations

ComEd

Val Jensen
Senior Vice President, Customer Operations
ComEd

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Agenda

- Resources
  - Community Solar Cost Tool
  - Community Solar Website
  - Community Solar Toolkit
- Break
- Project Updates
  - Project Timeline & Progress
  - Pilot Development Update
  - Community Solar Valuation Analysis
- Next Steps
- Training Center Tour

Resources

Community Solar Cost Tool

- Developed by the Cook County Community Solar Project team
- With the support of NREL and Solar Market Pathways
- Allows users to specify key input parameters
- Intended to provide directional information about how changes in these variables may impact overall system economics.

Emily McGavisk
Senior Consultant
West Monroe Partners, LLC

Community Solar Cost Tool

- Inputs
  - System Owner IRR: 10%
  - System Size: 1 MW
  - Installation Type: Ground Mount
  - Ownership Entity: Non-Tax Exempt Entity
  - Business Model: Panel Leasing
  - SREC Prices: $99/REC (Mar 2016 Average Bid Price for Systems Over 500 kW)
  - Subscriber Acquisition Difficulty: Medium

Emily McGavisk
Senior Consultant
West Monroe Partners, LLC

Community Solar Suitability Website

- Project made possible through a grant from the Searle Funds at The Chicago Community Trust
- Developed by Elevate Energy
- Our Partners:
  - Cook County Department of Environmental Control
  - Environmental Law & Policy Center
  - Metropolitan Mayors Caucus

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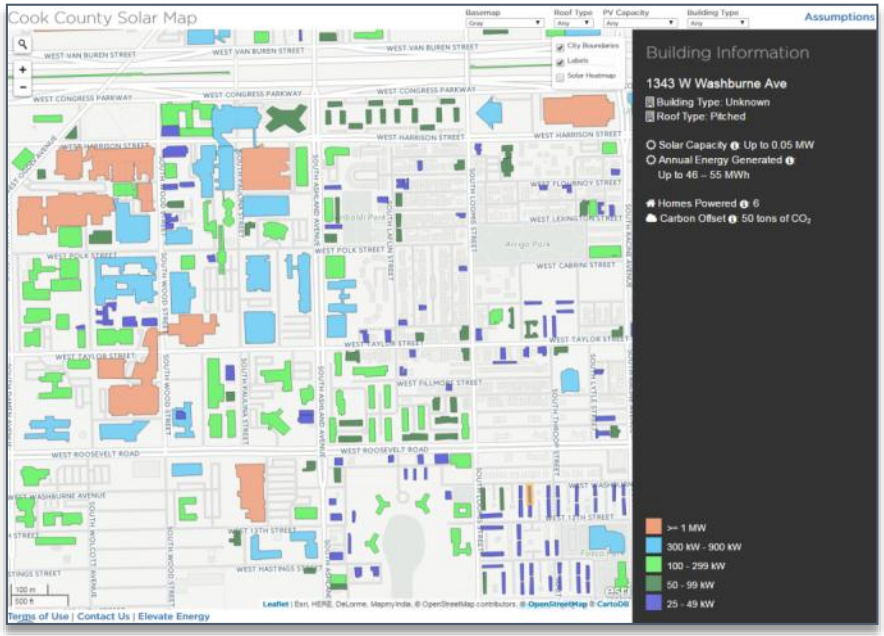
ENVIRONMENTAL LAW & POLICY CENTER

Metropolitan Mayors Caucus

Elena Savona, PMP, CEM, LEED AP
Technical Program Manager
Elevate Energy

Community Solar Suitability Website

- The objective of the solar map is to facilitate community solar development by giving community leaders and developers a tool to identify suitable sites in Cook County.
- Suitable area = rooftop (or land) area minus obstructions, shading, spacing.
- PV capacity displayed: > 25 kW for roof-mounted and >300 kW for ground-mounted installations



www.illinoiscommunitysolar.org

Elena Savona, PMP, CEM, LEED AP
Technical Program Manager
Elevate Energy

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Community Solar Toolkit

- The Institute for Sustainable Communities and the Interstate Renewable Energy Council have developed a Community Solar Toolkit, compiling the best available resources on community solar.
- http://solarmarketpathways.org/toolkit/community-solar/
- Five key topic areas:
  - Fundamentals of Community Solar
  - Policy Tools
  - Program Design & Implementation Tools
  - Finance Tools
  - Consumer & Community Engagement Tools.
- Organized by Type of tool and Audience

