



TRC's, Green Tags, Emissions Trading, & Monetization of Environmental Attributes

by Scott Sklar, June 2000

The Stella Group, Ltd. get many questions on tradable renewable energy credits (TRCs), green tags, emissions trading, and monetization of environmental attributes. This memo attempts to briefly address the terms, issues and players.

Regarding the value of TRCs, it depends upon the market. May prices for TRCs from new facilities (i.e., facilities that have become operational since 1998) were the following:

May 2003 Market Prices for New TRCs

US: New England (mandatory driver)

\$24-25/MWh

US: Texas (mandatory driver)

\$12 /MWh

US: PJM (mandatory driver)

\$3-5/MWh

US: WECC (voluntary)

\$1-5/MWh

UK ROCs: (mandatory)

\$69-79/MWh

Dutch Green certificates (voluntary)

\$6-7/MWh

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Swedish Electricity Certificates

\$25/MWh

CDM Carbon Emissions Reductions

\$3.50-\$4.50/ton CO2 equiv/ \$1.70 - \$2.30/MWh (estimated)

(Source: Natsource "Airtrends," May 2003 unless otherwise noted)

As you can see, they range all over the map depending upon the timing and whether for mandatory or voluntary program use (e.g. for a mandatory RPS type program, the end of the true-up period for the last year -- May -- is a time of higher prices). Right now, prices in the carbon market are much lower than in the TRC market. Also note, these are all denoted in MWh - i.e. they are from the system's energy output not capacity.

TRCs from small distributed generation (DG) systems are still in a bit of transition unless they are from a large metered system. An acceptable methodology is needed for measuring output from non-metered systems and non-grid connected systems so that the TRCs from these smaller systems can be aggregated and bundled for commercial sale. Though there are a number of methodologies that have been discussed and used for special purposes, various stakeholder groups are beginning to discuss the pros and cons of these approaches under different circumstances and get agreement on a credible one for use in issuing and verifying small DG/TRCs.

Below I describe green tags, green power, and trading. I have outlined the organizations and explained what they do.

As with stock quotes, green tags and green power values change by region, power source, market and time period. But these RECs will increase over time and there may be better deals depending on how a clean energy installer/developer monitors, maintains, and aggregates the project. State emissions baselines as a way to track and lure clean energy businesses.

As with stock quotes, green tags and green power values change by region, power source, market and time period. So I am hard pressed to determine what a 1 MW installation anywhere may be worth, However, Cantor Fitzgerald outlined some of the more recent REC trading in CA and

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MA. The \$/Mwh ranges from about \$20 to \$40.

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Understanding Green Tags: Green tags are a kind of currency used in the energy trade to represent the environmental and social benefits-the so-called “non-energy attributes” -of renewable generation and efficiency reductions. Green tags provide a way to buy and sell the environmental attributes of renewable generation separately from the electricity generated. This is useful because the availability of the electricity is constrained by the location of the generating facility. But since green tags are a currency, they can easily be traded over hundreds of miles.

Understanding Emission trading: Emission trading occurs when a source of air pollution reduces its emissions and then transfers ownership of the emission reduction to another party. Markets for emission reductions can be created by regulation (the market for sulfur dioxide allowances for example) or voluntarily (the current market for greenhouse gases) From the Energy Information web site, anyone can find the net emissions of SO_x,NO_x and CO₂: http://www.eia.doe.gov/cneaf/electricity/st_profiles.

