

Anna Giovinetto reviews the US market for renewable energy certificates and highlights the importance of efficient certificate tracking systems

On the track of green certificates

The US market for renewable energy continues to grow. At present, 14 states have renewable portfolio standards (RPS), which typically mandate that retail electricity suppliers obtain a certain percentage of their sales from renewable sources. Four of these allow renewable energy certificates (RECs) to be traded independently of the underlying electricity (see box). REC trading is an important factor in the development of renewable energy markets, not only because it increases market efficiency but also because it creates financial incentives for the development of more renewable generation capacity.

REC trading maximises the potential value of a renewable generation project because it allows the market to allocate the RECs and electricity to the buyers that value them most. For example, the most interested buyer of the RECs may have no need of the underlying electricity. Furthermore, given the immature state of the renewables markets, determining the future value of the RECs can be challenging. The ability to sell the two commodities independently permits greater flexibility in forward contracts.

Active certificate tracking systems

To support the trading of RECs, systems are needed to track and verify their creation and transfer. A well-designed certificate-tracking system can reduce compliance costs and increase liquidity in the market. At present, two regions in the US have certificate tracking systems. Both were developed by APX of California and are called generation information systems (GIS). They act much like the US Environmental Protection Agency's tracking systems for the markets in sulphur dioxide (SO_2) and nitrogen oxides (NOx) allowances. Generators are allocated one certificate for each MWh of electricity produced, and each

certificate has a unique serial number. When a generator sells certificates, it transfers them into the buyer's GIS account with the click of a mouse. At the end of a compliance period, certificates can then be 'retired', and regulators can easily verify compliance.

The first GIS went on-line in Texas in June 2001. The second was implemented in the New England Power Pool (Nepool) in 2002, and covers six states, three of which (Connecticut, Maine and Massachusetts) have an RPS. A key difference between the two systems is that the Texas GIS tracks only the attributes associated with renewable generation, whereas the Nepool system tracks the attributes associated with all generation. The latter therefore supports other types of environmental reporting such as emissions disclosures.

Both the Texas and Nepool systems distribute certificates to generators on a quarterly basis. Under the Texas system, RECs have a life of three years and may be traded any time during that period. In Nepool, the system has four 60-day transfer periods a year, one for each quarter (see table). Although certificates can be sold on a forward basis, certificates from a given quarter may only be transferred during that period and may not be resold for compliance purposes after the close of the transfer period. There is some concern that the restrictions on the life of Nepool certificates creates a disincentive for buyers to enter into long-term forward contracts for certificates.

Tracking systems under consideration

Several other states are evaluating the feasibility of implementing certificate tracking systems, including Wisconsin, California, and New York. Wisconsin is experimenting with a trial tracking system to support its RPS, and California's RPS, which is still being finalised, contains tentative provisions for the use of a certificate tracking system in the future.

New York is in the process of developing an RPS, but a fledgling market for renewable energy attributes has already begun to form. New York is one of several states that have 'environmental disclosure' requirements, under which retail electricity suppliers – known as load serving entities (LSEs) in the North East – must disclose to their customers the fuel source mix and emissions data associated with their generation portfolio.

In the absence of a certificate tracking system, LSEs have two ways of acquiring the environmental attributes associated with a specific generation source: bilateral transactions and 'conversion transactions'. In a bilateral transaction, an LSE purchases both the energy and



Renewable energy certificates: concepts and terminology

When electricity is generated from a renewable source, the environmental attributes can be grouped together to form a separate commodity that can then be traded independently from the underlying electricity. Various terms are used to refer to these attributes including 'renewable energy credits/certificates' (RECs), 'tradable renewable credits/certificates' (TRCs) or simply 'green tags'. Two regions in the US have compliance markets for renewable energy attributes: in Texas, the term 'renewable energy credit' is used, but in the New England Power Pool (Nepool), the term 'certificate' is more common. In the nationwide voluntary market for renewables, TRC is frequently used.

When environmental attributes are traded separately from the electricity, the two products are said to be 'unbundled'. Under some circumstances, it may also be possible to trade the components of the environmental attributes separately – for instance, the 'renewable' benefits and the greenhouse gas benefits.