Vito Greco
Solar Program Manager
Elevate Energy

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Break

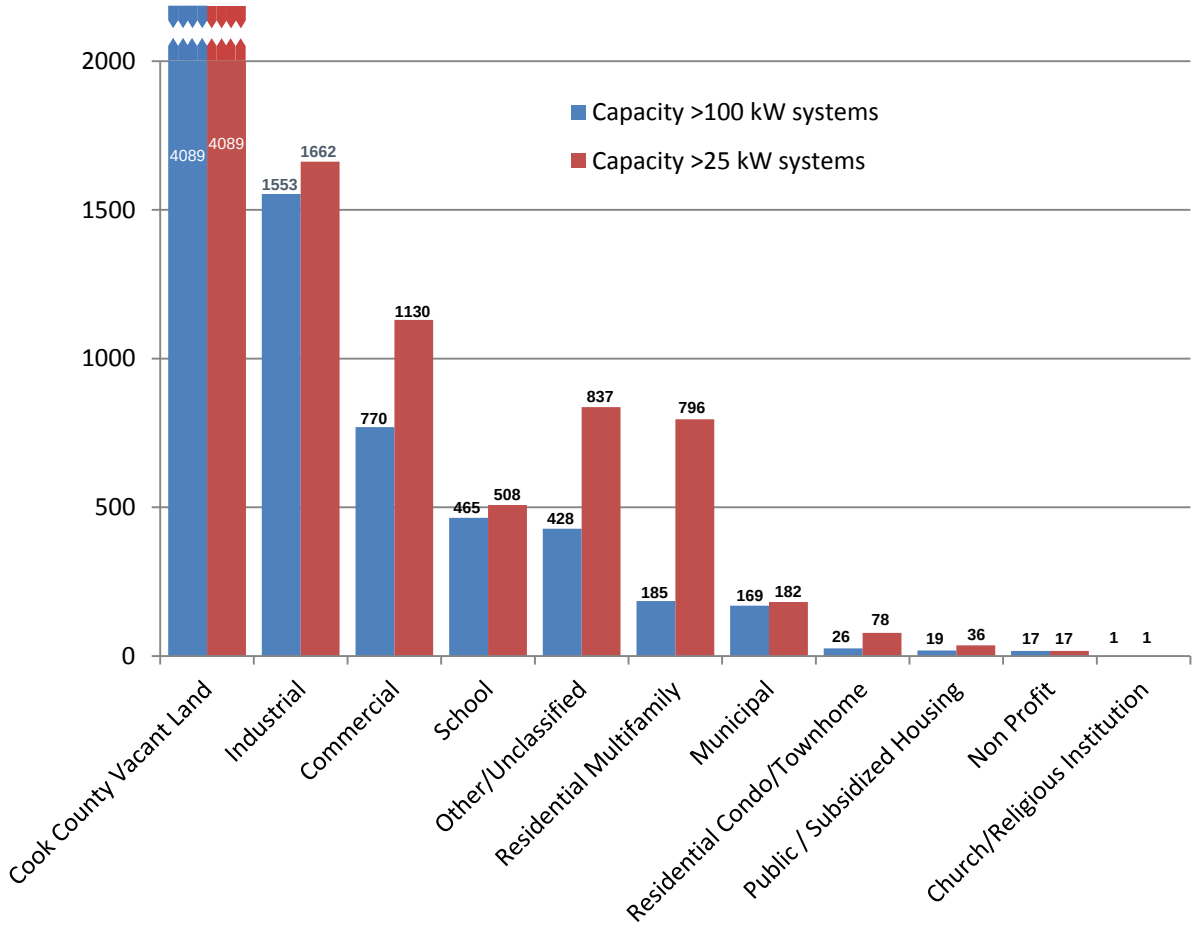
Project Updates

Progress Timeline

	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Task 1: Opportunity Assessment			Opportunity Assessment Analysis					
Task 2: Stakeholder Engagement	Establish Steering Committee	Establish SAG	Conduct Working Group					
Task 3: Policy & Market Barriers	Best Practices Report				Rate Structure-Bill Crediting	Policy Barriers & Market		
Task 4: Pilot Development			RFI-Site Submission Launch		Site Screening		Grid Impact Analysis	
Task 5: Benefits & Impact					Value Proposition Part I		Financial Model/Cost Tool	

Cook County Opportunity Assessment

- Comparison of 100 kW to 25 kW potential sites.



9.3 GW of capacity

7.2 GW of capacity

Excludes Cook County rooftop properties

Key 2016 Deliverables

- Policy & Economic Barriers and Resolutions Work Plan
  - Review of RPS, Net Metering and regulatory framework
  - https://www.cookcountyil.gov/file/1951/download?token=APVMhQmc
- Bill Crediting Analysis
  - Analyzed manual, semi-automated, fully automated and third-party billing options
