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Executive Summary

The Northeast Solar Energy Market Coalition was a unique coalition of state-level solar business associations organized to bring a regional emphasis to solar market development in the Northeast. The Coalition operated with federal funding support and a 20% cost-share during calendar years 2015-2017. The total project budget was $750,000, which was dedicated to supporting the work of project staff and researchers. The Coalition's founding business members were the established state-level solar business associations in the region. Leadership and management for the Coalition was provided by the Pace Energy and Climate Center (Pace), a program of the Pace University Elisabeth Haub School of Law and regional leader in energy policy for more than 25 years.

The focus of the Coalition's work was (1) to comprehensively map, monitor, and report solar market conditions and developments in the Northeast through the establishment and updating of a website, nesemc.com; (2) to track and provide support as requested on solar-related projects, demonstrations, and other initiatives in the region; (3) to develop and engage with Coalition members and key solar market stakeholders through an outreach and education program centered on the market development topics of highest priority to members; and (4) to develop the foundation for continuation of the Coalition as a self-sustaining regional organization.

The Coalition was successful in demonstrating the value and effectiveness of organizing solar businesses around common regional issues relating to solar market development. Work products were delivered through a common on-line platform, webinars, and direct engagement with stakeholders.

Federal funds supported the Coalition in addressing regional issues around key subject matter themes fundamental to cost reduction and market growth: (1) full and fair market value for solar generation, (2) streamlined state-wide permitting processes, (3) processes for reducing unnecessary interconnection costs and procedural burdens, and (4) expanding access to innovative "green" finance products for solar market development. Federal funds supported hundreds of direct engagements, dozens of presentations and webinars, and research and analysis. One peer-reviewed paper was published in 2016, and a second is pending publication as of the end of the project term.

The Coalition comprehensively tracked active solar market projects, demonstrations, and other initiatives over the course of the project term. This tracking ensured that the Coalition was prepared to provide timely, targeted, and effective information and analysis for Coalition members and stakeholders in the face of a rapidly-evolving market environment. In particular, two initiatives were a special focus: (1) the community shared solar pilot project in Connecticut, and (2) the collaborative workshop process for assessing costs and benefits of energy resources in Rhode Island.

The Coalition members and staff developed a model for establishing a self-sustaining successor organization. This successor organization will address grid modernization, utility business model transformation, and beneficial electrification. The Coalition team is engaged in developing funding for the successor organization.

A list of selected Coalition project metrics includes:

Project Accomplishments

- Secured a commitment to collaboration from solar industry business associations operating in all 9 Northeast U.S. states.
- Went beyond simply identifying barriers to PV penetration, to lay out a “solar market pathway” for the region as a whole.
- Developed strategies for solar market policy development and improvements based on 4 key focus areas: solar valuation, interconnection, local permitting, and finance.
- Established an efficient, comprehensive, and replicable policy mapping resource base for the Northeast, tracking 9 distinct policy topic areas.
- Summarized the region’s solar market policies in a 52-page set of state and issue-specific fact sheets, published in 2016-2017, and updated quarterly.
- The project introduced dozens of law students to solar market policy by engaging them as researchers.
- Conducted at least 1 annual meeting of the Coalition each year.
- Engaged with more than 100 distinct stakeholders or events over the course of three years.
- Established a database that identified, characterized, and tracked more than 100 distinct activities (“PDOI” – projects, demonstrations, and other initiatives) in the region relating to the Coalition’s focus areas.
- Commissioned and published a 12-page interconnection policy study that detailed critical technical issues identified by solar developers across the region and presented process best practices.
- Published and publicized solar market finance fact sheets for 3 states—ME, NH, VT—lacking significant state-level renewable energy financial organizations.
- Conducted and recorded 2 rounds of state-specific solar market policy expert webinars (9 in 2016; 8 in 2017) with more than 150 viewings in 2017.
- Attended Solar Market Pathways (SMP) Network meetings, participated in quarterly calls, participated in community solar affinity group, and shared information via Basecamp.
- Developed a project proposal for an “Electricity Market Transformation Project” that serves as the next step in the evolution of the Coalition.

Final Technical Report – Northeast Solar Energy Market Coalition

Table of Contents

EXECUTIVE SUMMARY 2

SELECTED PROJECT METRICS 3

BACKGROUND 5

INTRODUCTION 5

PROJECT RESULTS AND DISCUSSION 7

CONCLUSIONS 15

BUDGET AND SCHEDULE 18

PATH FORWARD 19

REFERENCES 20

APPENDIX - STAKEHOLDER IDENTIFICATION AND ENGAGEMENT 21

Final Technical Report – Northeast Solar Energy Market Coalition

Background

The Northeast Solar Energy Market Coalition was originally conceived by one of the Coalition's founding members—SolarConnecticut, which recruited representatives of several regional solar business associations in the Northeast United States. These association leaders recognized that solar markets in the individual states were facing common issues and challenges, and that the focus on state-by-state solutions, as well as unnecessary competition between the states, had created a fragmented market and policy landscape. They recognized that national trade associations focused their efforts on national issues—like federal tax credits—and local associations focused on the most acute of many state-level issues—like specific regulatory proceedings and state and local legislation. Between those levels of focus, no single organization existed to address common regional issues. Common regional issues include unnecessary “soft” costs relating to interconnection processes and requirements, widely-varying and inefficient permitting and siting regimes, growing concerns over issues associated with net metering, and the need for innovative financing tailored to solar market development.

Regional business leaders recognized that if best-practices were shared through education and outreach, if stakeholders in several states were addressing common issues in a common way, and if the regional market environment were better harmonized, market growth in the region could be accelerated. As a whole, the Northeast could constitute a solar energy market larger than that in the state of California.

