

Inflation Reduction Act of 2022: Summary and Impact on Markets for Clean Electricity in Rhode Island

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Stakeholder Meeting***

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Sustainable Energy Advantage, LLC

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Inflation Reduction Act (IRA) Provisions & High-Level Market Implications



Summary of Relevant Inflation Reduction Act Tax Credit and Spending Provisions

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Summary of Relevant Inflation Reduction Act Tax Credit and Spending Provisions

- Successor Clean Energy Production Credit (CEPC) and Clean Energy Investment Credit (CEIC) (both 2025-??)
- Greenhouse Gas Reduction Fund
- New Clean Hydrogen Production Credit (through 2032)

Core Structural Changes to Renewable/Clean Energy Credits (& High-Level Market Impacts)



Introduction of Base Credit Rate/Full Credit Rate Structure: How it Works

- **Base/Full Rate Structure for Various Credits:** The full historical credit rates for the existing ITC and ITC in Lieu of PTC (30%) and PTC (2.5¢/kWh, plus inflation adjustment) are restored, but subject to fulfilling minimum prevailing wage/apprenticeship requirements for Projects >1 MW
 - **Projects ≤1 MW:** All projects eligible for the full credit rate applicable to each credit, regardless of prevailing wage/apprenticeship practices
 - **Projects >1 MW:** Projects fulfilling prevailing wage/apprenticeship requirements eligible for full credit rate, but projects not fulfilling requirements only eligible for 20% of full credit rate
- **Prevailing Wage Requirements for Full Credit Rate (>1 MW):** Eligible taxpayers must pay Davis-Bacon prevailing wages for the given region and trade, or will be subject to substantial penalties for noncompliance (particularly willful noncompliance)

Introduction of Base Credit Rate/Full Credit Rate Structure: How it Works

- **Apprenticeship Requirements for Full Credit Rate (>1 MW):** Eligible taxpayers must employ certified apprentices to complete
 - 10% of total project labor hours for projects that commence construction in 2022,
 - 12.5% of total project labor hours for projects that commence construction in 2023; and
 - 15% of total project labor for any project that commence construction thereafter.
- **Stated (vs. Functional) Effective Date:** Projects commencing construction 1/1/2022 and after, **or projects commencing construction prior to 60 days following issuance of Treasury/IRS guidance** are exempt (our understanding: IRS guidance not expected for ~4-6 months)

Introduction of Base Credit Rate/Full Credit Rate Structure: Market Implications

- **Labor Requirements Cost vs. Benefit:** In general, the cost of meeting the labor requirements appears to be substantially less than the lost value from not meeting them
- **High Likelihood Nearly All Developers Will Opt for Full Credit:** Therefore, **we generally expect developers to meet them**, particularly for projects in 2023 and after (given that we do not anticipate guidance to be issued by the IRS until 2023 (or the final days of 2022 at the very earliest))

Domestic Content Bonus Credit: How it Works

- **Applicable Credits:** ITC, ITC in Lieu of PTC (ILoPTC), PTC, CEIC and CEPC
- **Bonus Credit Amount:** The value, which appears to be not subject to the base/full credit structure, is set at at:
 - **10 percentage point (not %)** increase in ITC, ILoPTC (and successor CEIC) value; and
 - **10% (not percentage point)** increase in PTC (and successor CEPC) value
- **Effective Date:** Applies to projects placed in service in 2023 and thereafter

Domestic Content Bonus Credit: Minimum Thresholds

- **Non-Offshore Wind (OSW) Minimum Thresholds:** 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);
- **OSW Eligibility:** Minimum OSW thresholds staggered relative to non-OSW

“Energy Communities” Bonus Credit: How it Works

- **Applicable Credits:** Credits able to monetize this bonus value include:
 - Investment Tax Credit (ITC) (Existing §48 Authority, through 2024)
 - (Successor) Clean Energy Investment Credit (New §48E Authority, from 2025-??)
 - Production Tax Credit (Existing §45 Authority, through 2024)
 - ITC in Lieu of the PTC (ILoPTC, Existing §48 Authority, through 2024)
 - (Successor) Clean Energy Production Credit (New §45Y Authority, from 2025-??)
- **Bonus Credit Amount:** +2 percentage points for base credit, added 10 percentage points for meeting prevailing wage/apprenticeship requirements for projects sited in an “energy community”