Green Mountain Power:(<http://www.gmpvt.com/>): Green Mountain Power sells electricity and energy services and products to about one-fourth of Vermont's retail electricity customers. Green Mountain Power: renewable fuels make up the largest energy source for Green Mountain Power. Where they get their fuel from:

Fuel	Percentage
Renewables	41.2
Hydro	37.4
Wood	3.3
Wind	0.5
Nuclear	30.8
Market purchases	23.9
Gas	2.1
Oil	2.0

At the end of 2001, GMP's average rate of electricity delivered was in Vermont was 10.44 cents per kilowatt hour. A green power aggregator and marketer positions itself between the utilities and the consumers. GMP has been able to get a large customer base for renewable energy, especially wind energy. Currently it is marketing its, New Wind Energy product, where customers can buy windpower in blocks at a premium over conventional electricity. The premium currently is \$2.50 per 100kWh of energy. The company is also looking to use the same marketing techniques to sell solar and demand side energy. Web site does not have information as to where CEI buys its energy from.

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Evolution Markets (www.evomarkets.com): On May 14th, Evolution Markets started an internet based bulletin board for Tradable Renewable Certificates (TRC's). The idea for the bulletin board is to assist price discovery by providing an avenue for buyers and sellers to post bids and offers for renewable energy attributes and green power. “The TRC Bulletin Board is hosted on Evolution Markets’ market data website, evo.ID (www.evomarkets.com/evoid). Market participants can register on the site for free and review posted bid and offers for TRCs and ‘green’ power. Information on listed TRCs includes the category of product, region, state, generation source, quantity (MWh), vintage, and price. Users have the ability to sort and filter postings based on their preferred criteria.”

The Center for Resource Solutions (CRS) (<http://www.resource-solutions.org>): CRS is a San Francisco based organization whose mission is to promote clean and efficient energy use, encourage sustainable economic growth, and help preserve the environment for present and future generations.

CRS is working on several initiatives related to green tags or transferable renewable credits (TRC). The two primary activities of CRS in this area are:

1. A national dialogue on harmonizing various types of TRC programs.
2. Establishing criteria for certifying TRC products in retail markets.

CRS now provides Green-e certification for green tags or TRCs. The certification is a result of a year's work by more than hundred organizations and stakeholders from around the US.

Cantor Fitzgerald: The emissions trading and the green tags activity come under the organization's environmental brokerage arm (www.emissionstrading.com). The portal aims to be a market place for buyers and sellers of various environmental credit trading opportunities, such as, emission trading, SO₂ allowances, renewable energy/green tags market, etc. For registered users, the site provides stacked bids and offers, inside markets and recent trades for renewable energy/green tag markets in California, the Northeast, Houston-Galveston, and other areas. Registration is free, only that it involves an elaborate process and it requires the company to approve the registration on a one to one basis based on the information provided. REC generation varies from state to state, as does the type of electricity generation that qualifies as renewable energy. Renewable energy is broadly defined as energy from a source that is consistently renewed, such as solar, wind, and geothermal energy. However, other types of renewable energy generation include methane gas from landfills, fuel cells, hydropower, and biomass.

Cantor Fitzgerald now brings to the REC market complete information on REC bids, offers, and trades. Rather than only showing the inside markets, all stacked bids and offers are posted along with recent trades. To become a registered user and see how Cantor Fitzgerald's is involved in more than 100 environmental credit markets in more than 30 different geographic areas across the country can help you to understand and take full advantage of the REC and emissions trading

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market opportunities. For more information please go to www.emissionstrading.com or 800-228-2955.

Natsource: (www.natsource.com): Natsource is one of the world's leading over-the-counter energy and environmental intermediaries and advisers. The pioneer in energy and environmental brokerage, Natsource is now a global corporation with a diverse set of mission critical services. Information regarding Natsource's activity in the green tags market is limited. The web site says that the company has brokered a number of European trans-boundary green certificate transactions and lists the contact persons in North America and Europe. North America: Michael Intrator at 1 212 232 5305 or mintrator@natsource.com; Europe: Albrecht von Ruffer at 44 20 7827 2942 or avruffer@natsource.com

Trexler Associates: (www.climateservices.com): Trexler Associates works in the area of climate change risk management and in identifying and implementing greenhouse gas emissions reduction and offset strategies. Their web site is silent about their activities in the green tags market.

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