

Developing a Framework for Tradable Renewable Certificates

Final Report

Center for Resource Solutions

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I. INTRODUCTION

The objective of this report is to investigate the potential for coordination between existing voluntary and mandatory tracking and verification regimes for tradable renewable certificates (TRC) in the US and to provide recommendations for the development of a national network to track and verify certificates. The Center for Resource Solutions (CRS) believes that the development of a coordinated US network for tracking and verifying TRCs will build consumer confidence, eliminate the potential for double counting of TRCs, and accelerate the market for renewable energy more generally.

This paper is built on a previously completed TRC white paper authored and reviewed collaboratively by a network of organizations. The method for developing this paper was to conduct research on the many tracking and verification issues emerging in the US and International TRC markets. A review of the governance structures and coordination mechanisms for the European TRC market are outlined below. In addition, this paper provides an overview of the US TRC market and existing TRC tracking regimes and those under development or consideration. CRS identified parts of the European governance structures that might be appropriate to the US market and has developed recommendations for a US structure. These recommendations were reviewed by key market participants in a full day meeting in Washington DC in March 2002. Comments received were incorporated into the final recommendations as appropriate. The minutes from this meeting are found in Appendix I.

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II. BACKGROUND

TRCs offer the potential to expand the market for renewables by broadening the availability and scope of green power products to customers. The concept of tradable certificates is based on separating the environmental or green power attribute of renewable generation from the electrical energy. This creates two separate products for sale by the renewable developer or marketer: (1) commodity electricity; and (2) renewable attributes (aka renewable certificates, green certificates, green tags, environmental attributes). A TRC represents the renewable attributes of a single MWh of renewable energy. The renewable attributes may be bought and sold together, separately or combined with system electricity at the point of sale by a developer or power marketer.

Although about one-third of U.S. electricity customers can now choose to purchase green power from their electric utility or from an alternative supplier, the price and quantity of green power offerings varies significantly across the country. Renewables are often disadvantaged because of intermittency, seasonality, and location, i.e., the best resource sites may be located far from potential customers. TRCs overcome these barriers by providing a financial mechanism to bank and transport renewables as the market demands. In short, TRCs create a more fluid and dynamic market for renewable electricity.

Table 1. Active TRCs Marketers in the US

Company Name	Role in US TRCs Market	Retail Product Description
Aquila Inc.	Internet marketer of TRCs to commercial customers only.	100% new wind resources from Gray County Wind farm in Kansas, only available to commercial customers. Green-e certified.*
Automated Power Exchange	TRCs internet broker in California and Midwest; designer of TREC accounting systems for Texas and New England	N/A
Bonneville Environmental Foundation	Marketing TRCs on internet and to businesses directly; TRCs that are sold are established via contracts with generators and are not “formally” issued by an independent body.	T-RECs are sold in increments of 1,000 kWh, with a minimum purchase of 2,000 kWh, from new wind and solar facilities located in the Pacific NW; Also negotiates individual contracts for large customers. This product is Green-e certified.
Community Energy, Inc	Marketer of wind TRCs; TRCs that are sold are established via contracts with generators and are not “formally” issued by an independent body.	Individually negotiated contracts for new wind certificates; wind blocks also available for residential customers on the internet (unspecified quantity- not sure if they are actually selling these or if it is in preparation for the PECO deal). Product is Green-e certified.
Native Energy	Aggregating financing for new wind projects through advance sale of wind capacity; TRCs are established via contracts with generators and are not “formally” issued by an independent body.	0.02025% of a 750 kW wind turbine (0.134 kW of its generating capacity) over a contract period of 25 years. This amount of capacity is expected to generate almost 11,000 kWh of TRC’s. The TRC’s are donated to a non-profit organization for retirement or for use to avoid equivalent CO ₂ emissions.
Navitas Energy	Aggregating financing for new wind projects through advance sale of wind capacity; TRCs are established via contracts with generators and are not “formally” issued by an independent body.	NEW Windwatts™ Certificate program allows virtually any customer to support the development of NEW renewable energy facilities, by purchasing the environmental attributes of 100% wind energy directly – separate from the energy commodity itself.
NatSource	Broker of TRCs; TRCs are brokered such that Natsource matches up buyers and sellers of TRCs but never takes ownership of the TRCs; TRCs may be issued by a governmental issuing body, or may be established via contracts with the generators	Individually brokered deals. Company does not take ownership of TRCs.
PG&E’s National Energy Group	Internet marketer of TRCs from wind facilities owned by the company; The company issues TRC serial numbers for every kWh generated.	TRCs sold in blocks of new wind from NY and CA (future) wind facilities.
Renewable Choice Energy	Internet provider of TRCs from undisclosed location	100% of customer usage; Two products, 100% new wind and mix of new renewables. This product is Green-e certified.
Sun Power Electric	Internet provider of TRCs from solar and landfill gas operations. Effectively issues certificates from their own projects, although they do not use a serial numbering system. Currently only available to businesses in the	2000/kWh of solar and landfill gas blended TRCs. This product is Green-e certified.