  - https://www.cookcountyil.gov/file/1953/download?token=d9bgbO5X
- Value Proposition
  - Developed a model to analyze the costs, benefits and value proposition of community solar for Developers and Subscribers
  - https://www.cookcountyil.gov/file/1952/download?token=1n23m_vH

Excludes Cook County rooftop properties

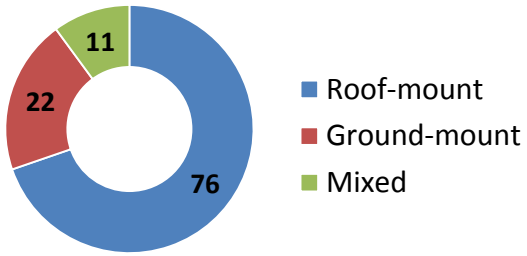
Task 4: Pilot Development

RFI Launch	The public submits sites for consideration to host community solar.	Q4 2015
Suitability Screen	Initial screening for 100 kW + solar capacity, roof life remaining 20+ years.	Q1 2016
Grid Analysis	ComEd analyzes sites for impact to grid; seeking initial screen for proposed capacity.	Q4 2016
Feasibility Studies	Independent engineering study on properties to determine structural feasibility and cost.	Q1 2017
Final Pilots	5 to 7 final demonstration pilot case studies published.	Q2 2017

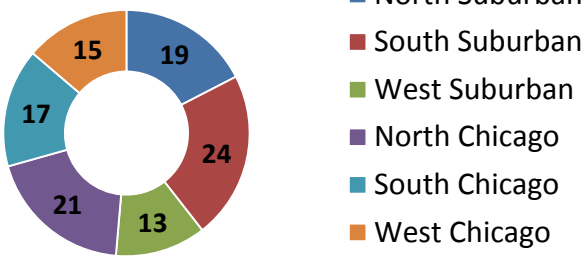
Site Selection: Properties Submitted

- Request for host sites launched in Q4
- 109 sites submitted

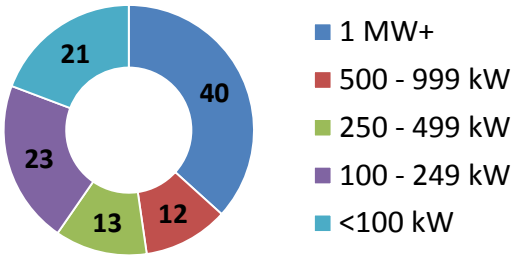
Installation Type by Site
(109 sites)