What started as conversations became an agenda for action when the U.S. Department of Energy SunShot Initiative Solar Market Pathways program and funding opportunities were announced. The solar business leaders approached the Pace Energy and Climate Center (Pace) at the Pace University Elisabeth Haub School of Law about providing proposal and project management support for a new regionally-based solar market coalition. The Northeast Solar Energy Market Coalition was the result of these efforts.

Introduction

The Coalition’s founding members were the established state-level solar business associations in the region. Leadership and management for the Coalition was provided by the Pace Energy and Climate Center (Pace), a program of the Pace University Elisabeth Haub School of Law and regional leader in energy policy for more than 25 years. Rather than trying to build an entirely new organization from the ground up, the Coalition was able to launch quickly and efficiently by forming as a union of existing organizations that already had experience and earned respect in the region.

The Coalition was launched through development of a formal charter agreement. The focus of the Coalition’s work was (1) to comprehensively research and report solar market conditions and developments in the Northeast through the establishment and updating of a website, nesemc.com; (2) to research and provide support as requested on solar-related projects, demonstrations, and other initiatives in the region; (3) to

develop and engage with Coalition members and key solar market stakeholders through an outreach and education program centered on the market development topics of highest priority to members; and (4) to develop the foundation for continuation of the Coalition as a self-sustaining regional organization.

With three years of U.S. Department of Energy (DOE) support, the Coalition was successful in demonstrating the value and effectiveness of organizing solar businesses around common regional issues relating to solar market development. While each local state market is ultimately unique, the premise of the Coalition's formation was validated. Federal funding support enabled the Coalition to improve the efficiency of education and outreach support and policy analysis. Work products were delivered through a common on-line platform, webinars, and direct engagement with stakeholders. As a result, the Coalition gained broad recognition among stakeholders as an active, engaged, and authoritative voice on solar market development issues in the region.

Federal funds were used to support Coalition staff and researchers. Federal funding enabled the Coalition to support state-level solar market participants in addressing essential issues that the state business associations did not have the time or resources to address themselves. The Coalition fostered a common regional dialogue around the Coalition's key subject matter themes fundamental to cost reduction and market growth: (1) full and fair market value for solar generation, (2) streamlined state-wide permitting processes, (3) processes for reducing unnecessary interconnection costs and procedural burdens, and (4) expanding access to innovative "green" finance for solar market development. Federal funds were amplified through private foundation cost-share funds awarded to Pace to advance topics of common interest, particularly solar valuation and market development.

Federal funds were also leveraged through project team member State University of New York-Albany and senior technical advisor Dr. Richard Perez. Dr. Perez' work focused on conducting research and analysis on policy and market mechanisms to support high-penetration solar markets. One peer-reviewed paper based on this research was published in 2016, and a second was submitted for publication prior to the end of the project term.

The Coalition comprehensively tracked active solar market "Projects, Demonstrations, and Other Initiatives" (PDOI) over the course of the project term. This tracking was essential to meeting one of the greatest challenges of the project—being constantly prepared to provide timely, targeted, and effective information and analysis for Coalition members and stakeholders in the face of a rapidly-evolving market environment. The resulting PDOI database ensured that Coalition staff were focused on key issues and opportunities emerging in the region, and that support to Coalition members and engagement with state-level stakeholders was timely and efficient. In particular, two areas of PDOI engagement were a focus of the Coalition team during the project. These initiatives were the on-going community shared solar pilot project in Connecticut and the collaborative workshop process to develop a framework for rate design and for assessing costs and benefits of energy resources in Rhode Island.

During the final stages of the award term, the Coalition members and staff focused on developing a model for establishing a self-sustaining successor organization. The team developed a proposal that sets its sights on the vital issues of electricity market transformation that are emerging throughout the region. These issues—grid modernization, utility business model transformation, and beneficial electrification—have emerged as the most salient regional issues of the day. The Coalition team began efforts aimed at developing funding for the successor organization.

The Coalition project involved substantial efforts focused on creating a more cohesive regional solar PV market in the Northeast U.S. A primary objective was to analyze state level markets and policies to find best practices that would lower project costs and increase PV penetration. From the start, the NESEMC project team was keenly cognizant of the prohibition of using federal funds for any lobbying or other similar related activities. The project team actively avoided any activity that constitutes lobbying and instead focused on becoming a trusted source of information and resources that filled critical gaps in understanding and best practices. The project team operated under strict modes of engagement with any elected or legislative stakeholders by engaging with these stakeholders by invitation on an educational and informational support basis only, and never advocating for or against policies, legislation or other government decisions. When non-project team Coalition members engaged in any activities that may be construed as lobbying, they acted strictly as individual organizations, and not on behalf of NESEMC. Coalition members were regularly reminded of these restrictions to ensure they did not represent themselves as speaking for the Coalition when engaged in such work.

Project Results and Discussion

Project Objectives per Proposal and Statement of Project Objectives (SOPO)

Project Vision - The vision for the Coalition project was that the Northeast United States—which includes the states of Maine, Massachusetts, Vermont, New Hampshire, New York, Connecticut, New Jersey, Rhode Island, and Pennsylvania—will become home to a more thriving and efficient regional market for solar photovoltaic technology. That vision would be realized through the work of a regional coalition of solar PV businesses, state-level clean energy associations, and others in partnership with the Pace Energy and Climate Center.

Project Objectives and Status **-** In order to realize the vision over the mid- and long-term (out to 2025), the Coalition committed to achieving the following objectives by the beginning of 2018:

1. The NESEMC must be autonomous and fully funded even as SunShot Solar Market Pathways funding winds down.
2. NESEMC will be the recognized solar market policy analysis and education leader in the region. Providing timely tools that can be used to educate decision makers setting the agenda for solar markets in the Northeast.
3. NESEMC will have a proven track record of tangible and measurable successes.