Company Name	Role in US TRCs Market	Retail Product Description
	Northeast, check their website.	
Sterling Planet	Internet provider of TRCs; TRCs that are sold are established via contracts with generators and are not “formally” issued by an independent body.	TRCs in a quantity that matches 25%, 50%, 100% of a customer’s usage based on average electricity bill. From various renewable generators across the US. This product is Green-e certified.
Waverly Light and Power	Internet provider of TRCs from self-owned wind generation; TRCs not formally issued by an independent body.	2500kWh of Iowa wind TRCs

* Green-e certification indicates that the product contains only new renewables and meets other product standards established through a collaborative multi-stakeholder process. In addition, Green-e TRC products are independently verified annually.

The market for TRCs is developing rapidly in the US and Europe. There are at least twelve companies currently selling TRCs in the US and several public and private entities that are issuing certificates for renewable generation across the US and tracking a limited subset of TRC transactions. A summary of current TRC market participants is shown in Table 1. TRCs are marketed through the internet, and through individually brokered sales arrangements. They are sold primarily to commercial customers interested in offsetting their fossil generation with renewables, though a residential market may develop as consumers become more educated on the concept of TRCs. In addition, many suppliers see the potential for TRCs to be transferrable to emissions markets as they develop in the US and internationally. The price for TRCs ranges from 1-2.5 cents/kWh.

As this market grows, there is increasingly a need for coordination among parties issuing certificates, trading and selling certificates to uphold the integrity of the TRC market, build consumer confidence and protect TRC marketer participants from liability that could result from double claims. European market participants have formed an Association of Issuing Bodies that fills this role. This paper explores the concept of establishing a similar association in the US. This paper also provides recommendations for facilitating the coordination between existing issuing and tracking systems. It also includes recommendations for establishing issuing and tracking systems for generators that fall outside of existing tracking regime boundaries.

III. SUMMARY OF TRC PROGRAMS IN THE EUROPEAN UNION

The evolution of TRCs in Europe has developed in a different way and for different reasons than in the United States. The TRC market in Europe developed as a way to integrate renewables into wholesale utility markets and as a mechanism to meet and verify renewable policy goals. There has been considerable work accomplished in Europe on developing the technical aspects – rules, protocol and software – for handling trades between and among large players. TRC activities in Europe have been largely instigated and organized by large electric utilities. At the same time, Europe has had little experience with the development of competitive green retail markets and the implementation of TRCs in the context of sales to large numbers of relatively unsophisticated

retail consumers. By contrast, TRC activity in the US has focused on retail green markets, where TRCs act as an instrument to increase liquidity and overcome barriers to wider deployment of renewables on a retail level.

European interest has been driven by concerns over diversification of power generation sources and security of generation supply, the desire to reduce transmission losses, concerns over local air quality and the reduction of CO₂ emissions in line with Kyoto Protocol commitments.¹ The European Commission's directive to promote renewable energy aims to double the share of renewable energy from current levels of 6% to 12%.² To that end, every EU member state is developing or has developed laws to boost the use of renewable energy. Most countries are using feed-in tariffs and renewable obligations, sometimes in conjunction with a TRC tracking program. Domestic TRC tracking systems are unique to the internal situation in each country and have been established for the primary purpose of facilitating national compliance with Kyoto Protocol and national renewable obligations. However, the establishment of these systems has ancillary benefits for countries that plan to liberalize their electricity market. TRCs are highly compatible with the liberalization of electricity markets because the establishment of TRC systems provides a verification mechanism for TRC consumer sales, and helps unite TRC buyers and sellers. Despite the expectation of some that Europe will move toward a single electricity market in the future, not all EU countries are exploring liberalization or TRC systems at this point, primarily because they have opted for other policy measures to try to increase domestic renewable development.

Several important pan-European initiatives are currently underway that are facilitating trade across borders by bringing together private sector players and working through the trade rules.

A. Governmental TRC Regimes in Europe

Most European countries have policies in place to support new renewable development and a renewable electricity market, either on the retail or wholesale side. There is significant controversy over which of these policies is most effective at bringing more new renewables on line at the least cost to EU member countries. This policy and incentive controversy is at the heart of the discussion over whether a coordinated TRC issuing and trading regime in Europe can be accomplished. TRC regimes can facilitate trade by providing a currency that substantiates that an amount of renewable energy has been generated that can then be traded or banked for future use. Proponents of this approach argue that creating a competitive market in certificates will increase the economic efficiency of renewable generation (i.e. produced in least cost areas) that will keep prices as low as possible. Yet differences in domestic TRC trade rules, renewable preferences, and subsidies make this difficult to achieve.

