



DEPARTMENT OF PUBLIC WORKS

Environmental Sustainability Division

m e m o r a n d u m

TO: Urbana Sustainability Advisory Commission
FROM: Scott R. Tess, Environmental Sustainability Manager
DATE: February 4, 2014
SUBJECT: **Annotated Bibliography Addressing Functioning and Efficacy Renewable Energy Credits**

Bird, Lori and David Hurlbut, Pearl Donohoo, Karlynn Cory, and Claire Kreycik. "An Examination of the Regional Supply and Demand Balance for Renewable Electricity in the United States through 2015." National Renewable Energy Laboratory. NREL/TP-6A2-45041. June 2010.

This report discusses market expectations for RECs. The authors expect the market demand for RECs to continue to grow through 2015. The demand for renewable energy from renewable portfolio standards is expected to grow faster than the demand for RECs from voluntary markets.

Heeter, Jenny and Philip Armstrong, Lori Bird. "Market Brief: Status of the Voluntary Renewable Energy Certificate Market (2011 Data)." National Renewable Energy Laboratory. NREL/TP-6A20-56128. September 2012.

This report records a 90% increase in reported REC purchases, but attributes much of this growth to better reporting and tracking. EPA data shows an increase of 22% in REC purchases. EPA data is primarily corporate and government reporting. Green-e Certified RECs grew 21%.

The US Energy Information Agency summary of 20 programs that report REC purchases saw median growth of 1%.

Holt, Ed and Lori Bird. "Emerging Markets for Renewable Energy Certificates: Opportunities and Challenges." National Renewable Energy Laboratory. NREL/TP-620-37388. January 2005.

This report describes the basics of RECs including marketing, prices, and challenges facing the growth of REC markets. The report notes that "if unbundled RECs are sold to retail customers outside the region in which they are generated, RECs purchasers may not receive regional environmental benefits, although they will receive any global environmental benefits that may occur from reductions in greenhouse gases, for example."

Johnson, Sean D., Moyer, Elisabeth J. "Feasibility of U.S. Renewable Portfolio Standards Under Cost Caps and Case Study for Illinois." Center for Robust Decision Making on Climate and Energy Policy. No. 12/07. April 2012.

This paper discusses the workings of renewable portfolio standards (RPS) in state statutes. RECs are described as a subsidy helping the renewable energy industry achieve RPS targets. The subsidy is described as "cost-capped REC sales + the PTC." PTC stands for the federal production tax credit. The paper goes on to state that the "decreasing REC prices do not reflect the subsidy needed for new builds, though, but instead the condition of oversupply in the REC market."

Pinkel, Dan and Weinrub, Al. "What the Heck is a REC?." Local Clean Energy Alliance. 2013. www.localcleanenergy.org.

This document describes how the environmental attributes of particular types of electricity production can be sold bundled with the actual electricity and unbundled and sold separately from the actual electricity on the voluntary REC market. RECs that are not used as compliance RECs to meet state renewable portfolio standards are traded at a market value on a voluntary REC market. The authors describe REC revenue as part of revenue stream for renewable energy producers including "long-term electricity purchase commitments based on competitive generating costs, income tax credits, government subsidies, [and] rebates." Regarding the efficacy of RECs to induce additional renewable energy installations, the authors state that "while there might be cases where the sale of unbundled RECs does play a decisive financing role, this cannot be determined simply from REC attributes. To be a factor in stimulating renewable generation capacity, voluntary RECs would need to be sold in a manner that provides predictable cash flow, for example through long-term REC purchase contracts (10 – 20 years)."

Stavins, Robert and Richard Schmalensee. Renewable energy standards: less effective, more costly, but politically preferred to cap-and-trade? 1/12/2011. Grist. <http://grist.org/article/2011-01-11-renewable-energy-standards-less-effective-more-costly-but-politi/>

This article highlights that cap and trade as well as a renewable portfolio standard are both market-based solutions, but cap and trade raises the cost of fossil fuel derived energy, a renewable portfolio standard raises the cost on all electricity.

Environmental Value of Purchasing RECs. U.S. E.P.A. 10/18/13

<http://www.epa.gov/greenpower/rec.htm#ftn1>.

EPA regards REC purchasing as a simple way for organizations and institutions to affect the United States' electricity generation mix at a national scale. These voluntary purchases send a demand signal and provide financial support to new projects that are

competing with conventional technologies. Bringing new renewable electricity facilities online will help the electricity sector emit fewer tons of carbon dioxide emissions than it would have if these renewable energy sources had not been operating or built.

EPA works to ensure Partner environmental claims are supported and accurately communicated. EPA does not encourage organizations to claim that their REC purchases alone makes them “carbon neutral,” or that their REC purchase has reduced their direct carbon emissions to the atmosphere. However, organizations can claim that their REC purchases reduce the carbon emissions associated with their purchased electricity, which is often a key contributor to organizations’ carbon footprint. EPA guidance and corporate GHG accounting rules support these claims.

Green Power Markets. U.S. Department of Energy. 10/25/13. < <http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=5>>

The US Department of Energy displays graphs detailing the falling price of RECs. The website distinguishes between compliance RECs and voluntary RECs. Compliance RECs are much more expensive because they usually must be regionally sourced. Voluntary RECs are cheaper because they can be nationally sourced.

“Renewable Energy Certificates, Carbon Offsets, and Carbon Claims.” Center for Resource Solutions. April 9, 2012. v. 1.1.

This publication is from the non-profit organization which developed and administers the Green-e certification program for voluntary RECs. This document explains the similarities and differences between RECs and offsets. RECs are defined as the “social and environmental non-power attributes associated with the generation of 1 MWh of renewable energy.” Carbon offsets are defined as “a quantity of GHG emissions reductions, measured in units (usually metric tons) of carbon dioxide–equivalent (CO₂e), that occur as a result of a discrete project. The emissions reductions from that project can be sold to enable the purchaser/owner to claim those GHG reductions as their own.” A REC allows the purchaser to “show the use of renewable energy” in electricity generation. RECs may not be used to address non-electricity related emissions. RECs relate to greenhouse gas inventories by allowing purchasers to “to show use of low or zero-emitting electricity.”

This publication describes the concept of additionality as ensuring “that the project can affect the level of emissions relative to the status quo.” Renewable energy facilities may be additional, but are not necessarily so. Carbon offsets, unlike RECs, need to demonstrate additionality.

Renewable Energy Credits. July 2008. United States Environmental Protection Agency. 11/8/13. < http://www.epa.gov/greenpower/documents/gpp_basics-recs.pdf>

This document gives a general description of what RECs are and how they work. The document describes how “RECs were created to help convey the attributes of electricity generated from renewable resources to buyers. Analogous to the utility delivering the physical electricity through wires, RECs serve as the means to deliver the environmental and non-power attributes of renewable electricity generation to buyers – separate from the physical electricity.”