“Energy Communities” Bonus Credit: How it Works

- **Eligibility Terms:** “Energy community” is defined as
 - Any brownfield site,
 - Areas with “significant fossil fuel employment”; or
 - Census tracts or “immediately adjacent” census tracts where:
 - A coal mine has closed during the 2000s; or
 - A coal-fired power plant has close during the 2010s.
- **Effective Date:** Applies to projects placed in service in 2023 and thereafter

Bonus Credits – High-Level Market Implications

- ***Interaction with Advanced Manufacturing Credits Unclear.***
 - Overall, unclear at this point how impactful these credits could be,
 - However, degree of impact closely to ***how quickly Advanced Manufacturing credits advance new domestic supply chains***
- ***Success of Domestic Content Bonus Highly Dependent on Limited Domestic Steel/Iron Throughput:***
 - Furthermore, generally ***unclear how simple (in near/medium term) meeting a 100% domestic steel and iron requirement will be*** for non-offshore wind projects
 - **NOTE:** The (very few) new steel mills on the East Coast that have been announced are being developed mainly to serve expected OSW buildout

Bonus Credits – High-Level Market Implications

- **“Energy Communities” Regional Impact May be Limited to Brownfield-Sited Project:**
 - “Energy Communities” credit generally **unlikely to be as impactful as in other more historically extractive industry dominated areas** (e.g., previous coal and coal-fired power plant strongholds in PJM, MISO, Interior West and Southeast, or areas with significant fossil fuel employment, such as Texas, the Gulf Coast, and the Marcellus/Bakken Shales)
 - However, **brownfield eligibility could substantially increase solar (and paired solar/storage) potential** in New England and New York

Elective Payment (“Direct Pay”) Eligibility and New Tax Credit Transferability Rules: How it Works

- **“Direct Pay” Applicability:** Full direct pay eligibility is allowed for taxpayers for clean hydrogen and carbon capture credits, **but only permitted for use by tax-exempt entities** for the following clean electricity project-adjacent credits:
 - Investment Tax Credit (ITC) (Existing §48 Authority, through 2024)
 - (Successor) Clean Energy Investment Credit (New §48E Authority, from 2025-??)
 - Production Tax Credit (Existing §45 Authority, through 2024)
 - ITC in Lieu of the PTC (ILoPTC, Existing §48 Authority, through 2024)
 - (Successor) Clean Energy Production Credit (New §45Y Authority, from 2025-??)
- **New Tax Credit Transferability Rules:** However, the Act **creates new allowances for transferring the same credits listed above** from taxpayers with tax appetite to those who cannot otherwise secure tax equity from larger players
 - Change discussed herein **potentially allows for less complex structures with potentially lower costs of tax capital than “partnership flips” and “inverted leases”** that the strictures of previous tax equity rules dictated

Elective Payment (“Direct Pay”) Eligibility and New Tax Credit Transferability Rules: How it Works

- **Direct Pay Limits based on Domestic Content:** Projects wishing to do direct pay must either:
 - Meet the minimum thresholds; or
 - **Seek a waiver from Treasury** by demonstrating that domestic sourcing would increase costs by at least 25%
- **Increase in Carry-Back/Carry-Forward Term:** Increases the total years of “carry-back” from one to three (**which expands access to current-year tax equity** for deals) and increases the “carry-forward” term from 21 years to 22
- **Effective Date:** Projects **placed in service in 2023 and after** (applies to traditional ITC and PTC, clean hydrogen and other new CEIC and CEPC credits alike)

Elective Payment (“Direct Pay”) Eligibility and New Tax Credit Transferability Rules: High-Level Market Implications