Eight European countries have passed renewable energy obligations into law (these are comparable to RPS mandates in the US). Of these Austria, Denmark, Netherlands, United Kingdom, Italy, and Belgium have TRC systems in place or with start dates imminent. Other

¹ "Europe plans trading in 'greenness'", Environmental Finance, October 2000.

² Directive of the European Parliament and of the Council on the promotion of electricity from renewable energy sources in the internal electricity market, Commission of the European Communities, Brussels, 2000.

countries in Europe that are considering or preparing for TRC systems (tied to pending legislation that supports renewable energy) are Norway and Sweden. Table 2 includes a listing of the key components of national TRC systems in the European Union.

These differences between national TRC systems in Europe greatly affect cross border trade. Only half of the countries that have domestic TRC tracking systems currently allow international trade. Some countries fear that cross-border trade will compromise their national policy interests. The key issues include the effects of international trade on domestic renewable development, effects of international trade on domestic support schemes for renewables, and issues concerning the harmonization of trade rules. The harmonization of trading rules is largely being addressed by the RECS Program described in detail below.

The issue of renewable development is more complex. Countries have different ideas about the types of renewables that should be bolstered by trading. Because renewables are largely geographically dependent, some countries naturally have more hydro, wind, solar or biomass resources. Though one tends to think of renewables as being universally beneficial, they do have significant land and environmental impacts, particularly biomass and hydro resources. Some countries want to encourage a limited subset of renewable generation locally, while other countries want to bolster a broad range of renewables. Unfortunately, the countries that want to encourage a broad range of renewable generation are not necessarily the same countries that have a broad range of renewable resources available for exploitation. Moreover, some countries want to allow trading only for new installations in order to encourage development, while others want to support their local existing renewable industry. Developing an international trading regime that allows flexibility without compromising the effectiveness of laws and regulations in another country is challenging.

Last, the issue of governmental subsidy is politically sensitive for international trade. Governments are wary of neighbors whose renewable producers enjoy a high level of governmental support that would allow them to dump their certificates on the international market at greatly reduced prices. Governmental assistance to renewable power generation is seen as a hidden export subsidy. Some governments fear that the purchase of certificates from outside their country could serve to subsidize the renewable projects in neighboring states, reducing internal investment. Impediments to international trade are a major issue in many different markets. Provisions to avoid such impediments are included in most international trade agreements (e.g. WTO and NAFTA) with the issues fueling debates in courtrooms around the globe including the European Union Court of Justice.

Table 2: Key Components of International TRC Systems

Country	Pertinent Renewable Policy	Key Characteristics of TRC System	International Trade	Lifespan of Certificate	Terms of Banking or Borrowing	Other Comments
Australia	ESP obligation 12.5% by 2010	Started 2001 Mandatory participation for suppliers with obligation Generators calculate own certificate entitlement New renewables	No international trading allowed	Unlimited	Infinite banking allowed	ORER central registry works in conjunctions with private GEM platform
Austria	End-user obligation 3% by 2005	Started 2001 Mandatory participation	No international trading allowed			
Belgium	Flanders: supplier obligation 3% 2004, 5% 2010; Wallonia, 8% 2010	Started 2001 Excluded: MSW Mandatory participation	No trading allowed outside of Belgium-trading restricted to Flanders	2 years	Banking allowed	
Denmark	End user obligation, 20% by 2003, 30% 2010 Certification of Products	Starts 2003 Mandatory participation Excluded: MSW, small biomass, Hydro >10 MW, some existing renewables	International trading expected 2004 but subject to some restrictions	Unlimited	In discussion – Banking allowed, borrowing with a “security deposit”	TRC scheme is frozen because of criticism regarding switching from a feed-in tariff to a TRC trading scheme
Italy	Generator obligation+2% 2002, increasing percent by 2010	Starts 2002 Mandatory participation Excluded: pumped hydro, biomass, some MSW, some existing renewables	International trading allowed if accompanied by electricity import	10 years	No banking borrowing allowed against penalty price	Issuing body sets price cap
Netherlands	Voluntary negotiated quota. Goal of reaching 8.5% 2010, 17% 2020	Started 2001 Voluntary participation Excluded: hydro, some MSW, some biomass	International trading allowed	12 months after issue	No banking and borrowing	Program coupled with fiscal incentive policies
Norway	TGC system under discussion, but no commitments have been made yet					
Sweden	Supplier obligation	Under development- start 2003? Mandatory participation Excluded: Hydro >10 MW, MSW, biomass	International trading expected after 2005	10 years	In discussion	Fines set for non-compliance
United Kingdom	Supplier obligation 5% 2003, 10% 2010 End-user obligation	Started 2001 – 2002 Mandatory participation Excluded: MSW, Hydro >20 MW, some biomass	Foreign certificates accepted subject to restrictions	End of year after year of issue	25% banking only	Price cap

