

SHARED CLEAN ENERGY FACILITIES

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This study was initiated at the request of the Connecticut General Assembly on September 18, 2014. The project was conducted by an Academy Study Committee with the support of staff of the Connecticut Economic Resource Center, Inc., serving as the study management team with assistance from study advisors Joel Gordes and David Pines, PhD. The content of this report lies within the province of the Academy's Energy Production, Use and Conservation Technical Board. The report has been reviewed by Academy Members A. George Foyt, ScD and Med Colket, PhD. Martha Sherman, the Academy's Managing Editor, edited the report. The report is hereby released with the approval of the Academy Council.

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LIST OF ACRONYMS

CGA	Connecticut General Assembly
DEEP	Connecticut Department of Energy and Environmental Protection
DRIPE	Demand Reduction Induced Price Effect
EDC	Electric Distribution Company
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
IREC	Interstate Renewable Energy Council
ISO-NE	Independent System Operator - New England
ITC	Investment Tax Credit
kW	Kilowatt
kWh	Kilowatt Hour
LREC	Low-Emission Renewable Energy Credit
MW	Megawatt
MWh	Megawatt Hour
NREL	National Renewable Energy Laboratory
PURA	Public Utility Regulatory Authority
PV	Photovoltaic
REC	Renewable Energy Credit
RMI	Rocky Mountain Institute
RPS	Renewable Portfolio Standard
SCEF	Shared Clean Energy Facility
ZREC	Zero Emission Renewable Energy Credit

EXECUTIVE SUMMARY

At the request of the Connecticut General Assembly's (CGA) Energy and Technology Committee, the Connecticut Academy of Science and Engineering (CASE) conducted this study of the issues related to the development and use of Shared Clean Energy Facilities (SCEFs) in Connecticut, including an overview of anticipated benefits and costs.

During the CGA's 2014 legislative session, the Energy and Technology Committee considered proposed bills (HB-5412: *An Act Concerning Shared Clean Energy Facilities*; and SB-353: *An Act Concerning the Development of Class I Renewable Energy Source Projects*, and working draft amendments [LCO-3885 and LCO-4100]), but did not recommend a bill for vote by the CGA. Issues regarding proposed legislation were raised by stakeholders including the Connecticut Department of Energy and Environmental Protection (DEEP), utilities, clean energy advocates and organizations, and the general public at a public hearing on March 4, 2014 and in discussions with the leadership of the Energy and Technology Committee.

This study provides an overview of SCEFs and issues regarding their development and use in Connecticut. The study report includes the following sections: 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, and Findings and Recommendations.

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 Shared Clean Energy Facility Program will be of interest to ratepayers seeking to reduce their electricity expense, while helping to achieve these goals.

Implementation of a Connecticut Shared Clean Energy Facility 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.

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; and technology challenges to assure that the intended benefits of distributed generation are achieved.

RECOMMENDATIONS

The CASE Study Committee's recommendations relate to the adoption of legislation to provide a framework for a SCEF program; requirements related to SCEF program operation and administration; a mandate for DEEP to engage in the rulemaking needed to develop detailed Program Rules for SCEF operations, and conduct a value of clean energy analysis proceeding¹; and the need for additional examination of related issues and legislative considerations.

Adopt SCEF Legislation and Program Rules

A review of the development of SCEF projects in other states revealed that a legislative framework is needed for developers, organizations, and subscribers to invest in SCEF projects in Connecticut. Therefore, legislation should be adopted that is consistent with the current interconnection and siting requirements, and that is based on relevant aspects of the state's successful residential solar PV program and the Interstate Renewable Energy Council's (IREC) Model Rules. Additionally, the legislation should direct DEEP to:

- Develop SCEF Program Rules that contain the detailed provisions for the development, operation and administration of SCEFs.
- Adopt the SCEF Program Rules and initiate the SCEF Program within six months from enactment of SCEF legislation. DEEP should also be required to review the Program Rules at least once every three years, and to 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 Connecticut for the purpose of establishing SCEF billing credit rates.

Legislation should permit the development and operation of SCEFs that utilize any Class I renewable energy resource for electricity generation. Moreover, the legislation should provide flexibility to accommodate different business models to own and operate SCEFs, such as for-profit and not-for-profit organizations and the state's electric distribution companies (EDCs). Specific provisions that support the legislative framework for a SCEF program should be adopted, including the following:

- 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 EDC 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.

¹ 2014 Integrated Resource Plan for Connecticut, Connecticut Department of Energy and Environmental Protection (Hartford, CT) (Draft for Public Comment, December 11, 2014) 112

- The SCEF Organization, as generator, 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 for the electric energy produced by any SCEF located within its service territory consistent with the SCEF Program Rules, including that the term of such agreement shall be for the life of the SCEF.
- Using the billing credit rate as 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.