4. NESEMC and its analysis and education materials will be solidly integrated with the agendas of other major regional policy organizations.

Overall Results - The project will be continued at a "maintenance level" by Pace Energy and Climate Center, which involves maintaining a web site presence while seeking continuation funding from non-DOE sources. The project earned regional recognition as a source for timely, accurate, and helpful information and advice about the state of solar PV markets in the region. The project developed useful tools (described below) relating to solar valuation, interconnection, permitting, and finance that have been used in the region and can continue to support market growth. The Coalition project team and members identified best practices in valuation for solar PV, local permitting processes, and interconnection processes; provided technical support on a statewide shared solar pilot project in Connecticut; and documented how several states could affordably use green finance tools to deploy greater levels of solar. Coalition member organizations continue to use the tools and best practices provided through the Coalition's education and outreach materials. Coalition members agreed to support a new coalition mission and structure focused on advancing solar PV and other market development goals.

Task 1 – Establishing and Operationalizing the NESEMC (the "Coalition")

The milestones under Task 1 were fully completed during the course of BP1. These milestones establishing the administrative, accounting, organizational, and reporting systems necessary to comply with the project contract obligations. It also involved developing a Coalition charter, mission statement, organizational structure and processes for decision-making, as well as convening the first meeting of the Coalition. Coalition members included SolarConnecticut, Solar Energy Business Associations of New England ("SEBANE"), New York Solar Energy Industries Association ("NYSEIA"), Mid-Atlantic Solar Energy Industries Association ("MSEIA"), Renewable Energy Vermont ("REV"), and New Hampshire Sustainable Energy Association ("NHSEA").

Task 2 – Establish Regional Market Policy Leadership

The NESEMC project team actively identified and engaged with stakeholders throughout the project term. Target audiences included all major state and regional solar and clean energy stakeholder groups. All engagement activities with regulatory and legislative entities by project staff using federal funds were conducted by invitation or were related to informational forums not involving regulatory or legislative decisions.

Project staff and Coalition members participated in a wide variety of conferences, workshops, on-line discussions, webinars, and other engagement modes, using the opportunity to introduce the Coalition and its goals to stakeholders in the region.

Coalition staff developed a comprehensive taxonomy of stakeholders and target audiences, and used this list, represented in the Table attached as an Appendix below, to track and document engagement activities.

The Coalition project team continuously monitored and assessed the solar market policy landscape in the Northeast and identified opportunities for engagement in key market policy events, education, and other reputation-building activities in the Northeast.

Each year, the project team conducted a full formal update of the state-level solar market policy survey. The Coalition team introduced the complex world of state level solar energy policy to dozens of law students at the Elisabeth Haub School of Law who served as project interns. The Policy Landscape survey involved creating a taxonomy of nine key policy categories for all nine states within the Northeast. The project team developed an efficient and replicable tool for creating and maintaining an invaluable resource for those interested in solar energy market policy.

These documents served as resources for member organizations and others to quickly compare their state's policy to other states in the region. All of the documents have been archived by the Coalition team.

Solar Policy Surveys

In support of NESEMC, the Pace Energy and Climate Center's team of student researchers helped compile information on solar market relevant state policy from the nine Northeastern states.

All Policies

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20All%20Policies.pdf

Renewable Energy Goals

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20Renewable%20Energy%20Goals.pdf

Solar Customer Tariffs and Rates

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20Tariffs%20and%20Rates.pdf

Virtual Net Metering

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20Virtual%20Net%20Metering.pdf

Shared Solar

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20Shared%20Solar.pdf

Green Banks and PACE Financing

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20Green%20Financing.pdf

Permitting

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20Permitting.pdf

Licensing

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20Licensing.pdf

Solar Rights and Access

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20Rights%20and%20Access.pdf

Interconnection

http://nesemc.com/resources/policies/by_policy/NESEMC%20Solar%20Policy%20Survey%20-%20Interconnection.pdf

The Coalition team published updates to state solar market policy survey documents in Q4 2016 and Q1 2017

Task 3 – PDOI Participation

Identification of Regional Pilots, Demonstrations, and Other Initiatives (PDOI) was an on-going effort for the Coalition staff. Tracking PDOI was a more granular tool for understanding in real time the development of markets and provided an opportunity for sensing emerging trends. The Coalition team mapped PDOI activity against strategic engagement plans (Task 2) to inform those efforts. Maintaining and updating the centralized PDOI database involved work by Coalition staff and law student interns, providing dozens of interns over the course of the project with the opportunity to gain understanding of solar market activities and functioning.

PDOI identification was on-going throughout the project term via the centralized database supported by Pace student research. A snapshot of the PDOI database was included in quarterly progress reports. The PDOI database ultimately identified, characterized, and tracked more than 100 distinct activities in the region relating to the Coalition's key focus areas (solar valuation, interconnection, permitting, and finance).

Early in the project term, the Coalition completed a strategic review of policy issues most significant to market development from the perspective of solar PV businesses. These issue areas—solar valuation, interconnection, permitting, and finance—guided tracking, engagement, and outreach activities throughout the project term.

Strategic Research and Engagement Priority Issues

The dynamic solar market environment in the Northeast compelled a strategic focus on priority issues that were regional in nature. Early in the project term, the project team convened a planning session with Coalition members to identify key topics of project focus.

Solar Valuation - Solar valuation issues addressed the technical issues related to the compensation rate that solar facilities earn when they generate electricity. Because Coalition members were state-level business associations, the focus was on rate design for distributed and shared solar .