- **Direct Pay Absence Felt by Industry:** Lack of direct pay for traditional renewable energy credits for taxpayers, rather than tax-exempt entities = biggest and most negative (from industry’s perspective) change from previous versions of the legislation
 - Without said rules, tax equity costs **unlikely to decline as much as expected (if at all)**, given the availability of substitute financing **will not push tax equity players as hard** to compress their margins to compete for deals
- **Unclear Impact of Transferability Allowances:** Though new transferability allowances could potentially increase the availability of TE, based on market participant feedback, it is **unclear if using transferred credits allows the party transferring (or receiving) the credit to claim MACRS/bonus** depreciation
 - However, increase in “carry-back” term from (one year to three) **could increase tax total equity capacity** in the system
 - That said, changes are so new/unknown as to make their impact on the tax equiunclear at this time

Elective Payment (“Direct Pay”) Eligibility and New Tax Credit Transferability Rules: High-Level Market Implications

- ***Municipality Direct Pay Participation Dependent on Risk Appetite:*** However, more municipalities could use direct pay, although only if:
 - They can source domestically; and
 - Municipal or tax-exempt entities are willing take on development and other execution risks more commonly known and understood by developers

Changes to Existing Renewable/Clean Energy Tax Credits for Corporate Taxpayers (& Market Impacts)



Investment Tax Credit (ITC) Extensions for Existing and New Resources Through 2024: How it Works

- **Credit Amount/Applicability to Eligible Resources:** Increases maximum credit rate from 22% (under prior law) to 30% if the project fulfills the prevailing wage/apprenticeship requirements (with base credit rate of 6%).
- **Expansion to New Resources:** Expands eligibility to include:
 - Energy storage with a minimum capacity of 5 kWh;
 - Linear generators (which can be used to generate electricity on-site by industrial customers, using hydrogen or natural gas);
 - Microgrid controllers; and
 - Biogas property that “converts...(or condenses)...biomass into a gas which consists of not less than 52% methane by volume”
- **Bonus Credit Eligibility:** Eligible for ***domestic content, “energy communities” and ITC-specific environmental justice (EJ) bonuses*** only for solar, wind and paired energy storage under 5 MW

Investment Tax Credit (ITC) Extensions for Existing and New Resources Through 2024: How it Works

- **Transmission/Distribution Interconnection Property for Resources ≤ 5 MW:** Projects can now include interconnection property (regardless of if the property is owned by the taxpayer) in the basis for calculating ITC's value;
- **Phase-Out Approaches/Effective Dates:**
 - Extension is available for projects "commencing construction" by end of year (EOY) 2024.
 - Base/full credit structure will take effect no earlier than **60 days following Treasury/IRS issuance of prevailing wage/apprenticeship guidance**
 - **NOTE:** It is our understanding this date will likely be in **2023, not 2022**.
 - 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***.
 - **Statutory placed-in-service deadline (EOY 2025) eliminated**, subjecting eligible resources to existing rules requiring **4-6 years of "continuous construction"**.

New Bonus Credits for ITC-Eligible Solar/Wind Projects for Low-Income/Disadvantaged Communities: The Basics

- **Eligible Projects:** ITC-eligible solar and wind projects (which appears to include **both ITC-eligible solar and paired storage ILoPTC-eligible wind**
 - **NOTE:** It is unclear if ITC-eligible storage paired with ILoPTC-eligible wind would qualify
- **Available Capacity Limitations & Project Selection:** Added credits would be:
 - Limited to **1.8 GW per year nationwide** (with carry-over of unused capacity permitted); and
 - Subject to **an “efficient process” (yet to be designed)** by EPA and Treasury
- **Phase-Out Approach/Effective Date:** Same as core ITC (**placed in service 2023 and after**, but **starting construction by EOY 2024**)

New Bonus Credits for ITC-Eligible Solar/Wind Projects for Low-Income/Disadvantaged Communities: Applicable Percentages

- 10 percentage point (not percent) 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 (also not percent) additional ITC value for solar projects that are:
 - Part of a **low-income residential building project**; or
 - **A low-income economic benefit project** where half the benefits go to recipients with income at 200% of the federal poverty line or below 80% of area median income (**for which shared solar projects qualify**)
- Additional credits **do not appear to be subject to prevailing wage/apprenticeship requirements** for receiving the additional bonus credit (unlike the “energy communities” and domestic content bonuses)

