



**Minnesota Solar Energy
Procurement Workshop
Minneapolis | September 18, 2019**

Renewable Energy Certificates 101

Market Instruments and Claims

What is a Renewable Energy Certificate?

- A renewable energy certificate is a market-based instrument that represents and conveys the property rights to the environmental, social and other non-power attributes of renewable electricity generation
- RECs represent the environmental attributes of one megawatt-hour (MWh) of electricity generation
- RECs are tradeable and serve to substantiate both compliance and voluntary market claims
- RECs are tracked, transacted and retired in one of the various US tracking systems
- Common REC data attributes:
 - Certificate Data
 - Certificate type
 - Tracking system ID
 - Renewable fuel type
 - Renewable facility location
 - Nameplate capacity of project
 - Project name
 - Project vintage (build date)
 - Certificate (generation) vintage
 - Certificate unique identification number
 - Utility to which project is interconnected
 - Eligibility for certification or RPS
 - Emissions rate of the renewable resource

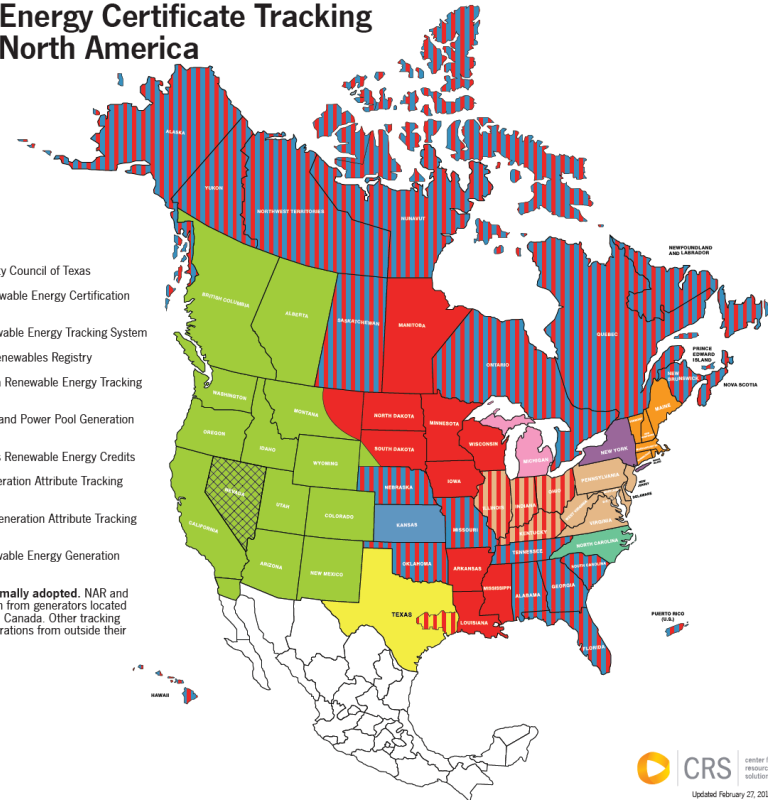
Energy Attribute Tracking Systems

- Tracking systems cover the entire US market, Canada and parts of Mexico
- Energy attribute tracking systems are different from grid operators
- Tracking systems originated to track compliance to state RPS
- Tracking systems are now used to support verification and ownership of voluntary renewable generation and use
- Tracking systems offer the capability to retire market instruments after they are claimed or used by a consumer

Renewable Energy Certificate Tracking Systems in North America

KEY

- ERCOT: Electric Reliability Council of Texas
- MIRECS: Michigan Renewable Energy Certification System
- M-RETS: Midwest Renewable Energy Tracking System
- NAR: North American Renewables Registry
- NC-RETS: North Carolina Renewable Energy Tracking System
- NEPOOL-GIS: New England Power Pool Generation Information System
- NVTREC: Nevada Tracks Renewable Energy Credits
- NYGATS: New York Generation Attribute Tracking System
- PJM-GATS: PJM EIS's Generation Attribute Tracking System
- WREGIS: Western Renewable Energy Generation Information System
- No tracking system formally adopted. NAR and M-RETS allow registration from generators located anywhere in the U.S. and Canada. Other tracking systems may allow registrations from outside their geographic territory.