Solar valuation was also a topic of policy update webinars hosted by the Coalition. More than 150 individuals attended or viewed recordings of the 2017 solar policy webinars.

The Coalition leveraged private funding to establish and operate the Value of Solar Center of Excellence (VOSCOE). VOSCOE is a web-based national resource of the state of the art and deep analysis behind solar valuation discussions and activities through the U.S.

Interconnection - Coalition members in the Northeast region identified interconnection as an opaque and high-cost process managed by more than twenty different utilities and state regulatory agencies, and exhibiting vast intrastate and interstate discrepancies, even within single utility jurisdictions. These challenges make solar projects more difficult and more expensive to build. The Coalition team requested and received technical assistance support from the Interstate Renewable Energy Council ("IREC") for an extensive analysis of various interconnection polices at ten different utilities operating across the Northeast states. The Interconnection Requirements for Solar report (http://nesemc.com/resources/Interconnectionrequirementsforsolar.pdf) confirmed that these utilities, some working in the same state and with abutting territories, have different policies to manage the same issues (anti-islanding, power factor requirements, etc.). The report exposed the need for more conversation at the state level about harmonizing interconnection policies and reducing project costs, in order to open markets to higher PV penetration.

The key conclusion of the Coalition's work on interconnection is that engagement and shared learning through Interconnection Technical Standards Working Groups similar to those operating in Massachusetts and New York is the best-practices process solution for identifying and resolving interconnection problems. These groups bring engineers from PV developers and utilities to the table to discuss how both parties can work together to find resolutions of mutual benefit.

Permitting - Streamlined solar permitting was identified as a priority due to the variation in costs and procedures across the region and within each state. Permitting can even vary in each municipality. By reducing these soft costs associated with solar deployment, higher penetration at a more affordable cost would be possible. The Coalition initially introduced best practices in permitting to Coalition members and stakeholders.

The Coalition's education strategy was to support solar PV market growth by documenting actual savings at the local level resulting from improved permitting processes. Coalition members made it clear that streamlining permitting at the local level would not occur unless data showed that municipalities would not be adversely affected (i.e. lost permit fees, additional costs). Working with the CT Green Bank, the Coalition team engaged researchers at Eastern CT State University who were introducing "Sustainable CT." That initiative in turn borrowed from a NJ model and involved efforts to educate local officials about sustainable practices and recognize them for proactive steps to increase sustainability within local town government operations. As a result of our efforts, Sustainable CT planners decided to include PV permit streamlining as a category for recognition. Working with CT Green Bank staff, Coalition staff were successful in getting the program to use the Solar Foundation's SolSmart points system as the basis for recognizing municipalities. Solar installers in

Connecticut are being matched with municipalities that agree to pursue the Sustainable CT designation for PV permit streamlining.

The Coalition played an early role as a provider of information to RI stakeholders about the concept of permit streamlining. The Coalition gained recognition as an established expert on the issue.

Finance - Financial innovation and product development is an issue of importance in smoothing the boom-bust cycles of solar PV investment and project development. The Coalition partnered with the Coalition for Green Capital to better understand the regional landscape and identify best practices among the states in the region. The Coalition for Green Capital ("CGC") is the leading expert on Green Bank institution creation and financing. For nearly a decade, CGC has partnered with over 15 states and with multiple national governments to help them understand the Green Bank model and implement new public-private financing solutions in their market. A 501(c)(3) non-profit, CGC has designed and created Green Bank institutions that have spurred nearly $1.5 billion of total clean energy investment. Through its network of operating Green Bank practitioners and consulting and policy expertise, CGC can deliver Green Bank best practices to policymakers and spur greater investment in clean energy with reduced reliance on public dollars. CGC is funded by some of the most prominent climate-focused foundations.

The Coalition team also reached out to the Union for Concerned Scientists (UCS), which had recently completed a report analyzing green bank potential for the state of Michigan. That UCS report showed that a small state investment would go a long way toward leveraging sizable private investments that would result in significantly higher PV penetration in Michigan. UCS agreed to work with the Coalition and paid for the services of Meister Consultants to review green bank potential in Maine, New Hampshire, and Vermont. The findings were quite positive and were shared through a press release picked up in several Northeast state media outlets. The findings were also shared with the respective Coalition members. The experience was an effective effort on a key Coalition issue and served to strengthen the Coalition's reputation as a regional market policy leader.

Though some adjustments were required, the Coalition project achieved its overall milestones. The Coalition team ensured 100% compliance with reporting and accounting requirements and conducted at least one formal annual meeting of the Coalition each year.

The Coalition team engaged with more than 100 distinct private and public organizations in the Northeast over the project term and established or enhanced existing relationships with most of those organizations. The engagement effort created a workable and replicable taxonomy for an engagement strategy, including characterization of target stakeholders, development and reliance on strategies focused on the needs of those stakeholders, and leverage of existing relationships. The goal of establishing the Coalition team as a regional market policy leader was accomplished.

The Coalition team established an efficient and comprehensive policy mapping resource base available to anyone interested in studying solar market policy in the Northeast.

Managed correctly, this tool has the potential to become the main clearinghouse for information on best practice policies in the region that would help achieve the overall goal of synchronized policy across the region. The project introduced dozens of law students to solar market policy. While the website resource did not include trackers to support an analysis of web site visits and utilization, anecdotal evidence based on inquiries and referrals suggests that the resource enjoyed some level of use by the interested public. Adding such tracking tools would allow site design and content tailoring in the future.