Investment Tax Credit Changes: High-Level Market Implications

- **Increased ITC to Offset Cost Pressure:** Higher ITC value likely to aid in offsetting higher CapEx and OpEx observed in recent two years (particularly for solar and offshore wind), and substantially accelerate deployment of ITC-eligible resources (particularly solar) once those cost pressures are resolved
- **Bonus Credits Could Drive Siting in Certain Preferred Locations:** When paired with bonus credits (particularly for brownfields) more solar siting is likely to occur on brownfields and in low-income areas (given the degree of added ITC)
- **Interconnection Changes May Speed (and Slow) Deployment:** Allowance to include interconnection in ITC (and ILoPTC) basis is a significant change that will both materially ease the amount of projects likely to drop out of distribution group studies and transmission (ASO) studies after a negative outcome. However, could also increase the number of applications and the degree of saturation, thereby requiring more (and more costly) interconnection

Investment Tax Credit Changes: High-Level Market Implications

- **Key Unknowns:**

- Though the accessibility of the EJ-focused program is not well known or understood yet, the additional credits benefiting EJ population **could have a disproportionate impact in Northeastern states (including Rhode Island) that tend to prioritize such benefits in its public policies**
- At this stage it is **unclear if minimum thresholds for non-OSW domestic content bonuses are achievable** (particularly given the unknown speed of buildout for domestic manufacturing)

PTC (and ITC in Lieu of PTC) Extensions for Various Resources Through 2024: How it Works

- **Credit Amount/Eligible Resources:** Establishes base credit of 0.5¢/kWh and full credit value of 2.5¢/kWh for landfill gas (municipal solid waste), trash (municipal solid waste), qualified hydropower, marine and hydrokinetic, and geothermal
- **Changes for Currently-Eligible Resources:** Eliminates 60% of PTC value step-down for onshore wind projects, and restores hydroelectric and marine/hydrokinetic energy to eligibility for the full credit.
- **Expansion to New Resources:** Expands PTC (and ILoPTC) eligibility to solar PV for first time since 2000s.
- **Applicable Bonus Credits (If Claimed):** Eligible for domestic content and “energy communities” bonus credit if placed in service in 2023 and after
 - **NOTE:** <=5 MW projects electing the ILoPTC are also eligible for 1.8 GW tranche of environmental justice bonus credits

PTC (and ITC in Lieu of PTC) Extensions for Various Resources Through 2024: How It Works

- **Transmission/Distribution Interconnection Property for Resources ≤ 5 MW**
 - Projects can now include interconnection property (whether or not the property is owned by the taxpayer) in the basis for calculating ITC's value;
- **Phase-Out Schedule:** Very similar to ITC, including:
 - Base/full credit structure takes effect 60 days following issuance of prevailing wage/apprenticeship Treasury/IRS guidance (likely to be in calendar 2023).
 - Extension is available for projects "commencing construction" no later than 2024
 - 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 commencing construction no later than 2024.
 - Eligible resources remain subject to existing rules requiring 4-6 years of continuous construction in order to remain "safe harbored" prior to being placed in service

PTC (and ITC in Lieu of PTC) Extensions for Various Resources Through 2024: High-Level Market Implications

- **Greater Impact on LSR than DER:** Overall, PTC changes most likely to impact large-scale resources (LSR) serving Rhode Island but sited in Maine, with small impacts for DER projects enabled by REG in Rhode Island for projects taking the ILoPTC
- **Disproportionate Regional Benefit for Utility-Scale Solar:** Most substantial impact for utility-scale solar PV, given that the PTC appears to be more favorable for the economics of utility-scale projects with upfront costs less than \$1/W
 - **Explanation:** Once costs get that low, the PTC at 2.5¢/kWh (+ inflation adjustment) can constitute more than half the amortized CapEx/OpEx of a project in the first 10 years (much higher than the ITC)
 - **Key unknown:** Will there be new IRS rules for solar PV's participation?
- **Onshore Wind Projects Benefit Less Substantially:** Wind projects utilizing the PTC (rather than the ILoPTC) will see a benefit from the retroactive (and forward-looking) removal of the 40% haircut to the credit, but siting challenges (and limited territory other than Northern Maine for projects at scale) will continue to focus most New England wind development offshore