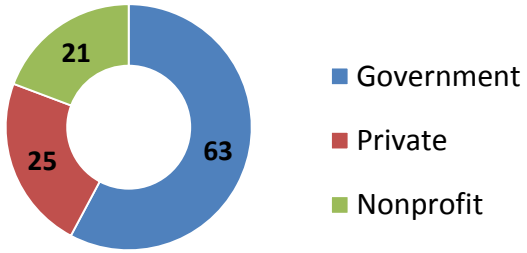
Geography by Site
(109 sites)



Solar Capacity by Site
(109 sites)



Ownership Type-All Submissions
(109 sites)



Pilot Development Update

109 Sites Submitted. Of those…

75 > 100kw, > 10 year roof life

59 > 100kw, > 20 year roof life

44 multiples removed

25

- Selected based on diversity

10-13

- No Interconnection limitations

5-7

- Minimal structural or financial imitations

Vito Greco
Solar Program Manager
Elevate Energy

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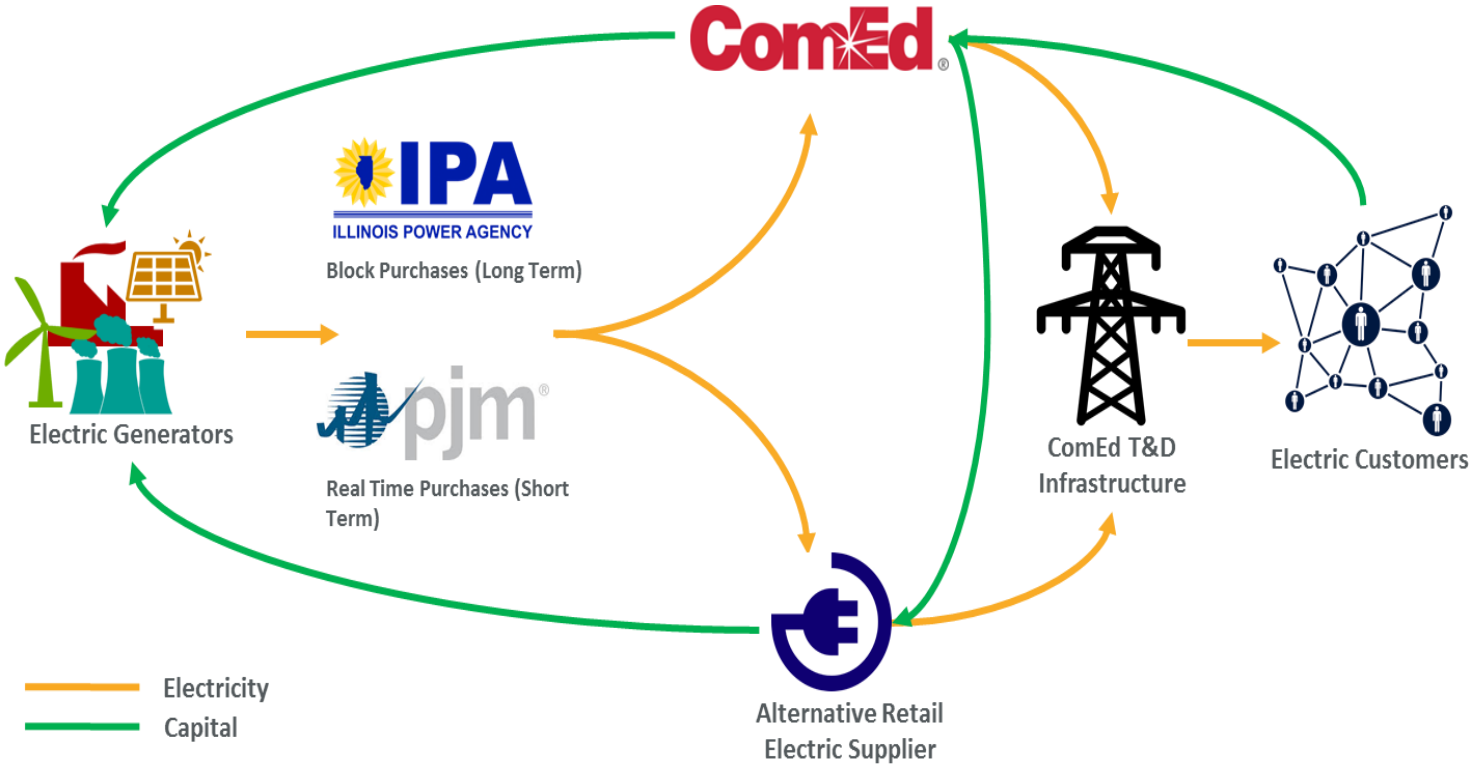
Task 5.1: Value Proposition Analysis Overview