The Coalition team met the objectives of the Strategic Engagement Task (Task 2) by successfully engaging on the high-priority solar PV-related market policy activities in the region during the project term. The Coalition played a vital role as an objective and reliable source of information and resources, enabling informed decisions about the market opportunities for solar PV. The Coalition team met the objective of the Projects, Demonstrations, and Other Initiatives Task (Task 3) by establishing and maintaining a PDOI database and tracking methodology that enabled truly comprehensive coverage of solar PV developments in the Northeast. Coalition members participated as stakeholders in high-priority PDOI. The Coalition team engaged with the Connecticut Shared Solar Pilot program and the Rhode Island Rate Design and Valuation collaborative working group.

Tracking all state-level solar-related PDOI over the project term served to validate the Coalition's strategic focus and maximized the value of education and outreach efforts. The Coalition team stablished a database that identified, characterized, and tracked more than 100 distinct PDOI activities in the region relating to the Coalition's focus areas. Sharing this information across the region contributed to a robust policy environment. The range and volume of solar market development occurring in the region indicates the validity of the original project concept and the success of the Coalition in supporting solar market improvements in the region.

Regional Pilots - The idea of tracking real-world solar market activities—PDOI—was that markets are often shaped as much by development and deployment activities as they are by policy and regulations. The project proposal also envisioned the Coalition team actively engaging in a select few of the high priority PDOI activities that had the greatest regional import. Creating and maintaining the PDOI database was a relatively easy part of the Coalition's activities and provided valuable educational experiences to law student interns working at Pace. However, active participation in PDOIs was limited due to available resources, and the fact that many initiatives were very closely related to regulatory activities. Many PDOIs grew out of regulatory or legislative mandates and would have required engagement that would have been inappropriate under the project operating guidelines. For these projects, the Coalition left active engagement to state-level business associations and their members.

The project proposal also envisioned Coalition participation in "PV-Friendly Pilot Projects" during the project term. The idea was that where regional utilities initiated solar rate and deployment projects, the Coalition team would participate in the pilot projects as stakeholders. The Coalition team did carefully track and engage in two important PDOI activities during the project term. These projects, involving the on-going

project to develop shared solar demonstration projects in Connecticut, and the collaborative workshop process on solar valuation and rate design in Rhode Island, aligned well with the Coalition mission and scope of engagement.

In Connecticut, the Coalition team served as a resource to stakeholders on program design, competitive solicitations and evaluation, and implementation. The Connecticut program was on-going throughout the project term. The Coalition and stakeholder partners remained actively engaged in monitoring and answering questions related to the Connecticut shared solar pilot program administered by the state Department of Energy and Environmental Protection (CT DEEP).

In Rhode Island, the Coalition team participated in a year-long series of collaborative and facilitated working group meetings aimed at generating a consensus-based informational report that was ultimately reported out to the Rhode Island Public Utilities Commission. The working group created a comprehensive benefit-cost analysis framework for electricity resources and a set of rate design principles. The Commission used the report to launch a separate proceeding related to Power Sector Transformation, at which point the Coalition team disengaged.

Task 4 – Stakeholder Outreach and Education

Key audiences and stakeholders were identified in the education and outreach plan finalized in Q4 2015 and updated in 2017 as part of activities conducted under Task 4. The goal of the outreach and education plan was to educate and support state-specific solar/clean energy associations in the Northeast behind the concept that states can accelerate the deployment of solar across the entire region by adopting best practices specific to the region.

With that in mind, the team largely determined outreach effectiveness first by looking at how it “pushed out” information to Coalition members on four core policy areas. Second, it reviewed what drives the decision at the state level to consider or “pull in” Coalition best practices information. And third, the team asked what, if anything, it could improve in its approach. The outreach process began with consultations with Coalition members to ascertain the important policy issues impacting solar energy markets in each of the region’s nine states; this understanding was continuously updated and re-validated.

The plan outlined the outreach and education strategy for the four policy areas of focus—value of solar, interconnection, permitting, and green financing. The plan was treated as a living document with alterations made as needed. In 2017, the plan was reviewed and assessed for durability and effectiveness.

The Coalition commissioned green finance fact sheets for three northeast states lacking dedicated state-level renewable energy finance organizations. The Coalition also collaborated with the Union of Concerned Scientists (UCS), which agreed to conduct analysis to support the project. UCS determined that the Coalition states reviewed could greatly increase private-sector investment in clean energy, while spurring job creation and economic growth, by creating a “green bank.” The data was publically released and covered by several media outlets.

The Coalition conducted substantial new research on state interconnection standards, and with input from Interstate Renewable Energy Council (IREC), and technical assistance from IREC, produced an interconnection policy analysis that was published to Coalition members and shared with stakeholders. The Interconnection Requirements for Solar report is at
http://nesemc.com/resources/Interconnectionrequirementsforsolar.pdf

Coalition staff also developed a state solar webinar series that hosted two rounds of webinars (only 1 webinar was hosted for New Jersey, however). Coalition team members developed and delivered more than 36 presentations highlighting the work of the Coalition, resulting in a library of outreach and education presentations.

The Coalition team met all of the objectives for stakeholder outreach and education. The Coalition team and members were already active leaders in solar market outreach and education in the Northeast. Coalition staff developed and updated an outreach and education plan, per Task 4. The plan guided development of outreach and education materials, sponsored studies, and outreach partnerships. Each of the state-level business associations that are members of the Coalition leveraged this work through their on-going activities.