Changes to Existing Renewable/Clean Energy Tax Credits for Individual Taxpayers (& High-Level Market Impacts)



Investment Tax Credit for Residential Clean Energy Property Extension Through 2034: How it Works

- **Credit Amount/Applicability:** Full credit rate of 30%, but current credit of 26% will remain in place until 1/1/2023
- **Previously-Eligible Resources:** Solar electric, solar water heating, fuel cell, small wind energy, geothermal heat pumps, and biomass fuel
- **Expansion to New Resources:** Expands eligibility to energy storage (both paired energy storage and stand-alone)
- **Bonus Credit Eligibility:** None
- **Phase-Out/Effective Date:** The credit would be in place at the full 30% value for 10 full years for projects placed in service (through 2032), then phase down to:
 - 26% for projects placed in service in 2033
 - 22% for projects placed in service in 2034; and
 - 0% for projects placed in service thereafter.

Investment Tax Credit for Residential Clean Energy Property Extension Through 2034: High-Level Market Implications

- **Potential to Offset Electrification Load Growth:** If implemented as enacted (and PV economics decline to \$1-\$1.5/W as expected by 2030) distributed solar, storage and geothermal heat pumps could displace a significant amount of load growth, even once electrification is accounted for
- **Longer-Term Credit Certainty = Rate Design Innovation?:** Improved economics likely to add major momentum to industry/utility pushes for additional rate design innovations (particularly submetering newly-electrified loads, time of use rates, etc.)

Investment Tax Credit for Residential Clean Energy Property Extension Through 2034: High-Level Market Implications

- **Enhanced VPP/Aggregation Opportunities?:** Favorable fundamental solar/storage economics could lead to emergence of virtual power plants/aggregations **as viable options during grid events driven by electrification or extreme weather**
- **Unclear Impact on Grid Saturation:** However, the same favorable fundamental economics could lead to (in varying degrees based on (slight) variations in deployment outcomes:
 - **Substantially enhanced grid saturation** on residential circuits (albeit less so if adopters also electrify their vehicles and HVAC); and
 - **Potential conflicts over new rate designs** (and the objectives of said rate designs)

Successor Clean Electricity Production & Investment Credits (2025-??) & High-Level Market Impacts

Successor Clean Energy Production Credit (CEPC) and Clean Energy Investment Credit (CEIC): How They Work

- **Eligible Resources & Minimum Emission Requirements:** Any new resource with an emission rate “at or below zero” (net of carbon capture) is eligible (which includes all non-biomass renewable energy)
- **Credit Amount/Applicability:**
 - **For CEIC:** Base credit rate of 6%, with full rate of 30% subject to meeting prevailing wage/apprenticeship requirements
 - **For CEPC:** Base credit rate of 0.3¢/kWh and full rate of 1.5¢/kWh (both subject to an inflation adjustment) subject to meeting labor requirements
 - **For All Projects ≤1 MW:** The taxpayer would receive the full rate regardless of the prevailing wage and apprenticeship practices of the taxpayer (same as for ITC?PTC)
- **Phase-Out Schedule:** For projects placed in service, the later of 1) the end of 2032 or 2) the year in which electric power sector emissions are 75% below 2022 levels (as calculated on a national basis), whichever is later
 - CEIC and CEPC eligibility for new credits would then phase down to 75% of full value in the year after the emissions threshold is reached, 50% in the year after that, and 0% in the following year

Successor Clean Energy Production Credit (CEPC) and Clean Energy Investment Credit (CEIC): How They Work

- **Election of Production or Investment Credits:** Taxpayers can elect either the CEIC or CEPC (rather than having eligibility determined by resource type).
- **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
- **5-Year MACRS Eligibility:** Allows all CEIC and CEPC-eligible projects to utilize 5-year MACRS depreciation (but unclear if it allows bonus depreciation, or at what level bonus will be available).
- **CEIC Allowances for Transmission/Interconnection Property for Projects ≤ 5 MW:** Same eligibility as for ITC and ILoPTC.

