

Evaluation of Rhode Island Distributed Generation Policies

Stakeholder Workshop #3: Methodology for Estimating DG Capacity Need and Evaluating Potential DG Policy Approaches

March 27, 2023

Sustainable Energy Advantage, LLC, on Behalf of the Rhode Island Office of
Energy Resources

Part I: Determining Potential DG Capacity Need



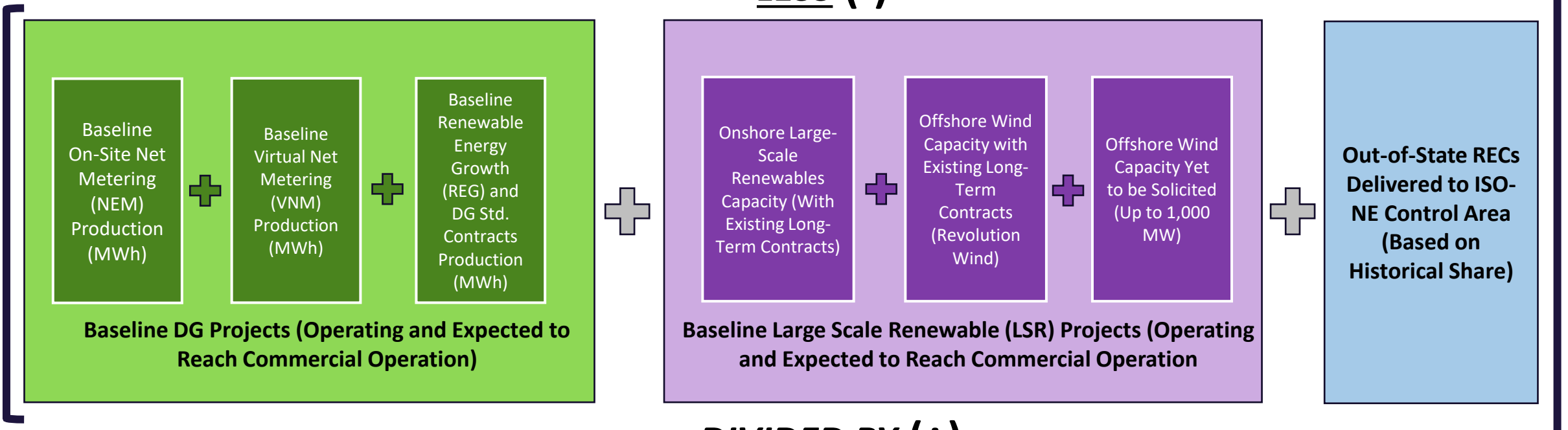
Benefit–Cost Analysis Scope: Charting DG’s Role on the Path to 100%

- In order to determine which DG policy pathway Rhode Island should choose, it is necessary to understand the quantity of DG needed to reach with Rhode Island’s 100% RES by 2033
- Calculating this quantity across multiple scenarios allows for appropriate comparison of potential alternative futures
- To reach this target, it is necessary to establish, net of expected compliance demand:
 - The statutory DG baseline (associated with both projects already operating and projects in the development/construction pipeline) associated with statutorily-authorized programs (REG and net metering) through the end of 2033; and
 - The amount of additional DG required to reach commercial operation by the end of 2033, net of the statutory DG baseline and other renewable energy projects 1) already operating, 2) in the pipeline and 3) yet to be procured.
- Given typical time from qualification/procurement to commercial operation, this requires SEA to develop resource portfolios associated with each policy pathway comprised of projects that are procured (or otherwise qualified) no later than:
 - **2030** for DG projects greater than 1 MW;
 - **2031** for projects 25 kW-1 MW, and
 - **2033** for ≤ 25 kW projects
- Projects would operate for their full useful lives thereafter

Calculating Rhode Island's Potential DG Capacity Gap in 2033

Total Compliance Demand Associated with Meeting 100% by 2033 RES

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Total Expected DG Capacity Factor by Project Type



Total Hours in One Year (8,760)

