SHARED CLEAN ENERGY FACILITIES STUDY

STUDY BRIEFING
March 3, 2015

STUDY COMMITTEE

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STUDY COMMITTEE MEETINGS: *Guest Speakers*

- **Study Committee Members - Karl Rabago and Jordan Gerow:** ***Key Points to Consider and Guidance***
- **Massachusetts Department of Energy Resources:** ***Current Community Shared Solar Program; Rooftop Solar Challenge; Design of MA's Community Shared Solar Program in SREC-II***
- **US Department of Energy:** ***Community Shared Solar - Federal Initiatives, Best Practices, and Issues to Consider***
- **John Farrell, Institute for Local Self-Reliance:** ***Community Solar Power - Obstacles and Opportunities***
- **National Renewable Energy Laboratory:** ***Summary - A Guide to Community Shared Solar***
- **ISO New England:** ***Update on Solar Photovoltaic (PV) Integration and Grid Impacts***
- **Richard Perez, Research Professor, Atmospheric Sciences Research Center, University of Albany:** ***Community Shared Solar - Current Research: Renumerating PC and Face Value***
- **Erica Schroeder McConnell, Keyes, Fox & Wiedman LLP on behalf of the Interstate Renewable Energy Council:** ***Best Practices for Community Shared Solar***
- **Eversource Energy:** ***Perspectives on Distributed Energy Resources in Connecticut***
- **United Illuminating:** ***UIL Holdings Perspectives on Shared Clean Energy Facilities***
- **Rocky Mountain Institute:** ***Bridges to New Solar Business Models - Opportunities to Increase and Capture the Value of Distributed Solar Photovoltaics***
- **Clean Energy Collective:** ***Implementation of A Shared Clean Energy Facilities Program***
- **Hawaii State Energy Office, Department of Business, Economic Development and Tourism:** ***Supporting Hawaii's Clean Energy Transformation***

WHAT IS A SHARED CLEAN ENERGY FACILITY (SCEF)

- **A SCEF is a Class I renewable energy resource, such as solar, that provides power and/or financial benefit to multiple subscribers**

- **Typically, subscribers and the SCEF are located within the same Electric Distribution Company service territory**

- **SCEF ownership and management models include special purpose entities (business model), utility-sponsored, and nonprofit entities**

- **SCEF subscribers purchase subscriptions that represent an ownership or lease interest in the facility**

A six-acre solar farm occupies a former brownfield adjacent to the Cuyahoga Metropolitan Housing Authority headquarters on Kinsman Road in Cleveland

BRIEF STATEMENT OF PRIMARY CONCLUSION

- **Key goals of Connecticut's energy policy include increasing the amount of electricity generated from clean energy resources and diversifying the state's energy supply mix**

- **Based on the success of the state's residential solar PV program and Connecticut's relatively high electricity rates, it is expected that a SCEF Program will be of interest to ratepayers seeking to reduce their electricity expense, while helping to achieve the state's goals**

BRIEF STATEMENT OF PRIMARY CONCLUSION (2)

- **Implementation of a Connecticut SCEF Program requires adoption of legislation and program rules**
- **The program should allow for multiple business models to maximize opportunities for facility development, competition, and choice for all interested participants**
- **Furthermore, a value of clean energy analysis should be conducted to assure rate fairness for all business interests and classes of ratepayers including low-income populations**

BRIEF STATEMENT OF PRIMARY CONCLUSION (3)

- **Transforming the energy landscape for the 21st century requires that several broader issues be addressed to achieve a cleaner, safer, and more reliable system related to the anticipated increase in distributed generation, including:**
  - ✓ **fairness in overall rate design to achieve the greatest value from clean distributed energy resource generation — with a goal of reducing the overall cost of electricity**
  - ✓ **development of utility business models to adapt to the evolving operating environment**
  - ✓ **technology challenges to assure that the intended benefits of distributed generation are achieved**

SECTIONS OF THE STUDY REPORT

- Executive Summary
- Introduction
- Overview and Related Benefits
- The Regulatory Framework
- Project Models
- Case Studies
- Focus Group Sessions: Summary
- Components of the Value of Clean Energy Analysis and SCEF Financial Costs
- Findings and Recommendations

STAKEHOLDERS

- Connecticut Green Bank
- Connecticut Siting Council
- Department of Consumer Protection
- Department of Energy and Environmental Protection
- Electric Distribution Companies
- Industry Representatives
- ISO New England
- Office of Consumer Counsel
- Public Utilities Regulatory Authority
- Subscribers
- Subscriber Organizations
- Third Party Owners/Builders/Operators