Successor Clean Energy Production Credit (CEPC) and Clean Energy Investment Credit (CEIC): High-Level Market Implications

- **Significant Uncertainty Until Rules Issued:** Much remains unknown about the impact of these credits, particularly:
 - **How long will they last**, if not repealed/modified? (2030s? 2040s, even?)
 - Will projects try to stay in the existing regime, or opt to receive the successor credits?
 - **Can the IRS write all the rules by the 1/1/2025 deadline**, and how will those rules look?
- **From Commence Construction...Back to “Placed in Service”:** Removal of the “begin...construction” language (replaced by placed in service) from the House bill related to CEPC and CEIC somewhat complicates the decision to opt for one program versus the other

Successor Clean Energy Production Credit (CEPC) and Clean Energy Investment Credit (CEIC): High-Level Market Implications

- **Major Drop in Compensation Between PTC/CEPC...:** In addition, 40% drop in value from the PTC to the CEPC (from a full credit of 2.5 ¢/kWh to 1.5¢/kWh) likely to cause more projects that are in the PTC eligibility “bucket” (wind, hydro, digesters, waste-to-energy, and others) to move to the CEIC if not able to start construction in 2024.
- **...But Major Aspects of Expanded ITC/PTC Regime Preserved:** However, preservation of much of the rest of existing regime (including the bonus credits, interconnection in the credit basis, and the allowance for 5-year MACRS depreciation, subject to the new rules by EOY 2024) could potentially ease the pressure for projects looking to start construction before the end of the ITC at the end of 2024.

Greenhouse Gas Reduction Fund (& High-Level Market Impacts)



Greenhouse Gas Reduction Fund: How it Works

- **“National Climate Investment Institutions” Investments/Eligibility:** Provides EPA with \$20 billion to spend, no later than September 30, 2024, in the following manner:
 - \$12 billion to invest in “National Climate Investment Institutions” (which must be not-for-profit institutions, including **public sector “green banks”**) in projects that reduce emissions
 - \$8 billion specifically set aside to invest in the same institutions, but in projects that **benefit low-income and disadvantaged communities**
- **State, Local and Nonprofit Low-Income/Disadvantaged Community Investments/Eligibility:** Provides EPA with a further \$7 billion to invest in state, local and non-profit programs to advance zero-emission projects in low income and disadvantaged communities no later than September 30, 2024.

Greenhouse Gas Reduction Fund: Market Implications

- **Broad Regional/National Expansion of “Green Bank” Model Likely.** \$27 billion to national climate investment institutions likely to spur:
 - Creation of new state-level “green banks”/“clean energy accelerators” in Northeast (e.g. in states that currently do not have them)
 - Significant expansions of capacity/reserves at existing public sector/cooperative green banks such as the Rhode Island Infrastructure Bank (RIIB), particularly programs that reduce the cost of financing for low income/disadvantaged communities;
- **Disproportionate Benefit to Northeastern States & DERs:** Northeastern states (including coastal states in PJM, New York and New England) likely to reap disproportionate rewards due to existing infrastructure and capabilities. Furthermore, DER/DG projects (including clean generation, storage and electrification) appear most likely to benefit disproportionately, relative to large-scale resources
- **2024 Disbursement Deadline Accelerates Impact:** September 2024 deadline for funds disbursement by EPA likely to dramatically accelerate such programs in the near term (depending in part on the allocation and selection process, currently unknown)

New Clean Hydrogen Production Credit (through 2032) & High-Level Market Impacts



New Clean Hydrogen Production Credit (through 2032): How it Works

- **Base/Full Credit Amount:** \$0.60/kg H for base credit, \$3/kg H for projects satisfying prevailing wage/apprenticeship requirements
- **Emissions-Based Credit Multiplier Amounts:** Credit multipliers equivalent to:
 - 20% for projects with a 2.5 kg-4 kg CO₂e lifecycle emissions rate;
 - 25% for projects with a 1.5 kg-2.5 kg CO₂e lifecycle emissions rate
 - 33.4% for projects with a 0.45 kg-1.5 kg CO₂e lifecycle emissions rate;
 - 100% for project with a lifecycle CO₂e emissions rate less than or equal to 0.45 kW