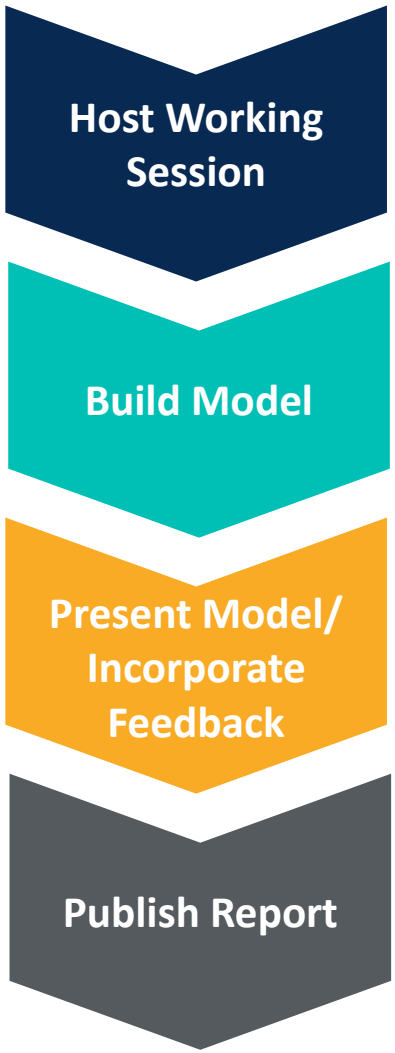
- Draft Value Proposition Analysis was completed in March 2016
  - Modeled costs and benefits of a community solar project to solar subscribers and developers
  - Identified gap in available data for valuation of community solar in deregulated markets
- Additional analysis has been undertaken to allocate costs and benefits to additional stakeholders, including:
  - Wires-only utilities
  - Retail energy suppliers
  - Independent procurement agencies
- The project team has received technical assistance from the National Renewable Energy Laboratory (NREL) to support this Task. The team is currently in the process of designing working sessions to engage a wider group of national subject matter experts to better understand the impacts of community solar to these stakeholder groups

Cook County Market Structure Depiction

Cook County presents a user case that has not been heavily investigated with regard to the value of community solar. Commonwealth Edison, the local transmission and distribution utility, delivers electricity to local residents, but is not responsible for electricity generation (wires-only company). The system owner is generating electricity that is wheeled to PJM



Planned Activities for Creating a Community Solar Valuation Model



Hold working session with local stakeholders with the following objectives:

1. Identify all stakeholders that may be impacted by community solar in a deregulated market
2. Review potential inputs, or categories, of community solar costs and benefits
3. Allocate costs and benefits categories to appropriate stakeholder groups
4. Assign the appropriate cost and benefit values for a Cook County project

Use findings from this session to develop a strawman valuation model

Present proposed valuation approach via a webinar for additional stakeholder feedback and update model based on stakeholder suggestions

Develop Community Solar Value Proposition Report that includes impacts to utilities and alternative retail electric suppliers for public access

Market Players Defined

SOLAR DEVELOPER

Entity that designs and builds the community solar array. This entity often, but not always, owns and operates the assets