FINDINGS: *The Vision*

INCREASE AMOUNT OF CLEAN ENERGY GENERATED IN CT

- ✓ **2013 Comprehensive Energy Strategy for Connecticut**
- ✓ **Renewable Portfolio Standard (RPS) goals**
- ✓ **CT General Statutes — Title 22a: Environmental Protection; Chapter 446c: Air Pollution Control; Section 22a-200a: Reduction of Greenhouse Gas Emissions, Mandated Levels**
- ✓ **2015 Department of Energy and Environmental Protection (DEEP) Draft Integrated Resource Plan (IRP) *(Note: IRP provides notice that the 2020 Class 1 RPS goal may not be achieved)***
- ✓ **CT General Statutes — Title 16a: Planning and Energy Policy; Chapter 298: Energy Utilization and Conservation; Section 16a-35k: Legislative Findings and Policy**

CONNECTICUT GENERAL STATUTES
TITLE 16a: PLANNING AND ENERGY POLICY
CHAPTER 298: ENERGY UTILIZATION AND CONSERVATION
SECTION 16a-35k: LEGISLATIVE FINDINGS AND POLICY

The general assembly finds that the state of Connecticut is severely disadvantaged by its lack of primary energy resources; that primarily as a result of past policies and tendencies, the state has become dependent upon petroleum as an energy source; that national energy policies do not preclude the recurrence of serious problems arising from this dependence during petroleum shortages; that the increase in oil prices since the 1973 oil embargo has had a major impact on the state; that the economy has suffered directly because of our dependence on petroleum and constraints upon the rate of conversion to alternatives; **that other conventional sources of energy are subject to constraints involving supply, transportation, cost and environmental, health and safety considerations;** and that the state must address these problems by conserving energy, increasing the efficiency of energy utilization and developing renewable energy sources. **The general assembly further finds that energy use has a profound impact on the society, economy and environment of the state, particularly in its impact on low and moderate-income households and inter-relationship with population growth, high density urbanization, industrial well-being, resource utilization, technological development and social advancement, and that energy is critically important to the overall welfare and development of our society. Therefore, the general assembly declares that it is the policy of the state of Connecticut to** (1) conserve energy resources by avoiding unnecessary and wasteful consumption; (2) consume energy resources in the most efficient manner feasible; **(3) develop and utilize renewable energy resources, such as solar and wind energy, to the maximum practicable extent; (4) diversify the state's energy supply mix; (5) where practicable, replace energy resources vulnerable to interruption due to circumstances beyond the state's control with those less vulnerable; (6) assist citizens and businesses in implementing measures to reduce energy consumption and costs; (7) ensure that low-income households can meet essential energy needs; (8) maintain planning and preparedness capabilities necessary to deal effectively with future energy supply interruptions and** (9) when available energy alternatives are equivalent, give preference for capacity additions first to conservation and load management. **The state shall seek all possible ways to implement this policy** through public education and cooperative efforts involving the federal government, regional organizations, municipal governments, other public and private organizations and concerned individuals, **using all practical means and measures, including financial and technical assistance, in a manner calculated to promote the general welfare by creating and maintaining conditions under which energy can be utilized effectively and efficiently.** The general assembly further declares that it is the continuing responsibility of the state to use all means consistent with other essential considerations of state policy to improve and coordinate the plans, functions, programs and resources of the state to attain the objectives stated herein without harm to the environment, risk to health or safety or other undesirable or unintended consequences, to preserve wherever possible a society which supports a diversity and variety of individual choice, to achieve a balance between population and resource use which will permit the maintenance of adequate living standards and a sharing of life's amenities among all citizens, and **to enhance the utilization of renewable resources so that the availability of nonrenewable resources can be extended to future generations. The general assembly declares that the energy policy is essential to the preservation and enhancement of the health, safety and general welfare of the people of the state and that its implementation therefore constitutes a significant and valid public purpose for all state actions.**

(P.A. 78-262, S. 1, 2; P.A. 79-449, S. 1, 7; P.A. 82-222, S. 1, 7; P.A. 92-106, S. 1.)

History: P.A. 79-449 amended section to point out constraints on conversion to alternative forms of energy, including conventional sources of energy and to include consideration of development of renewable forms of energy; P.A. 82-222 applied energy policy to diversification, energy costs and supply interruptions and to all state actions; P.A. 92-106 added a new Subdivision (9) providing preference to conservation over other equivalent energy alternatives.