Proposed Approach to Calculating Compliance Demand

- To stay on a statutory 100% RES by 2033 pathway, RI Energy must procure sufficient RECs to meet the following targets (which are denominated relative to the previous year):
 - An additional 4% of retail electricity sales in 2023;
 - An additional 5% of retail electricity sales in 2024;
 - An additional 6% of retail electricity sales in 2025;
 - An additional 7% of retail electricity sales in 2026 and 2027;
 - An additional 7.5% of retail electricity sales in 2028;
 - An additional 8% of retail electricity sales in 2029;
 - An additional 8.5% of retail electricity sales in 2030;
 - An additional 9% of retail electricity sales in 2031; and
 - An additional 9.5% of retail electricity sales in 2032 and 2033 to achieve the goal that 100% of Rhode Island's electricity demand is from renewable energy by 2033 and each year thereafter.
- In RI, compliance demand in 2033 is the product of the percentage of required new renewables, multiplied by expected load in that year
- Therefore, **SEA proposes to adopt an electrification case that is in line with meeting 2030 (and thereafter) Act on Climate requirements** for calculating compliance demand through 2033

Operating DG Projects & DG Projects Expected to Reach Commercial Operation

- From its New England Renewable Energy Market Outlook (NE-REMO), SEA plans to include two main supply layers of DG project capacity
 - Operating project capacity (including baseline DG Standard Contracts project output, baseline REG project output, baseline on-site net metering project output and baseline VNM project output);
 - Total probability-derated project capacity in the REG (currently set to run through 2029 program year), on-site net metering, and VNM development, interconnection and construction pipeline
- Production from both main supply layers will be the product of the total probability-derated capacity, multiplied by their expected production
 - Probability derates are based substantially on a general probability of ultimate success (as well as timing), overlaid with specific interconnection probabilities of success
 - Probability-derated capacity in both layers assumed to operate to the end of their useful lives (25-30 years, depending on the project in question)

Operating Large-Scale Renewables (LSR) Projects & LSR Projects Expected to Reach Commercial Operation

- From its New England Renewable Energy Market Outlook (REMO), SEA plans to include four main supply layers of large-scale renewables (LSR) project capacity:
 - Operating Renewable Long-Term Contract (LTC) Projects;
 - Expected Offshore Wind (OSW) Capacity from Affordable Clean Energy Security (ACES) Act procurement (Revolution Wind 400 MW Capacity Tranche) (Generally Expected Online 2024-2025)
 - Anticipated OSW MW Yet to be Procured (600 MW-1,000 MW, Estimated 2029-2031)
- Production from all four supply layers will be the product of the total probability-derated capacity, multiplied by their expected production
 - Probability derates are based substantially on a general probability of ultimate success (as well as timing), overlaid with specific interconnection probabilities of success
 - Probability-derated capacity in both layers assumed to operate to the end of their useful lives (25-35 years, depending on the project in question)
- SEA will also assume some contribution from out-of-state RECs based on historical averages

Part II: Overview of Proposed DG Policy Approaches



Most Recent Proposed Legislation Making Amendments to Key Statutory DG Programs

- Net Metering Project Cap and Sizing Restrictions
 - [HB 5033 – An Act Relating to Public Utilities and Carriers – Net Metering](#)
 - [SB 506 – An Act Relating to Public Utilities and Carriers – Net Metering](#)
- Changes to Virtual Net Metering and REG Programs
 - [HB 5853 – An Act Relating to Public Utilities and Carriers – Net Metering](#)

Key Inflation Reduction Act of 2022 Provisions Relevant to DG Program Design in Rhode Island (1)

- Increase in maximum federal Investment Tax Credit (ITC, and successor Clean Energy Investment Credit (CEIC), effective in 2025) **from 22% to 30% if project fulfills prevailing wage/apprenticeship requirements** (with 6% base credit if it does not)
- Expansion of full value of ITC and CEIC (if meeting prevailing wage/apprenticeship requirements) to **include energy storage projects ≤ 5 kWh (including resources paired with solar PV projects)**
- Projects can now include interconnection property **regardless of whether an electric utility owns it** in the basis for calculating ITC's value
- Projects owned by ***by tax-exempt, governmental or tribal entities*** (e.g. local/tribal governments, public schools and nonprofits) claiming the ITC and CEIC can elect to receive their tax credit in cash, regardless of if they have a tax liability (a practice called “direct pay”)

Key Inflation Reduction Act of 2022 Provisions Relevant to DG Program Design in Rhode Island (2)