Task 5 – Participating in the Solar Market Pathways Network

The NESEMC project team participated in the Solar Market Pathways (SMP) network update meetings, annual network meetings, and in the online sharing platform, Basecamp. The Coalition team fulfilled requests from the National Coordinator Team to update information on the Solar Market Pathways website. Coalition knowledge sharing events (webinars and other meetings) and materials (fact sheets) were shared with SMP awardees through Basecamp. The project team participated in the quarterly SMP team conference call and provided updates to teams. Members of the project team attended and participated in the Community Solar Affinity Group. While the NESEMC project is unique from other SMP projects in that it is geared towards policy harmonization in a multiple state region compared to other projects that are focused on a single state or topic, the Community Solar Affinity Group is a valuable resource to the NESEMC project because many of the Coalition's members are actively engaged in community and shared solar initiatives.

The Coalition team achieved its goals of participation in and engagement with the broader Solar Market Pathways Network, per Task 5.

Conclusions

The Coalition project demonstrated the validity of its founding concept—that an organization focused on often-overlooked or insufficiently-prioritized regional issues could add value to efforts that accelerate solar market development, especially in a region like the Northeast. There is a vital gap to be filled in addressing common regional priorities. Appropriately adapted to the unique features of other regions in the U.S., the project approach has potential to serve as a replicable model to address solar market harmonization in other locations.

The Coalition project demonstrated that there is significant commonality inherent in the issues that must be addressed to advance solar markets in individual states. A mechanism for transfer and translation of best-practices approaches can help reduce market development costs and more effectively reduce soft costs embedded in emerging market structures.

On balance, the Coalition effort was a success. As discussed above, the Coalition met its overall project objectives, though more work remains to be done primarily in terms of establishing a self-sustaining follow-on organization.

Research and Information Clearing House Function - A central clearinghouse approach targeted at the regional level like that adopted by the Coalition fills a void often overlooked by national-level trade associations and supports the shared learning that individual state-level organizations simply cannot afford. This is especially true in a market environment characterized by a high level of policy, market, regulatory, and legislative activity. While these shared learning benefits are real and commonly reported by stakeholders, they are difficult to directly measure—the benefits are associated with costs not incurred, delays not faced, and wheels not reinvented. As a result, project success metrics measured comprehensive market research coverage and publication, the development and execution of engagement strategies, and responses to requests for assistance.

The project team invested the time needed to understand the market conditions in each state in the region, supporting a core Coalition objective of building and enhancing a reputation as a market policy expert organization. This reputation in turn led to frequent invitations to make presentations, participate in discussions, and answer questions—creating a positive feedback loop for Coalition activities.

The Coalition team began to establish a foundation of thought leadership on solar market development in the region. Led primarily by technical advisor Dr. Richard Perez, Coalition staff and members collaborated on authoring and publishing a widely-cited paper laying out a vision for high penetration solar development. A successor paper that includes modeling a 100% solar solution for New York City was submitted for publication prior to the end of the project term.

The Impact of Policy Volatility - The Coalition project teaches that in the complex and dynamic environments that characterize solar markets, the resulting policy “volatility” creates significant opportunities and entry points for improving the solar market. Knowing and understanding what is happening, where it is happening, what issues are on the table, and what additional issues can be raised is vital intelligence for supporting efficient and effective outreach and education. The experience and reputation of the project team and Coalition members was invaluable in rapidly characterizing the policy environment and in shaping useful support to stakeholders in near real time. The Coalition team created short, focused policy briefs, participated in dozens of education and outreach calls, shared information in stakeholder meetings, and attended and led workshops, conferences, and panel discussions as part of this outreach and education.

Policy volatility in the Northeast over the project term also presented significant challenges to the Coalition. Every state in the region undertook some kind of major

policy or regulatory initiative during the project term. Because the project did not involve lobbying or direct regulatory intervention, the Coalition team found itself in a reactive posture for these important developments. The Coalition did not control the timing or the breadth of these initiatives and was therefore forced to constantly reassess the state of play and predict the needs of Coalition members and stakeholders.

Policy volatility also meant that the Coalition had to take great care in undertaking research activities that required significant time and effort. To address this challenge, the Coalition adopted several strategies. First, the team brought all Coalition members together at least once a year for an in-depth and in-person meeting that included situational assessments and market reviews. Second, the team conducted repetitive cycles of check-in calls with Coalition members to acquire deep understanding of the policy environment in each state. Third, the Coalition kept itself and stakeholders informed with two rounds of state-by-state solar policy update webinars. Fourth, early on, the project team convened the Coalition members around a strategic identification of policy priorities that guided longer-term research and engagement efforts. These four policy areas for regional policy harmonization—solar valuation, interconnection, state-wide permitting, and green finance—proved to be remarkably durable as Coalition priorities over the life of the project.

Team Member Experience and Expertise - The Coalition project structure also demonstrates that achieving these results more efficiently and cost-effectively is supported by staffing and organizing around pre-existing organizations that already have the subject-matter expertise and business sector networks. Taken together, the project team organizations have acquired many decades of cumulative experience working on solar market issues in the Northeast. The experience was invaluable in meeting the challenges of the dynamic market environment in which the Coalition operated.

Projects, Demonstrations, and Other Initiatives (PDOI) - In addition to market policies and issues, the Coalition started a database of Projects, Demonstrations, and Other Initiatives (PDOI) relating to solar development in the Northeast. Tracking these real-world solar market activities showed that markets are often shaped as much by development and deployment activities as by policy and regulations. The PDOI database was continuously updated and served as a valuable resource for discerning key market developments during the project term. The project proposal also envisioned the Coalition team actively engaging in the PDOI activities that had the greatest regional import. Creating and maintaining the PDOI database was a relatively easy part of the Coalition's activities and provided valuable educational experiences to Pace law student interns. However, active participation in PDOIs was limited due to available resources, and the fact that many initiatives were very closely related to regulatory activities. Many PDOIs grew out of regulatory or legislative mandates and would have required inappropriate engagement under the project operating guidelines. For these projects, the Coalition left active engagement to state-level business associations and their members.

