

Renewable Energy Certificates and their Markets

Prepared for the VT DPS, as part of its

Comprehensive Review of VT's Renewable & Clean Electricity Policies and Programs

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Purpose & Scope

- Purpose:
 - To discuss how energy portfolio characteristics are substantiated and verified.
- Scope:
 - Included in today's conversation:
 - What are we trying to accomplish?
 - What role do RECs play and what are the alternatives?
 - What is a Renewable Energy Certificate (REC)?
 - How do RECs "work?" (How are RECs transacted?)
 - Regional and National REC markets
 - Implications for VT
 - Not included in today's conversation: Discussion of...
 - RES Policy Targets
 - RES Policy Design

What are we trying to accomplish?

1. Verify compliance with public policy mandates and progress toward public policy objectives
 - Renewable energy, clean energy, GHG, or other...
2. Substantiate corporate, institutional, and other *voluntary* renewable energy, clean energy, GHG, or other claims.

How do we accomplish these objectives?

- By reliably describing, counting, and allocating the attributes (i.e., descriptive characteristics) of every MWh on the system
 - Renewable and non-renewable
- Energy and attributes are *created* together, and they can be sold either together or separately.
- **What are our options?**
 - Bundled: purchase energy and attributes together (common historically)
 - Unbundled: purchase energy and attributes separately
- In either case, *every* MWh of energy:
 - Is settled to a retail load-serving entity (LSE)
 - Is assigned a certificate
- Bottom Line: This discussion applies to every MWh on the system; and this is a 1:1 game of musical chairs.

What is a REC?

- Taxonomy:
 - Renewable Energy Certificate (as referred to in the NEPOOL Generation Information System)
 - Renewable Energy Credit (the more general vernacular)
 - Describing and verifying energy characteristics
- Definition: a tradable certificate, representing:
 - 1 MWh from a specific electric generator
 - Carries with it the descriptive characteristics of that generator
 - E.g., fuel type, location, and actual emissions
 - Specifies eligibility for RES/RPS programs (and can be settled only once)
- Affords buyer the unique claim to the descriptive characteristics above
- RECs do not inherently include the secondary or indirect benefits or impacts of the generation which they represent
 - e.g., displaced emissions

How to RECs “work?” (How are RECs transacted?)

- **Contracts** = Bilateral market
 - Price and volume negotiated by parties
- **Transfers** = via NEPOOL Generation Information System (GIS)
 - Creates an electronic ‘certificate’ for each MWh produced (renewable or non)
 - Each LSE (e.g., utility) has an account. At the end of each (trading) year:
 - Energy MWh must = certificate MWh
 - Strategic Approaches
 - Active: LSE purchases attributes (for some, or all, of load)
 - Passive: LSE is assigned a share of attributes *left over* at the end of the year (residual mix)
 - In all cases, this is a 1:1 game of musical chairs.
 - Buyers and sellers may transact energy and/or attributes as much or as little as they like throughout the trading year. **The only accounting that matters is what attributes the LSE (i.e., utility in VT) retains and retires at year-end.**
 - “Retirement” = The act of permanently retaining a certificate, and associating it with load served
 - If you enter bundled contracts, you still need to go through these steps in the NEPOOL GIS
- [Banking: RES programs typically allow over-compliance in one year to be counted toward compliance in the next year.]



Regional and National REC markets

- For RPS compliance
 - Eligibility criteria vary by state
 - Pricing
 - Near-term: based on supply/demand balance
 - Long-term: based on expectation of supply/demand balance and cost of new entry (for RES tiers that require new generation)
 - Both subject to 'Alternative Compliance Payments' which act as price caps
 - REC must originate within ISO-NE, or be delivered into ISO-NE w/corresponding energy (must be unit-specific and delivered to a counterparty in ISO-NE)
- For voluntary claims
 - Buyers define criteria based on subjective preferences
 - Pricing based on willingness to pay
 - Not limited by geographic boundaries

Implications for VT

- Goal = demonstrate compliance with RES
 - Either by attributes or alternative compliance payments
- RES-obligated entities may choose to purchase energy + NEPOOL GIS certificates (i.e., RECs) either together or separately
 - When generation is owned, the (VT) utility may elect to retain or sell the REC. The only accounting that matters is what attributes the utility elects to retain and retire at the end of the year.
- Certificates associated with all transactions (whether bundled or unbundled) settle in the NEPOOL GIS.
- NEPOOL GIS Certificates (RECs) are a mechanism to increase flexibility and liquidity while reducing transaction cost and ensuring that attributes are never double-counted.



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