Renewable Energy Certificates

- RECs are the only instrument through which renewable electricity generation and use can be substantiated
 - Physical electricity says nothing of its origin, source or the environmental impact related to its generation
 - Electricity from a RE project without the RECs is not renewable electricity (U.S. FTC)
 - RECs convey the renewable electricity attributes; the underlying power does not
- RECs are the only mechanism available to:
 - Demonstrate compliance with state Renewable Portfolio Standards (RPS)
 - Demonstrate voluntary renewable electricity use that is incremental to state RPS requirements
- Note: RECs may be used for RPS or voluntary purposes, but not both
 - Avoiding double-counting and –claims of environmental attributes are a key requirement of the market whether used for compliance or voluntary claims

Impact and Claims

- Avoid double counting and claims
 - If two parties count/claim to be using the same renewable energy then only half of the impact will be achieved
- You can either sell or keep your RECs: know the tradeoffs
- REC ownership ensures that your investment isn't counted towards or helps subsidize compliance to a state mandate; that your use goes above and beyond what is otherwise available or required by law
- RECs make electricity green; Electricity absent RECs is not renewable
- The Federal Trade Commission provides guidance on electricity claims
 - FTC Green Guides: <https://www.ftc.gov/sites/default/files/attachments/press-releases/ftc-issues-revised-green-guides/greenguides.pdf>
- EPA's Green Power Partnership offers guidance on making environmental claims and for claims specific to solar projects
 - <https://www.epa.gov/greenpower/making-environmental-claims>
 - <https://www.epa.gov/greenpower/solar-power-use-claims>

MN Renewable Portfolio Standard

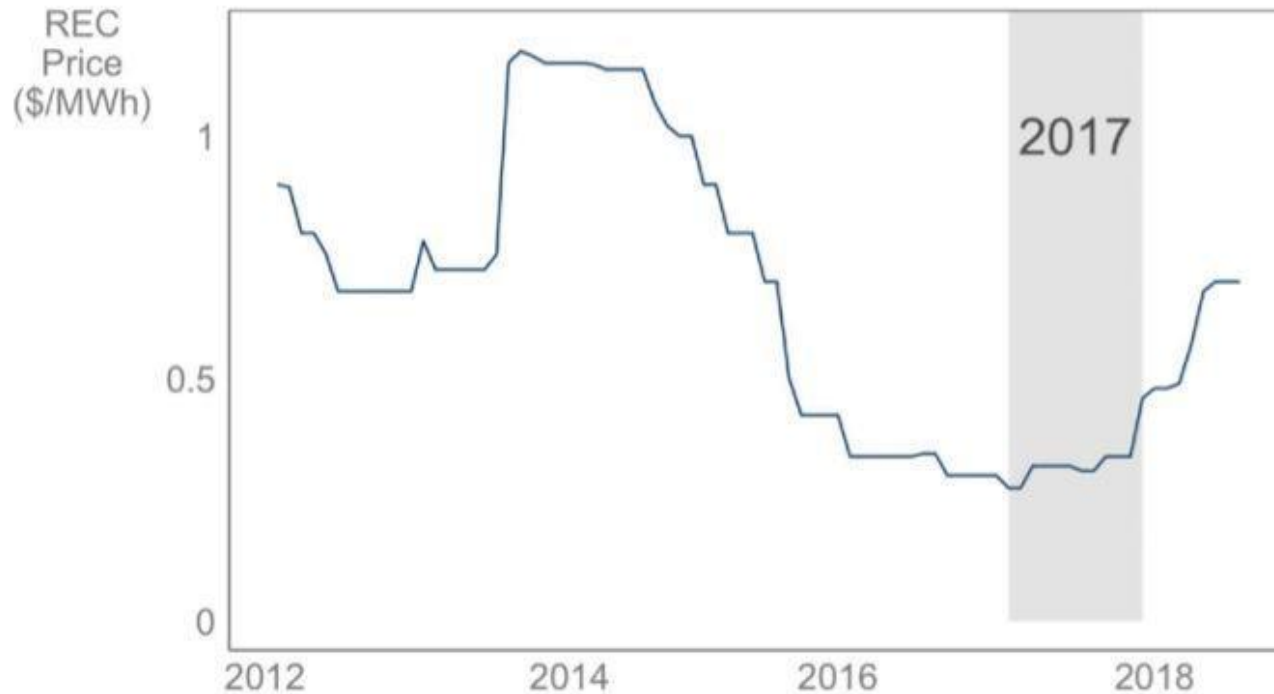
	Standard for Nuclear Utilities (Xcel Energy)	Standard for Other Public Utilities	Standard for Non-Public Utilities
RPS Standard	15% by 2010 18% by 2012 25% by 2016 30% + 1.5% solar by 2020	12% by 2012 17% by 2016 20% + 1.5% solar by 2020 25% + 1.5% solar by 2025	12% by 2012 17% by 2016 20% by 2020 25% by 2025
Other Notes	<ul style="list-style-type: none"> • Only RECs produced after May 24, 2013 but before 2020 are eligible • RECs have a 4-year eligibility life from the month in which they are generated • In addition to the above solar carve-out, Xcel Energy is required to have at least 25% of retail electricity sales generated by wind energy or solar energy systems by 2020, with solar limited to no more than 1% of this additional requirement. • The Minnesota Public Utilities Commission (PUC) approved the Midwest Renewable Energy Tracking System (M-RETS) for tracking RECs and required all utilities to register renewable generation assets by March 1, 2008. • If a utility fails to comply, the PUC may impose a financial penalty on the utility in an amount not to exceed the estimated cost of achieving compliance. The penalty may not exceed the lesser of the cost of constructing facilities or purchasing credits, and proceeds must be deposited into a special account reserved for energy and conservation improvements. 		