New Clean Hydrogen Production Credit (through 2032): How it Works

- **Allowances/Limitations for Overlapping Credit Claims:** Recipients can simultaneously claim the credit and claim the renewable PTC (or PTC for nuclear, not discussed herein) for the electricity, but can only take the ITC in lieu of the hydrogen PTC
- **Effective Date & Phase-Out Schedule:** Effective for projects placed in service no earlier than one year following date of enactment (August 16, 2022) when guidance must be issued

New Clean Hydrogen Production Credit (through 2032): Market Implications

- ***Green Hydrogen Poised to Disproportionately Benefit:*** As designed, the credit appears geared (per BNEF) to cause green hydrogen economics to overtake “blue hydrogen” economics by 2025 (thereby potentially causing “blue” projects enabled by carbon capture to have a very narrow (2023–2025) window of viability, at best)
- ***More IRS Guidance Needed:*** Overall, however, difficult to assess specific market implications without detailed IRS guidance on the finer details of the credit

New Clean Hydrogen Production Credit (through 2032): Market Implications

- **Key Unknowns:** These (among many) include:
 - **Will virtual PPAs or other synthetic instruments (e.g., RECs or a similar instrument) be permitted** to be used by hydrogen market participants to meet emission criteria and maximize tax credit value, **or must projects be directly connected?**
 - **Will broad adoption of hydrogen over fossil fuels occur by 2032** (and thus enable in-region hydrogen supply chains that could create demand for renewable electricity)?

Expected IRA Impacts on Renewable Energy Growth 2023 Program Year Ceiling Prices



IRA-Related 2023 PY REG Modeling Implications: Cost & Performance Assumptions (Overnight Capital Costs)

• CapEx Impact of Meeting Prevailing Wage Requirements

- Recently-enacted RI legislation requires projects greater than 3 MW to pay prevailing wage, along with IRA provisions requiring the same for >1 MW
- Market participants have indicated that this cost is **approximately \$55-\$60/kW_{DC}**
- **M.I.: Add \$57.50/kW_{DC} to previously-estimated installed cost values for Large Solar, Large Solar CRDG, Wind and Wind CRDG**

• CapEx Impact of Meeting Apprenticeship Hour Requirements

- **IRA provisions go further than RI law** by requiring certified apprentices to complete successively larger proportions of project hours (10% in 2023)
- SEA believes cost impact needs to be included (either as a specific value or percentage) but **needs more information** on what the incremental apprenticeship cost will likely be
- **M.I.: No change for 1st Draft prices, but SEA will request more information from market participants to substantiate a \$/kW_{DC} value (with supporting calculations) to include in the prices**



IRA-Related 2023 PY REG Modeling Implications: Interconnection Cost Inclusion in ITC/ILOPTC Basis

- **Distribution Interconnection Cost Inclusion in ITC (and ILoPTC) Basis**
 - Prior to IRA, ***interconnection costs were excluded from ITC & ILoPTC basis*** (and straight-line depreciated)
 - Including them in the basis increases the share of the project the ITC can compensate for (and thus increases value/reduces ceiling prices)
 - **M.I.: Include interconnection in ITC basis for all projects >25 kW and change depreciation schedule to same breakdown as for “generation equipment”**
- **Transmission Interconnection Cost Inclusion in ITC (and ILoPTC) Basis**
 - Some DG projects (though far from a majority in RI) are beginning to be assessed transmission upgrade costs, and more may be assessed such costs as cost allocation issues are debated
 - **M.I.: No inclusion of such costs in project basis until more information is known**



IRA-Related 2023 PY REG Modeling Implications: Tax Credit Selection (ITC vs. PTC) for Solar Classes