SOLAR SUBSCRIBER

A Residential, Commercial or Industrial ratepayer that subscribes to community solar through panel purchase, lease or PPA

T&D UTILITY

An energy delivery provider that manages power lines to deliver electricity to homes and business within its service territory. T&D utilities doe not generate electricity

RETAIL ELECTRIC SUPPLIER

A business that sells electricity to residential and/or commercial customers in a competitive market, including an energy reseller, aggregator, or power marketers

ELECTRIC CUSTOMERS

All rate-paying electric customers

ELECTRIC GENERATOR

An entity that produces electricity for procurement by a utility or ARES

IPA ILLINOIS POWER AGENCY PROCURE-MENT ADMIN.

Develop electricity procurement plans and conduct competitive procurement processes to procure the supply resources identified in the plan(s)

pjm REGIONAL TRANSMISS-ION ORG.

An organization that is responsible for moving electricity over large interstate areas. An RTO coordinates, controls and monitors an electricity transmission grid

SOCIETY

All people living within the community

Community Solar Impact Categories

Previously Evaluated

- Construction Costs
  - PV Modules
  - Inverters
  - Racking
  - BOC
  - Engineering and Design
  - Permitting and Interconnection
  - Installation Labor
  - Equipment rental and freight
  - Development overhead
- Site Costs
- O&M Costs
- Panel Purchase/Lease Payment
- Administrative Costs
- Billing System Costs
- SRECs
- Salvage Value

Under Consideration

- Avoided Energy Generation
- System Losses
- Ancillary Services
  - Reactive supply and voltage control
  - Frequency regulation
  - Energy imbalance
  - Operating reserves
  - Scheduling/ forecasting
- Generation Capacity
- T&D Capacity
- Risk Reduction
- Reliability and Resiliency
- Environmental Compliance
- Environmental/Societal Benefits

Directional Value Matrix

		Solar Developer	Solar Subscriber	T&D Utility	Electric Customer	ARES	Electric Generator	RTO	Society
Generation	Energy								
	System Losses								
	Ancillary Services								
	Generation Capacity – Short Run								
	Generation Capacity – Long Run								
T&D Costs	Transmission Capacity – Short Run								
	Transmission Capacity – Long Run								
	Distribution Capacity – Short Run								
	Distribution Capacity – Long Run								
Risk	Financial risk								
	Resiliency and reliability								
Environmental	Air pollutants								
	Water and land use								
	Environmental compliance								

Next Steps: Community Solar Valuation

◆ Day-long working session with key identified stakeholders	Dec. 2016
◆ Findings compiled and presented via a webinar for additional stakeholder feedback	Jan. 2017
◆ Community Solar Value Proposition Report that includes impacts to utilities and alternative retail electric suppliers will be completed and posted on the Cook County website for public access	March 2017

Next Steps: Local Impacts Analysis

- Overall goal of Task 5 is to document and disseminate the pilot site outcomes of the community shared solar costs and benefits to local, state and regional stakeholders
- Task 5 is comprised of 3 subtasks:
  - **Value Proposition** - quantify the costs and benefits of community solar to impacted parties and identify the factors that influence overall financial metrics
  - **Local Impact Analysis** - create forecasting assumptions to scale the value proposition analysis to derive total local net benefits of increased penetration of community solar on a regional level
  - **Regional Directives** - apply anticipated solar deployment levels against city, county and state renewable energy goals and the expected contributions from this initiative

Next Steps

Progress Timeline

Task 1: Opportunity Assessment

Task 2: Stakeholder Engagement

- Final SAG Meeting

Task 3: Policy & Market Barriers

Task 4: Pilot Development

- Grid Impact Analysis
- Engineering Analysis
- Final Pilot Case Studies

Task 5: Benefits & Impact

- Financial Model/Cost Tool
- Valuation Work Session
- Value Prop. & Impact Analysis

Tour: ComEd Chicago Training Center