MN Compliance Market REC Value

REC Program	Eligible Utilities	REC Price	Term / REC Ownership	System Size Limits
Xcel Energy's Solar*Rewards program	Northern States Power Co - Minnesota	\$0.08 per kWh produced from the PV system over 10 years.	All RECs or similar green attributes are conveyed to Xcel Energy for the ten-year term of the contract.	The system size must be from 0.50 kW to 20.00 kW, not to exceed 120% of the customer's on-site annual energy consumption
MN Dept. COMM; Made in Minnesota Solar Energy Production Incentive	Interstate Power and Light Co.; Minnesota Power Inc.; Otter Tail Power Co	The incentive has a minimum of 0.15 \$/kWh (10 years); Dependent on Manufacturer; <ul style="list-style-type: none"> Some Silicon Energy Voyageur Modules = \$0.25/kWh Some tenKsolar Modules = \$0.15/kWh Some Heliene Modules = \$0.15/kWh Some itek Energy Modules = \$0.20/kWh 	10-Year Contract; Utility owns RECs for 10 years, after which they belong to the system owner	Systems must be less than 40 kW-DC for non-residential systems


National Voluntary REC Value

National voluntary REC prices fluctuate around \$1/MWh



Above graphic is based on wholesale, national, voluntary wind REC pricing. Solar REC pricing may be higher based on several factors (i.e., supply vs demand).

REC Arbitrage

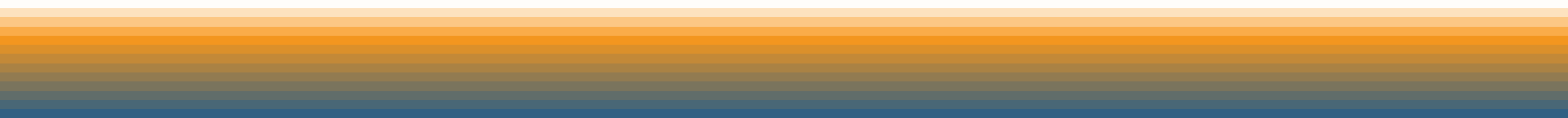
 ar·bi·trage
/ˈərbəˌtræʒH/

noun

the simultaneous buying and selling of securities, currency, or commodities in different markets or in derivative forms in order to take advantage of differing prices for the same asset.
"profitable arbitrage opportunities"

- Due to geographical eligibility differences compliance and voluntary markets consumers can buy and sell RECs at different prices for the same market instrument
- The revenue from the sale of your solar REC can be used to purchase a replacement REC to preserve your exclusive claim to using renewable electricity
- Your claims shift from the original solar REC/resource to the replacement REC/resource

Key Takeaways

- RECs are what you need in order to substantiate a renewable electricity use claim
 - RECs are used to reduce the emissions associated with your purchased electricity use
 - RECs have monetary and environmental value; recognize the tradeoffs of taking one for the other
 - Consider REC arbitrage as a strategy to achieve your goals
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Questions?

Resources

- **Guide to Purchasing Green Power:** <https://www.epa.gov/greenpower/guide-purchasing-green-power>
- **What is a Renewable Energy Certificate?:** <https://www.epa.gov/greenpower/renewable-energy-certificates-recs>
- **Video: How do RECs work?:** http://www.youtube.com/watch?v=_12VYXms6-c
- **Renewable Electricity: How do you know you are using it?**
<http://www.nrel.gov/docs/fy15osti/64558.pdf>
- **WRI Describing Purchaser Impact in Voluntary Renewable Energy Markets:**
<https://www.epa.gov/greenpower/wri-report-describing-purchaser-impact-us-voluntary-renewable-energy-markets>
- **Legal Basis of RECs:** <http://resource-solutions.org/site/wp-content/uploads/2015/07/The-Legal-Basis-for-RECs.pdf>
- **What is REC Arbitrage:** <https://www.epa.gov/sites/production/files/2017-09/documents/gpp-rec-arbitrage.pdf>
- **What is the difference between RECs and Offsets?:** <https://www.epa.gov/greenpower/offsets-and-recs-whats-difference>
- **Greenhouse Gas Inventory Guidance – Reducing your emissions from purchased electricity**
 - <https://www.epa.gov/climateleadership/center-corporate-climate-leadership-indirect-emissions-purchased-electricity>
 - https://ghgprotocol.org/scope_2_guidance