- Previous REG ceiling price modeling has confirmed that the PTC's 10-year duration results in NPV benefits that are substantially less than the ITC (and thus result in less economic benefit from using the PTC, as well as higher ceiling prices)
- However, given that the IRA makes solar PV eligible, some market participants have indicated that **at ~\$1/W, PTC confers more value than the ITC for large-scale solar (and paired solar/storage)**
- After expected cost increases that our team forecasted last year, only Large and Large CRDG are even in the vicinity of this price point
- **M.I.: Out of an abundance of caution, SEA to undertake supplementary Large/Large CRDG modeling to determine if switching to PTC confers more value to ratepayers, but is generally confident the ITC & ILoPTC will provide more ratepayer value**



IRA-Related 2023 PY REG Modeling Implications: ITC (Solar) and ILoPTC (Wind & AD) Value

- For projects ≤ 1 MW, ITC/ILoPTC value increases to 30% **without** min. labor standards
- SEA is certain ***the labor requirements' added cost (in exchange for full credit rates) is substantially less than the benefit*** of the full 30% ITC (and is unaware of a broad trend of non-hydro projects being unable to monetize the credit fully)
- **M.I.: Set ITC and ILoPTC value at 30% for all projects except hydro (which remain unable to safe-harbor due to FERC licensing delays)**



IRA-Related 2023 PY REG Modeling Implications: Sponsor & Tax Equity Share (and Impact on After-Tax Equity IRR)

- Starting in 2022 PY, PTC (and ILoPTC) expired, which reduced the assumed share of tax equity and increased the share of sponsor equity, **thereby increasing consolidated IRRs**
- In addition, ITC values had been scheduled to downshift from 26% to 22%, which would have reduced sponsor/tax splits (from 25%/75% to 40%/60%, respectively)
- With IRA enactment, **sponsor/tax splits corresponding to full value are restored** for all credits
- **M.I.: Restore sponsor/tax splits to 25%/75% for Solar, Wind and AD classes, but maintain existing splits for hydro (given assumption of no tax credit monetization)**



IRA-Related 2023 PY REG Modeling Implications: After-Tax Equity IRR (Tax Equity)

- Overall, **higher tax credit values will likely drive more tax equity supply**, and drive more competition for deals
- New credit transferability rules **could reduce need for complex lease and flip deals**
- However, it is unclear at this time 1) **what the TE supply/demand balance will be** and 2) if **new transferability rules reduce financing risks** (and thus TE IRRs)
- **M.I.: No change for 2023 PY at this time, but SEA will continue to monitor TE market in wake of IRA's passage**



Overarching Observations



Overarching Observations

- Fundamentally, clean energy tax credits and incentives are financing tools used to facilitate investment and improve the fundamental economics of projects receiving them.
- Therefore, ***the IRA is far and away the single most influential piece of state or federal legislation*** affecting fundamental economics and financing of clean energy (and clean energy supply chains) ever enacted.
- The Act is also likely to be the foundational/most influential piece of federal legislation for ***enabling the development of key adjacent industries*** (e.g. manufacturing, clean transportation and green hydrogen), as well as the ***sharing of benefits of clean energy with low income and disadvantaged communities***

...But With All that Said

- The clean energy industry remains in a period of enormous change and realignment, in which:
 - The **cost of debt has skyrocketed** (with the Fed raising interest rates)
 - **Hard/soft costs have risen faster** than historical rates
 - It is **unclear when supply pressures will abate**
- With IRA's passage, the most critical long-term state and regional clean energy market bottlenecks **are not fundamental economics or financing**, but instead are now:
 - Supply chains
 - Siting and land acquisition;
 - Equal access to the benefits of broader clean energy deployment;
 - Permitting,
 - Interconnection/grid access; and
 - Lack of consistent, long-term and sustainable regional market design

Therefore, while the IRA will transform and accelerate a clean energy transition in Rhode Island and the Northeast in countless ways, it also has the potential to exacerbate some of the same constraints to longer-term clean energy growth in Rhode Island and in the region.

Jim Kennerly

☎ **508-665-5862**

✉ jkennerly@seadvantage.com

Toby Armstrong

☎ **781-219-7299**

✉ tarmstrong@seadvantage.com