Texas and Nepool systems – main features

	Texas	Nepool
System in operation since	July 2001	July 2002
Number of states served	One	Six – Connecticut, Rhode Island, Massachusetts, Maine, New Hampshire, Vermont
Number of market participants (not all categories of market participant listed)	24 generators, 53 retail electricity providers, 7 active brokers	95 generators, 37 load-serving entities (LSEs), 4 active brokers
Certificates for	Renewables only	All types of generation, as well as the 'residual mix'
Certificate called	Renewable Energy Credit (REC)	Nepool certificate (further defined as RPS eligible in Connecticut, Maine and Massachusetts)
Information tracked	5 fields, including year and quarter of generation, type of renewable, facility ID and REC serial number	9 fields, including certificate serial number, plant data, name/capacity, fuel type, emissions data, labour data, eligibility for state RPS, eligibility for Green-e
Certificates in generators' accounts	75 days after the quarter ends	95 days after the quarter ends
Transfer periods for certificate sales	<ul style="list-style-type: none"> ■ Counterparties can trade on a forward basis ■ Generators can transfer RECs to a buyer as soon as the RECs are allocated, and the REC may be resold an unlimited number of times during its life ■ Anyone can hold a REC until it expires 	<ul style="list-style-type: none"> ■ Counterparties can trade on a forward basis ■ There are 4 transfer periods a year, one for each quarter ■ At the end of the transfer period, certificates must be transferred from primary accounts to reserve accounts or they will be 'cleared' by the system and assigned to the residual mix ■ Once certificates are in a reserve account, they may not be resold for compliance purposes
'Lifespan' of certificates (a function of the RPS)	3 years (year of generation + 2 years)	Cannot be resold after transfer period closes; Massachusetts allows limited banking for up to 3 years (year of generation + 2 years)
Imports possible	Yes, under certain circumstances, but has not yet been done	Yes, if power is delivered real-time, but has not yet been done
Approximate cost of the system	Information not available to the public	\$2.5 million a year for the first 2 years, then \$1.25 million a year thereafter. (The cost of the system is borne by the LSEs)
Website:	www.texasrenewables.com	www.nepoolgis.com

attributes directly from a renewable energy generator, and the environmental attributes are reflected in the LSE's environmental disclosure statement. An LSE can also purchase energy in the spot market and then arrange a separate transaction, called a conversion transaction, to obtain title to just the environmental attributes associated with a specific generation source. LSEs are using both bilateral and conversion transactions to improve their environmental disclosure statements.

In the PJM (Pennsylvania, New Jersey, Maryland) electricity trading region, only New Jersey has an interim RPS, but a stakeholder working group is exploring the implementation of a certificate-tracking system for the entire region. Under the New Jersey interim RPS, generation located anywhere in the PJM region qualifies, but environmental attributes cannot be unbundled from the energy. In many cases, renewable generators in PJM (and elsewhere) are selling power under long-term agreements, and the inability to unbundle the attributes prevents them from participating in the market for renewables. Furthermore, there is some confusion about the documentation necessary to support LSEs' claims regarding the fulfilment of compliance requirements under the New Jersey interim RPS. A certificate-tracking system would both improve market liquidity and simplify compliance.

Certificates for the voluntary market

Whereas compliance markets are created in response to mandatory purchase requirements under an RPS, there are also voluntary markets for renewables. These are created by decisions taken at the individual or corporate level, and they differ from compliance markets in a number of key respects. Participants in the voluntary markets may be motivated by a desire to make their actions more sustainable

or to demonstrate corporate responsibility and improve public relations. Examples include residential consumers opting for a 'green pricing' programme offered by their local utility, an organisation buying RECs to make a specific event 'emissions free' or 'powered by renewable energy', or a company deciding to purchase a quantity of RECs equivalent to a certain percentage of its electricity consumption.

Voluntary markets may operate in tandem with, or independently of, a compliance programme. For example, Texas has what is widely considered to be the most successful compliance programme in the US and is also home to Austin Energy which sold 250,000MWh of 'green' energy to its customers in 2003, making it the most successful green pricing programme in the country.

Like the compliance markets, voluntary markets also benefit from certificate-tracking and verification systems that support and document the claims made by those buying and selling renewable energy products. Because the voluntary markets, by definition, lack an overarching regulatory system to verify the integrity of transactions, there is a need to guard against uncertainty and inaccurate representations on the part of either buyers or sellers. Of particular concern is the issue of 'double counting', which occurs when more than one party claims ownership of the same MWh of attributes. However, as noted above, only a handful of states are covered by certificate-tracking systems. For would-be market participants located elsewhere, documenting transactions can be challenging and time-consuming.

Looking ahead

The voluntary markets allow for more flexibility than compliance markets, but the need for certificate-tracking and verification systems to support them is equally important. A step in

the right direction is the Green-e programme. Developed by the non-profit Center for Resource Solutions, Green-e standards exist for both tradable renewable certificates as well as bundled renewable energy products.

Entities such as green marketers who wish to transact in Green-e certified products pay an annual fee and submit to an annual audit of their marketing claims and transactions. In exchange, the marketers benefit from increased consumer confidence in, and recognition of, their products. At present, however, there is no certificate tracking system specifically dedicated to supporting the Green-e programme. Another option to support both compliance and voluntary programmes is the creation of a registry of qualified facilities, such as Massachusetts has done for its RPS programme.

Certificate-tracking systems are essential to support REC trading, and the ability to trade RECs independently of the underlying energy is a key factor in the development of strong markets for renewables. As outlined above, certificate-based tracking systems offer the highest level of security and transparency. At a minimum, such tracking systems should create a uniquely identifiable certificate for each MWh and be internet-based with electronic accounts that simplify transactions and compliance, as well as prevent double counting of certificates.

As more states and regions implement RPS, it is anticipated that more certificate-tracking systems will be developed and possibly integrated with the existing systems. Ultimately, a network of systems could span the country and play a role in supporting nationwide trading or even a federal RPS. 

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