However, an interim billing credit rate shall be used for SCEFs established prior to adoption of SCEF Program billing credit rates based on the results of the value of clean energy analysis for clean energy resources by type.

- o 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 rate – for the life of the SCEF.

- 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.

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 [value of clean energy analysis]." ² Legislation should 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, but the first phase of the study should be

² DEEP Draft 2014 IRP 112

conducted for solar PV generation, since that is likely to be the most widespread type of SCEF developed, at least initially.

This proceeding should be a transparent process, involving all stakeholders. The legislation should mandate that the Public Utility Regulatory Authority (PURA) use the results of the DEEP value of clean energy analysis to conduct a ratemaking process to establish billing credit rates by type of resource for SCEFs, as well as for other types of clean distributed energy resource generators. Such analysis should also be used to inform a ratemaking process for the existing residential/commercial solar PV programs. 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.

Mandate DEEP to Adopt SCEF Program Rules

To provide additional guidance and a regulatory framework to support all stakeholders in SCEF development and operation and administration for the purpose of implementing the legislation authorizing SCEFs, DEEP should develop and adopt detailed program rules consistent with such legislation that include, but are not limited to, consideration of the following:

- Requirements for SCEF Organization registration, including filing the SCEF Organization's prototype Subscriber Agreement and the SCEF/EDC power purchase agreement with PURA
- Requirement for an EDC to enter into a power purchase agreement with a 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. This limit is based on the IREC Model Rules and best practices of other states, and helps to mitigate a SCEF having unsubscribed electricity generation. Additionally, Subscribers should have the option to increase or decrease SCEF 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.
- Subscription transferability that enables a SCEF Subscriber to transfer interest in a SCEF to another entity eligible to be a Subscriber for any reason.
- Timely reporting of SCEF Subscriber information by the SCEF Organization to the EDC
- Subscription portability that enables a SCEF Subscriber to retain a Subscription upon relocation within the same EDC service territory
- 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 SCEF Subscribers shall be the interim billing credit rate as set forth in the SCEF legislation.

- REC ownership provisions as set forth in legislation
- Consumer protections and disclosures should be developed by DEEP in consultation with the Office of the Consumer Counsel and the Department of Consumer Protection. The IREC Model Rules and best practices (i.e., 16 CFR Part 260: Environmental Marketing Guidelines, “Green Guides”) should be used as guidance. SCEFs should be required to provide potential subscribers with this information prior to purchase of a Subscription, as well as including it in the Subscription agreement.
- A recent energy home or business efficiency audit should be required for a SCEF Subscriber to be eligible to participate in the SCEF program. For homeowners, this requirement is the same as for the Connecticut Green Bank’s (CGB) residential solar PV program. For renters, a modified program should be created.
- Develop a low-income household component of the SCEF program. Several low income programs developed by others are referenced in the Case Studies section of this report.
- Reporting requirements to the legislature regarding SCEF program outcomes.

Also, DEEP should create a website that includes all SCEF Program information to assure that interested stakeholders and potential SCEF Subscribers have accurate and timely information about the program. In addition, it is recommended that DEEP develop financing and incentive options in collaboration with the CGB, to encourage SCEF development and participation – including low-income household participation – as a way to meet the state’s renewable energy resource electricity generation goals. The CGB’s current programs should be considered for expansion or modification to include eligibility for SCEF owners and SCEF Subscribers.

Other Related Issues to be Considered

The following issues related to SCEFs and increasing penetration and use of clean energy resource generators, and intermittent clean distributed energy resources, and other distributed energy resources, 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 EDC business models with performance incentives for supporting deployment and use of distributed generation (such as what currently exists for energy efficiency programs)
- 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. A study on complementary technologies, if authorized by legislation, as recommended in this report, will inform these efforts.

Additional Legislative Considerations

In addition to recommendations specific to the SCEFs, several other related legislative initiatives were identified for consideration by the General Assembly.

- 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, and to 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.
- Revise the Clean Energy Options Program³ to provide that funds collected are used to construct clean energy resource electricity 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 60 days to choose to stay with current company that they had selected; if the ratepayer makes no election by the end of that period, default enrollment would shift to new program. Participants who chose to remain with the company selected (old program) and not move to the new program would have the option to shift participation into the new program at any time. The voluntary financial support of ratepayers will be used to help Connecticut achieve its clean energy goals for the benefit of all Connecticut ratepayers.

³ A voluntary program that provides ratepayers an option to pay extra on their electricity bill by selecting one of two companies that purchase clean energy or build clean energy generating facilities (anywhere in the US or Northeast). Currently about 25,000 Eversource Energy and UI customers participate in the program, with annual contributions of approximately \$2.5 million.