FINDINGS: *Achieving Energy Goals & Benefits*

- **SCEFs — along with other state programs and incentives — will help meet state policy, strategy, RPS, and IRP goals and increase in-state clean energy generation**

Additional benefits include:

- ✓ **Increasing access to clean energy for more residents and businesses**
- ✓ **Tangible economic benefits to SCEF owners and subscribers**
- ✓ **Providing grid design and improvements that move toward decentralization to foster resiliency and security, offer locational benefits, defer future upgrades and high marginal costs, and avoid system losses**
- ✓ **Help to achieve RPS targets at competitive prices**
- ✓ **Improving environmental quality and helping to attain greenhouse gas goals**

FINDINGS: *Focus on Solar PV*

All Class I Clean Energy Technologies Eligible

- **Connecticut's Class I renewable energy resources include (*):**
  - ✓ **Solar power**
  - ✓ **Wind power**
  - ✓ **Fuel cell**
  - ✓ **Geothermal**
  - ✓ **Landfill methane gas**
  - ✓ **Anaerobic digestion or other biogas derived from biological sources**
  - ✓ **Thermal electric direct energy conversion from a certified Class I renewable energy source**
  - ✓ **Ocean thermal power**
  - ✓ **Wave or tidal power**
  - ✓ **Low emission advanced renewable energy conversion technologies**
  - ✓ **Run-of-the-river hydropower**
  - ✓ **Sustainable biomass facility**
- **Solar PV systems have principally been used in other regions and are expected to be the most likely energy resource used for SCEFs in Connecticut**

(*) Connecticut General Statute §16-1(a) sections (26), (27), and (44)

FINDINGS: *Need for Legislation and Program Rules*

- **Developers would generally be reluctant to develop projects in the state as practical matter without legislation that provides a framework and program rules that set forth the details of the SCEF program**
- **Legislation is specifically needed to authorize the SCEF utility-sponsored model — most widespread type of SCEF in the United States**
- **Current state statutes should be reviewed to determine if any changes are needed to avoid conflicts between existing laws and proposed SCEF legislation**

RECOMMENDATIONS: *Overview*

- **Adopt legislation to provide a framework for a SCEF program**
- **Mandate for DEEP to engage in the rulemaking needed to develop detailed Program Rules and to conduct a *value of clean energy* analysis proceeding**
- **Examination of related issues and legislative considerations**

RECOMMENDATIONS: *Adopt Legislation*

- **Consistent with current interconnection & siting requirements**
- **Based on relevant aspects of the state's successful residential solar PV program and the Interstate Renewable Energy Council's (IREC) Model Rules; and**
- **Direct DEEP to:**
  - ✓ **Develop SCEF Program Rules – detailed provisions for operations and administration**
  - ✓ **Adopt the SCEF Program Rules and initiate the SCEF Program within six months from enactment of SCEF legislation**
  - ✓ **Review the Program Rules at least once every three years, and report on program results to the General Assembly periodically**
  - ✓ **Develop the methodology for and conduct a proceeding to determine the *value of clean energy* by type of resource used in the state for the purpose of establishing SCEF billing credit rates**

RECOMMENDATIONS: *Adopt Legislation – A Framework*

- **Permit the development and operation of SCEFs that utilize any Class I renewable energy resource**
- **Provide flexibility to accommodate the various business models to own and operate SCEFs**
  - **For-profit organizations and others (Special Purpose)**
  - **Not-for-profit organizations (Nonprofit)**
  - **Electric distribution companies (Utility-Sponsored)**

RECOMMENDATIONS: *Adopt Legislation – A Framework*

- **A definition of key terms**
- **The SCEF must have at least two Subscribers**
- **Subscribers of an SCEF and the SCEF must be physically located within the same electric distribution company service territory**
- **Subscriptions sold from a single SCEF cannot exceed 100% of the SCEF's nameplate capacity**
- **SCEFs must comply with existing standards and requirements for siting and interconnection of distributed renewable energy electricity generating facilities based on their nameplate capacity — *Legislation should not provide a SCEF capacity size limit***
- **The SCEF Organization shall own the renewable energy credits (RECs) for electricity generated from the facility unless or until transferred by contract to others**
- **The EDC shall be required to enter into a power purchase agreement with any SCEF located in its service territory consistent with the SCEF Program Rules — *including that the term of such agreement shall be for the life of the SCEF***