The project proposal also envisioned Coalition participation in "PV-Friendly Pilot Projects" during the project term. The idea was that where regional utilities initiated

solar rate and deployment projects, the Coalition team would participate in the pilot projects as stakeholders. The Coalition team did carefully track and engage in two important PDOI activities during the project term. These projects, involving the on-going project to develop shared solar demonstration projects in Connecticut, and the collaborative workshop process on solar valuation and rate design in Rhode Island, aligned well with the Coalition mission and scope of engagement. In Connecticut, the Coalition team served as a resource to stakeholders on program design, competitive solicitations and evaluation, and implementation. The Connecticut program was on-going throughout the project term. In Rhode Island, the Coalition team participated in a year-long series of collaborative and facilitated working group meetings aimed at generating a consensus-based informational report that was ultimately reported out to the Rhode Island Public Utilities Commission. The Commission used the report to launch a separate proceeding, at which point the Coalition team disengaged.

The experiences participating in these activities in Rhode Island and Connecticut were valuable in building the reputation of the Coalition and as an outreach and education opportunity. The effort was therefore quite worthwhile, even if not as expansive as originally hoped.

Continuity - From its inception, the Coalition planned to use the federally-supported launch and operation phase of the project as a foundation for establishing an independently funded, self-sustaining follow-on organization. The Coalition did not succeed in standing up a fully operational successor organization prior to the end of the project term. The team has established an organizational template and a plan for funding. Project continuity is discussed in the “Path Forward” section.

Budget and Schedule

The total NESEMC project budget was $749,908, of which 20% was provided through cost share, evenly divided over the three years of the project term. The project budget was managed by Pace.

Project funds were spent to support project management, research, education, and outreach. The project team included several staff members from Pace, led by co-principle investigator Karl R. Rábago. The project team also included co-principle investigator Michael Trahan, who also serves as executive director of Solar Connecticut. The project technical advisor was Dr. Richard Perez, senior research associate with the Atmospheric Sciences Research Center at the State University of New York-Albany. Mr. Trahan and Dr. Perez were engaged as contractors to the project.

Federal funds were cost-shared by funding from private foundations that supported aligned projects with similar objectives. Funding from the John Merck Fund supported research relating to solar valuation under the Value of Solar Center of Excellence project. Funding from the Energy Foundation supported education and outreach activities in New York.

Coalition members were representatives of state level solar business associations and served the project at no cost. The original project design envisioned that coalition member organizations would operate as contractors to the project in order to receive

funding support and would provide cost-share to the project. Due to the proliferation of legislative and regulatory proceedings that arose in the Northeast during the Coalition project term, the business associations did not conduct fundable project activities. A project budget modification was executed to reflect this change from plans. Due to the high level of cost-share from other sources, the project still easily met its cost-share obligations.

The project budget was fully expended during the project term. No extension was requested.

Path Forward

A key feature of the Coalition project design was that a regionally-focused organization was needed to fill the gap between a national organization and state solar business associations. As the project term neared its end, Coalition members validated that this objective remains sound and necessary. The main take-away from the continuity planning efforts was that to be self-sustaining, and to operate in the regional space that the Coalition needs to occupy, a major shift in focus and structure is required for any successor organization.

Using a strategic planning approach, the Coalition team led business association members through an examination of potential future pathways at our final annual meeting. The unanimous consensus of the Coalition membership was that the individual state associations did not have the resources or the will to simply continue the project model by substituting state solar association resources for federal funds. Further, there is a major gap between nationally-focused funding sources and state-level funding sources. While the need for an organization with a regional market focus continues, there are few if any available sources for the basic market research and limited engagement model that the Coalition used.

The Coalition members recognized that the fundamental limiting factor to high-penetration solar market growth was the underlying electricity market structure. Based on guidance from members, the Coalition staff crafted a template plan for an Electricity Market Transformation Project that would build on the network of stakeholders and experience gained through the Coalition project. Coalition team members committed to lending their support to efforts to identify funding for the plan. As we close out the project term, the Coalition team continues to collaborate on turning the template into a proposal suitable for funding by foundations, business members, or some combination of both.

The Coalition team and members concluded that a key lesson learned is that the mission, form, and approach of a viable and fundable successor organization cannot be the same as that used for the Coalition project. A successor organization must be more proactive in engagement in regulatory, and perhaps, legislative forums, and be guided by and advocate for a specific vision of change in electricity markets. At the same time, federal funding that enabled NESEMC has been essential in building the experience and reputation necessary to credibly propose the region-wide electricity market transformation project that can logically follow from the Coalition effort.

Finally, several project team members are committed to continuing and expanding the high-penetration solar market work supported by the Coalition during the project term. A subset of the project team has developed and submitted funding proposals for such follow-on work.