- Projects electing direct payments must either 1) **meet minimum domestic content thresholds**, or 2) **seek a waiver from Treasury/IRS** by demonstrating that domestic sourcing would increase costs by at least 25%
- ITC and CEIC-eligible projects can claim 10 percentage point **domestic content**, “**energy communities**” and **ITC-specific low-income/disadvantaged community bonuses** (10 and 20 percentage points respectively) only for solar, wind and paired energy storage <5 MW
- Owners of Low-Income Economic Benefit projects (which receive a 20 percentage point bonus) are expected to be required to have:
 - Ensure **at least 51% of their capacity serves low-income/disadvantaged community customers**; and
 - Provide **minimum utility rate discounts of at least 25%** to participating project offtakers
 - **DISCLAIMER: SEA/OER anticipate further guidance from the federal government to be issued in Q2 2023. Please see Appendix A, slide 22 for details of what is currently known.**

Inflation Reduction Act Ramifications for DG Program Design

- Assuming the provisions are not broadly changed or repealed, the law:
 - Provides **greater long-term tax credit certainty** to DG renewable energy market participants
 - Reduces the cost to Rhode Islanders of DG projects generally, and certain projects in particular (including those that can be sited on preferred sites and directly serve/benefit low-income customers)
- However, to maximize the value of the Act to ratepayers and society, such changes **likely require at least some degree of conforming changes to state renewable energy statutes**, including by providing a clear path and regulatory structure supporting renewable energy project investments

Main Cases (and Sensitivities) for Benefit/Cost Analysis

- Core Proposed Scenarios
 - Continuation of the status quo
 - An alternative pathway (relative to the status quo) in which changes are made to the NM, VNM and REG programs
- Objective of Scenario Analysis
 - Determine the benefit-cost impact of potential changes to the NM, VNM and REG programs (**including those proposed to date in legislation at the General Assembly**)
- Core Proposed Variations/Sensitivities
 - Assume that some or all eligible projects are incented to include paired energy storage of a threshold minimum capacity
- Objective of Proposed Variations/Sensitivities
 - Understand the upper and lower bounds of the benefit/cost impact associated with substantial deployment of energy storage, and assuming typical benefits and costs to the grid and society

Bounding Sensitivities Assuming Paired Energy Storage

- Over time, and with greater saturation in both areas close and distant from load, each additional kWh of renewable energy (particularly solar) that is not firmed by paired energy storage will sharply decline in value
- Furthermore, with more modern grids and grid investments, utilities may be in a position to require certain projects that are unable to target their injections into the grid to curtail their output at certain times
- When pairing with energy storage, renewable energy projects can gain a tangible degree of dispatchability that, many other states in the Northeast have determined, substantially increases their value to the grid, ratepayers and society
- However, neither the NM, VNM, nor the REG program, as currently constructed, currently provide clear, consistent and accessible revenue streams for projects that can provide these values
- Therefore, we propose to evaluate, in a simplified manner strictly intended to produce a bounding analysis, what the extent of these benefits could be, under the non-Status Quo pathways

DG Program Changes Across Cases

- **Net Metering:** For NM, we propose to model the program based on the current program design with the following exception:
 - For the cases representing an alternative to the status quo, there would be **no project size-to-load restriction**, but **excess energy (production in excess of annual customer on-site consumption) would be paid at ISO-NE wholesale energy prices (sometimes referred to as “avoided cost”)**, as proposed in HB 5033
 - **NOTE: “Avoided cost” is a term that, in New England, is compensation provided to any distributed generation project considered a “Qualifying Facility” (QF) under the federal Public Utility Regulatory Policies Act (PURPA). Please see [Rhode Island Energy’s QF tariff](#) for more details of what such compensation entails.**
- For VNM and REG, we propose **multiple potential changes to existing distributed renewable energy programmatic structures**, represented in the tables in the following slides for policymakers’ consideration