RECOMMENDATIONS: *Adopt Legislation – A Framework*

BILLING CREDIT RATE

- **SCEF billing credit rate shall be determined by the *value of clean energy* analysis and ratemaking process**
- **SCEF Subscribers shall receive a billing credit on their monthly electricity bill for their share of energy generated from the SCEF as reported by the SCEF Organization to the EDC**
- **A Subscriber's excess billing credit, if any, shall be carried over month to month to the end of the annual *'solar'* billing cycle and paid out as a cash credit on the next monthly bill *(cash credit rate to be determined by the value of clean energy analysis and rate making process)***

RECOMMENDATIONS: *Adopt Legislation – A Framework*

INTERIM BILLING CREDIT RATE: *If SCEF Program is initiated prior to adoption of SCEF billing credit rates*

- **For SCEFs established prior to adoption of SCEF Program billing credit rates based on the result of the *value of clean energy* analysis:**
  - ✓ **The state's existing net metering program for its residential solar PV program shall be used as the interim billing credit rate**
  - ✓ **The interim billing credit rate shall apply to a SCEF upon its execution of a power purchase agreement with an EDC and successful SCEF registration with the state as specified in the SCEF Program Rules**
  - ✓ **Additionally, Subscribers of SCEFs established in advance of adoption of the SCEF Program billing credit rates shall be grandfathered to receive whichever rate is higher — the interim billing credit rate or the SCEF Program billing credit rates — for the life of the SCEF**

RECOMMENDATIONS: *Adopt Legislation – A Framework*

- **SCEF Unsubscribed Electricity Generation**
  - ✓ **For a two-year period following the effective date of SCEF registration with the state as specified in the SCEF Program Rules, the Subscriber Organization will receive the rate that is, or would be, paid to Subscribers for unsubscribed electricity generation**
  - ✓ **After this initial two-year period, the Subscriber Organization will receive the rate for unsubscribed generation as determined through the *value of clean energy* analysis and ratemaking process; however, until such time as the rates are set by this process a SCEF will receive the avoided cost rate of wholesale power**
- **DEEP shall incorporate low-income household participation into the SCEF program along with possible incentives for utilities that aid in meeting this goal**

RECOMMENDATIONS: *Adopt Legislation – A Framework*

VALUE OF CLEAN ENERGY ANALYSIS

- **The 2014 Draft IRP states that DEEP's plan is to conduct "a proceeding to evaluate the *value of distributed generation*"**
- **Direct DEEP to conduct the value of clean energy analysis and that such analysis shall be completed within one year of enactment of the legislation**
- **A value of clean energy analysis should be conducted for each type of Class I clean energy renewable resource — start with solar PV, likely to be the most widespread type of SCEF developed, at least initially**
- **Proceeding should be a transparent process, involving all stakeholders**
- **Mandate PURA to use the result of the DEEP analysis to conduct a ratemaking process to establish billing credit rates by type of resource for SCEFs, as well as other clean distributed energy resource generators**
- **The value of clean energy SCEF billing credit rates shall apply to all projects initiated after the ratemaking process has been completed**
- **For SCEF projects established prior to that date, whichever rate is higher — the interim billing credit rate or the value of clean energy billing credit rate — shall apply**

RECOMMENDATIONS: *Program Rules*

MANDATE DEEP TO ADOPT PROGRAM RULES

- **Requirements for SCEF Organization registration, including filing with PURA:**
  - ✓ **SCEF Organization's prototype Subscriber Agreement**
  - ✓ **SCEF/EDC power purchase agreement**
- **Requirement for electric distribution company to enter into power purchase agreement with SCEF**
- **Applicable facility siting and interconnection requirements**
- **Safety, performance and interconnection standards**
- **Control, testing and inspection requirements**
- **The maximum size of a SCEF Subscriber's subscription shall not exceed 120% of the Subscriber's average monthly electricity consumption for the most recent 12 months**
  - ✓ **Subscribers should have the option to increase or decrease subscription shares no more frequently than quarterly, based on availability and terms and conditions of transferability and portability provisions of the SCEF Program and the Subscriber Agreement**