References

Northeast Solar Energy Market Coalition website

http://nesemc.com

Value of Solar Center of Excellence

http://voscoe.com

Interconnection Report

https://goo.gl/wTjyHe

Green Banking Fact Sheets

Vermont: https://goo.gl/ED44e2

Maine: https://goo.gl/vgEDZZ

New Hampshire: https://goo.gl/6BrfXU

Miscellaneous Coalition Publications & Presentations

https://goo.gl/1CrA76

Pace Energy and Climate Center home page

http://energy.pace.edu

SolarConnecticut

http://www.solar-connecticut.org

NYSEIA

http://www.nyseia.org

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https://mseia.net

SEBANE

https://www.sebane.org

REVermont

http://www.revermont.org

NHSEA

https://www.nhsea.org

Appendix - Stakeholder Identification and Engagement

TARGET AUDIENCE	ENGAGEMENT ACTIVITIES
Solar PV business associations and businesses	Comprehensive engagement with and outreach to the solar business industry in the Northeast was a design feature for the project. Coalition members included SEBANE, the Solar Energy Business Association of the Northeast (Massachusetts, Maine, Rhode Island); NYSEIA, New York Solar Energy Industries Association; MSEIA, the Mid Atlantic Solar Energy Industries Association (Pennsylvania and New Jersey); REV, Renewable Energy Vermont; NHSEA, the New Hampshire Sustainable Energy Association; and SolarConnecticut. Each of these member associations extended and amplified the Coalition's reach and engagement with solar businesses in the Northeast. Coalition staff participated as presenters at statewide and regional conferences convened and heavily attended by solar businesses in the region. These presentations were focused on issues that had been identified as key issues by Coalition members, relating to solar valuation, interconnection, permitting, and project finance (expansion of Green Bank concepts). The Coalition also initiated and led a number of subject matter-specific projects that involved specific companies and organizations.This engagement approach was designed to serve the goal of identifying, developing, and disseminating best practice approaches through Coalition member companies. For example, the Clean Energy Collective (CEC), Zapotec, Greenskies, Solect, Revision Energy, Ampion, Wind Energy Development (solar PV / renewable energy development businesses) all participated in the Coalition-led Interconnection Working Group to review research funded through Technical Assistance on interconnection technical standards and offer guidance and recommendations for use throughout the region. Borrego Solar has committed significant time to leading efforts to implement a key Coalition goal of establishing Technical Standard Interconnection Groups in MA & NY. In addition, Ross Solar, Posigen, Direct Energy, Sunlight Solar, Sungevity (solar PV / renewable energy development businesses) all worked with Coalition member SolarConn in a regulatory docket to update small DG interconnection guidelines. This particular example demonstrates the way the Coalition's subject matter leadership inspired and led to results-oriented engagement by Coalition member businesses.

TARGET AUDIENCE	ENGAGEMENT ACTIVITIES
Solar advocates and associations	Throughout the project term, Coalition staff and members stayed actively engaged with a wide range of solar energy advocates, including Vote Solar, ACE-NY, SEIA, NECEC, InterSolar, Acadia Center, Clean Energy States Alliance, and others. Coalition staff regularly fielded calls from solar advocates and associations seeking information and educational materials, answers to questions, connections to resources. Pace maintained membership in ACE NY and subscribes to newsletters from several regional solar industry-related organizations in order to track developments meriting pro-active engagement. Pace monitored and communicated to a range of state-level working groups with advocacy, business, and association membership. These include working groups in NY on Value of DER, New Energy Rhode Island (NERI) in RI, Mass Solar in Massachusetts, and others.
Energy industry finance institutions and associated entities	Coalition staff actively engaged with solar developers, financial institutions, and policy advocates on issues related to solar and DER financing. During the project term, several states moved to advance public finance agencies as a complement or alternative to direct incentives and subsidies to solar energy development. The Coalition engaged with the Coalition for Green Capital, representatives of existing state Green Banks, and the Union of Concerned Scientists on renewable energy finance issues.
Environmental sustainability NGOs	Track and publish information about clean energy advocacy activities in NY and the region.
Electric utilities, companies and providers	Coalition staff provided educational information pertaining to interconnecting solar to utility company staff on a regular basis throughout the region. Secured one CT utility's interest in creating an Interconnection Technical Work Group to bridge knowledge gaps. Staff participated in a general inquiry workshop in Rhode Island.
Broad-based business and economic development associations	Project staff frequently attended energy-related conferences as invited speakers and engaged with business leaders. Due to the technical nature of the Coalition’s objectives, engagement with non-energy associations was minimal.
Energy and regulatory bodies and associations	Coalition staff maintained an informal relationship with Public Service Commission/Public Utility Commission commissioners and staff in several states in the region, including NY, CT, RI, ME, and VT.

TARGET AUDIENCE	ENGAGEMENT ACTIVITIES
Universities and R&D institutions/agencies with clean energy programs	The Coalition team included Dr. Richard Perez as technical advisor. Dr. Perez has an extensive reputation and network in academic communities. Under Dr. Perez' leadership, several Coalition members published a widely-cited article in a peer-reviewed academic energy journal addressing achievement of high penetration solar. As this report is submitted, a follow-up article is being edited for publication. Project co-director Karl Rábago is based at the Pace University Elisabeth Haub School of Law and used his academic community connections to engage with other academic institutions in the region. Coalition staff worked with Yale University researchers to develop a process for ranking municipalities based on their efforts to adopt pro-solar policies. Partnered with The Institute for Sustainable Energy at Eastern Connecticut State University's Sustainable CT program to urge cities and towns to adopt streamline permitting policy. Coalition staff have had meetings or conversations with representatives of almost every major state-level agency with an energy portfolio in the Northeast. These organizations include the public service commissions and state energy offices in each state.
Other	IREC – Karl Rábago serves on the board of directors of the Interstate Renewable Energy Council (IREC), which creates frequent opportunities for stakeholder interaction. Rábago also serves as the Chair of the Board of the Center for Resource Solutions, which administers the Green-e Certification program for renewable energy-based products, including RECs. Rábago also serves on the Board of ACE-NY, an advocacy organization that advances clean energy market growth in New York. Coalition staff also conducted webinars that provided solar market and policy updates for each of the states in the region. While these webinars were open to all participants, audience was primarily solar advocates and businesses. Coalition staff secured several media placements announcing the organization and mission of the Coalition when it was formed.