Virtual Net Metering

Policy Design Elements

Policy Design Element Potentially Subject to Change	Status Quo (Applying to Existing/Baseline + Incremental VNM MW)	Alternative Case (Applying to Existing/Baseline + Incremental VNM MW)
<i>Compensation Term</i>	No specific term (unlimited)	20 and 25 years
<i>Attributes Transferred to Rhode Island Energy</i>	ISO-NE wholesale energy	ISO-NE wholesale energy + renewable energy credits (RECs)
<i>Structure of Bill Credit Compensation to Projects Receiving Bill Credits</i>	For All Projects: Last Resort Service (LRS) + Transmission (T) + Transition (T) + Distribution (D) credits until 2050 (then public entities lose Distribution for 2050 and after)	<ul style="list-style-type: none"> For Projects <=1 MW: Maintain Status Quo For Projects 1-10 MW (or multiple adjacent 10 MW sites): Cost-based compensation for eligible VNM projects
<i>Eligible Accounts and Associated Capacity</i>	Projects serving municipalities, universities, schools, and hospitals (MUSH), other public entities, and agricultural customers uncapped, others capped or otherwise ineligible	Projects serving municipalities, universities, schools, and hospitals (MUSH), other public entities, commercial and industrial customers, low- and moderate-income customers, and agricultural customers uncapped, others capped or otherwise ineligible
<i>Disincentives for/Prohibitions on Siting on Certain Greenfield Parcels</i>	None statewide	Prohibit siting on core forest, limit VNM projects to preferred sites

Renewable Energy Growth (REG) Program

Policy Design Elements

Policy Design Element Potentially Subject to Change	Status Quo (Applying to Existing/Baseline + Incremental REG MW)	Alternative Case (Applying to Existing/Baseline + Incremental REG MW)
<i>Eligible Accounts and Associated Capacity</i>	40 MW/year eligible capacity, all accounts eligible, but project capacity serving said accounts capped by annual program capacity allocation	**TBD Additional MW/year eligible capacity , all accounts eligible, but project capacity serving said accounts capped by annual program capacity allocation
<i>Clear Impetus/Approach to Encourage Equity/Low- and Moderate-Income Customer Participation?</i>	None (CRDG incremental costs limited by statute)	Evaluating current CRDG framework in context of additional Inflation Reduction Act renewable energy bonus tax credits for LMI customers, in which bonus tax credits are greater than 30% investment credit value available to households and businesses
<i>Incentivizing Beneficial Siting</i>	None statewide	Allow the DG Board and OER to propose adders for projects on preferred sites through the development of the annual REG program ceiling prices and filing those before the Public Utilities Commission (PUC), through the annual REG docket proceedings and a ruling by the PUC
<i>Disincentives for/Prohibitions on Siting on Certain Greenfield Parcels</i>	None statewide	Prohibit selection of REG projects sited on core forest areas

****NOTE:** Though HB 5853 – An Act Relating to Public Utilities and Carriers – Net Metering calls for minimum annual REG capacity solicitations of 300 MW/year, the amount expected to be modeled in this analysis is intended to correspond to a share of the DG capacity gap to be calculated in line with slides 2-7 of this presentation.

Request for Comments



Due Date for Written Comments Related to this Workshop

- Please submit any written comments regarding subjects discussed at this workshop **no later than April 6, 2023 at 11:59 pm Eastern Time (ET)**
- Please send written comments **in a PDF attachment** (preferably on organizational letterhead if applicable) to Cal Brown (cbrown@seadvantage.com), copying me (jkennerly@seadvantage.com) and Karen Bradbury (karen.bradbury@energy.ri.gov)

Appendix A: Summary of Relevant DG-Focused Provisions of Inflation Reduction Act of 2022 (P.L. 117-169)



Investment Tax Credit (Existing §48 Authority)

- Credit Amount/Applicability to Eligible Resources
 - Increases maximum 2023 credit rate **from 22% to 30%** if project fulfills prevailing wage/apprenticeship requirements (with **6% base credit**).
- Expansion to New Resources
 - Expands eligibility to include energy storage ≤ 5 kWh (including resources paired with solar PV projects)
- Bonus Credit Eligibility:
 - Eligible for 10 percentage point **domestic content, “energy communities” and ITC-specific low-income/disadvantaged community bonuses** (10 and 20 percentage points respectively) only for solar, wind and paired energy storage < 5 MW
- Transmission/Distribution Interconnection Property for ≤ 5 MW
 - Projects can now include interconnection property **regardless of whether an electric utility owns it** in the basis for calculating ITC’s value

Investment Tax Credit (§ 48) Phase-Out

- Extension is available for projects starting construction by end of year (EOY) 2024.
- ***Statutory placed-in-service deadline (end of year (EOY) 2025) eliminated***, subjecting eligible resources to existing rules requiring ***4-6 years of “continuous construction”***.
- Base/full credit structure (and thus prevailing wage/apprenticeship) requirements effective date was in early 2023
- Ability to claim bonus credits (as well as interconnection property in ITC basis) open to projects ***placed in service in 2023 and thereafter***, but limited to those ***starting construction by EOY 2024***.