RECOMMENDATIONS: *Program Rules (cont.)*

- **Subscription transferability that enables a Subscriber to transfer interest in a SCEF to another entity eligible to be a Subscriber for any reason**
- **Subscription portability that enables a Subscriber to retain a Subscription upon relocation within the same EDC service territory**
- **Timely reporting of Subscriber information by the SCEF Organization to the electric distribution company**
- **Billing credit rates for SCEFs shall be established based on the results of the value of clean energy analysis for each type of clean renewable energy resource**
  - ✓ **Until such time as the SCEF billing credit rates are adopted, the applicable billing credit rate for SCEFs and Subscribers shall be the interim billing credit rate as set forth in the SCEF legislation**
- **REC ownership provisions as set forth in legislation**

RECOMMENDATIONS: *Program Rules (cont.)*

- **Consumer protections and disclosures should be developed by DEEP in consultation with the Office of the Consumer Counsel and the Department of Consumer Protection (*)**
  - ✓ **SCEFs should be required to provide potential subscribers with this information prior to purchase of a Subscription, as well as including it in the Subscriber Agreement**
- **A recent energy home or business efficiency audit should be required for a Subscriber to be eligible to participate in the SCEF program**
  - ✓ **For homeowners, this requirement is the same as for the Connecticut Green Bank's residential solar PV program.**
  - ✓ **For renters, a modified program should be created**
- **Develop a low-income household component of the SCEF program**
- **Reporting requirements to the General Assembly on program outcomes**

(*) ***The IREC Model Rules and best practices (i.e., 16 CFR Part 260: Environmental Marketing Guidelines, "Green Guides") should be used as guidance***

RECOMMENDATIONS: *Program Rules (cont.)*

- **DEEP should create a website that includes all SCEF Program information to assure that interested stakeholders and potential Subscribers have accurate and timely information about the program**

- **DEEP should develop financing and incentive options in collaboration with the Connecticut Green Bank to encourage SCEF development and participation — including low-income household participation — as a way to meet the state's renewable energy resource generation goals**

- **The Connecticut Green Bank's current programs should be considered for expansion or modification to include eligibility for SCEF owners and Subscribers**

RECOMMENDATIONS: *Other Issues for Consideration*

- **The following issues related to SCEFs and increasing penetration and use of distributed generation should be considered:**
  - ✓ **General rate design, including ratepayer fairness considerations and reducing peak demand**
  - ✓ **Locating distributed energy resources to create the most system value, such as reducing system congestion and improving grid stability, reliability, resiliency, safety, and security**
  - ✓ **Development of innovative electric distribution company business models with performance incentives for supporting deployment and use of distributed generation**
  - ✓ **Ongoing monitoring of other states' experiences and cooperating with initiatives of regional entities such as the ISO-NE Distributed Energy Resource Working Group**
  - ✓ **Identify and plan to implement technical solutions, including advanced inverters and energy storage, if necessary, to assure grid stability and reliability with regard to transient loads and other technical issues, especially in areas with high levels of penetration and use of intermittent clean energy resources and other distributed energy resources**

RECOMMENDATIONS: *Other Legislative Considerations*

RELATED LEGISLATIVE INITIATIVES FOR CONSIDERATION

- **Allow EDCs to develop additional clean renewable energy resource generation facilities for specific permitted purposes including, but not limited to, enhancing the distribution system to:**
  - ✓ **reduce congestion**
  - ✓ **increase reliability, resiliency, safety and security**
- **Direct the Siting Council to review MW capacity siting requirement for various types of clean energy resources based on facility characteristics and to conduct an evaluation to revise requirements based on the results**
- **Commission a study to evaluate the benefits and costs of using complementary technologies including, but not limited to, storage and advanced inverters for enhancing the value of intermittent Class I clean energy resources on the grid**

RECOMMENDATIONS: *Other Legislative Considerations*

RELATED LEGISLATIVE INITIATIVES FOR CONSIDERATION

- **Revise the Clean Energy Options Program to provide that funds collected are used to construct clean energy resource generation facilities in Connecticut**
  - ✓ **Projects would be proposed and owned by EDCs and others for the benefit of ratepayers**
  - ✓ **DEEP would manage the proposal process for selection of projects for PURA's consideration**
  - ✓ **Projects should be for the purpose of enhancing the reliability or performance of the distribution system, thereby providing the most value to the system and ratepayers**
  - ✓ **Ratepayers who currently participate in the program would be given options to stay with their current selection or shift to new program**
- **The voluntary financial support of ratepayers will be used to help Connecticut achieve its clean energy goals for the benefit of all Connecticut ratepayers**

THANK YOU

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