ITC (§ 48) Low Income/Disadv. Comm. Bonus Values (1)

- **Eligible Projects:** ITC-eligible solar and wind projects **<5 MW** (which appears to include ***both ITC-eligible solar and paired storage ILoPTC-eligible wind***)
- **Bonus Credit Values:**
 - 10 percentage point additional ITC value, based upon the otherwise applicable credit value, ***for solar projects that are in a low-income community***, as defined in §45D (the New Markets Tax Credit program); or
 - 20 percentage point additional ITC value for solar projects that are 1) part of a ***low-income residential building project***; or 2) a ***low-income economic benefit project*** where half the project's economic benefits go to recipients with income at 200% of the federal poverty line or below 80% of area median income

ITC (§ 48) Low Income/Disadv. Comm. Bonus Values (2)

- Available Capacity Limitations & Project Selection
 - Added credits would be limited to **1.8 GW per year nationwide** (with carry-over of unused capacity permitted).
- Capacity Allocation (for 2023 – approach for 2024 unclear):
 - **Category 1 (Located in Low-Income Community):** 700 MW (10 percentage point ITC bonus)
 - **Category 2 (Tribal Land):** 200 MW (10 percentage point ITC bonus)
 - **Category 3 (Low-Income Residential Building Projects):** 200 MW (20 percentage point ITC bonus)
 - **Category 4 (Low-Income Economic Benefit Projects):** 700 MW (20 percentage point ITC bonus)
- Application/Selection Timing
 - **Category 3 & 4 projects:** Applications accepted Q3 2023, selections TBD
 - **Category 1 & 2 projects:** Applications accepted TBD, selections TBD
- Phase-Out Approach/Effective Date: Same as core ITC (**placed in service 2023 and after**, but *starting construction by EOY 2024*)

Successor Clean Energy Investment Credit (CEIC) (§48E) (1)

- **Eligible Resources & Minimum Emission Requirements:** Any new resource with an emission rate “at or below zero” (net of carbon capture) is eligible (which functionally includes all non-biomass renewable energy)
- **Credit Amount/Applicability:** Same base (6%) and full rate (30%) structure as § 48 ITC, and same 1 MW threshold for prevailing wage/apprenticeship requirements
- **Bonus Credit Eligibility:** CEIC/CEPC projects are eligible for same bonus credits, including energy communities, domestic content, and projects ≤ 5 MW serving low-income/disadvantaged beneficiaries
- **Allowances for Transmission/Interconnection Property for Projects ≤ 5 MW:** Same ability to count such property in CEIC basis as for § 48 ITC
- **Phase-Out:** Phases out in 2032 or later (based on national achievement of certain emission thresholds)

Key IRA Changes for DG Projects: Direct Pay

- Full direct pay eligibility ***only permitted for use by tax-exempt, governmental or tribal entities*** for claiming the § 48 ITC (through 2024) and the § 48E CEIC (from 2025 until GHG targets reached and credit phased out)
- Projects electing direct payments must either 1) meet minimum domestic content thresholds, ***or*** 2) seek a waiver from Treasury/IRS by demonstrating that domestic sourcing would increase costs by at least 25%

Key IRA Changes for DG Projects: Domestic Content Requirements (for Bonus Credit/Direct Pay)

- Minimum Thresholds for Non-Offshore Wind Projects:
 - Project claiming bonus credit must utilize steel and iron manufactured domestically, and meet the following minimum shares of project cost for materials manufactured domestically:
 - **40%** for non-OSW projects starting construction 2022-2024;
 - **45%** for non-OSW projects starting construction in 2025;
 - **50%** for non-OSW projects starting construction in 2026; and
 - **55%** for non-OSW projects starting construction in 2027 and thereafter (or until the expiration of the Clean Energy Investment/Production Credits described later);
- Effective Date
 - Applies to projects **placed in service in 2023 and thereafter**