B. European Renewable Electricity Certificate Trading Project (RECerT)

European Commission funded (in part) a major project called RECerT (European Renewable Electricity Certificate Trading Project)³ to increase capacity for TRCs in Europe. This is largely an academic project but can shed some light on how certificate trading markets work. The project is investigating the policy and financial tools that EU members can use to meet renewables targets set by the European Commission. The RECerT project is managed by a team of academic, private, and NGO players from sixteen countries and has hosted a series of international conferences and workshops. The stated objective of RECerT is to ensure that TRC market development is coordinated within the European Union and barriers to TRC trading are minimized through research and information sharing. The project spanned 18 months, from February 2000 to July 2001 and included 27 partners, mostly from the private sector. The RECerT project included a number of market building tasks including:

- Creation of a website to post papers and a results of their project
- Survey of renewable energy policies in the EU and the prospects for TRC market development to support these policies
- An estimation of the potential and future size of a TRC market under various scenarios
- A series of workshops to educate market participants and member government representatives of the nature of TRC markets and their use in meeting renewable energy targets
- A computer aided economic simulation of a TRC market using different policy incentive and tax assumptions
- A cost benefit analysis of TRC trading versus other policy options for supporting renewable energy
- A web-based TRC market trading simulation project

Of these activities, RECerT's main contribution to the knowledge of TRC markets was the economic simulation of a TRC market and a web-based green certificate trade simulation.⁴ The economic model was designed to investigate some specific issues relating to banking, borrowing and penalties that would be used in designing the web-based simulation. One hundred thirty companies and organizations from eighteen countries played out the web-based simulation using an interactive live real-time web platform.⁵ The simulation responded to market conditions and trading and gave participants a sense of how an international TRC exchange could operate. The simulation allowed participants to investigate the risks and benefits of TRC trading and demonstrated how market participants can manage risks and meet RPS obligations through the use of forward contracts in conjunction with spot market trading. The project simulated ten years of market changes through accelerated trading during one month in 2001. It was designed to be educational for participants as well as governments and was successful in meeting its overall goal of increasing understanding of TRC market processes and showing the technical viability of a web-based platform. The relevant findings from this simulation will be discussed below.

³ recert.energyprojects.net

⁴ "The European Renewable Electricity Certificate Trading project Final technical Report" Sept 2001 published by Energy for Sustainable Development Ltd, 2001. Wiltshire, UK

⁵ *ibid*, p.85

RECerT has been working closely with two additional European Commission funded projects: InTraCert, which is researching the interface ability of tradable green certificates with carbon emissions reductions; and *ElGreen*, a computer simulation model. In particular, *ElGreen* has analyzed different policy options, including feed-in tariffs and renewable obligations, as they are applied to European Union member countries and makes recommendations for maximizing the amount of new renewable generation with least public cost.⁶ All the programs above are working towards a universal European network wherein countries agree to reciprocity arrangements, legal forms of certificates, whether the production or purchase of certificates may be supported by government intervention and which forms of renewable energy are eligible.

1. Relevant Findings of RECerT Economic Market Modeling

The first step in designing the web-based TRC market simulation was to run a simplified economic model to establish the most effective design parameters. The economic model went through sixteen different scenarios involving banking and borrowing certificates under different penalty structures. The findings of this simulation are most instructional to governments trying to design policy for their own domestic TRC trading markets. We will not summarize the findings here because they are relevant to the design of tracking systems to meet specific program needs rather than how to design an integrated system to meet many different program needs. However, one finding that is worth noting here is that transparency in the operation of the issuing and tracking system was extremely important both for the smooth operation of the individual country system, and also for the interaction with the larger European market.

2. Relevant Findings of RECerT Web-Based Trading Simulation

Before explaining the simulation's findings, it is important to understand the underlying assumptions that were used to imitate market conditions. First, certificate accounts were established for each participant. Certificates were redeemed automatically at the end of each year according to each account holder's purchase obligation. Although, the simulation simplified market conditions, it still allowed participants to react in real time to market conditions. Almost eight thousand individual trades were executed during the simulation, involving the creation, sale, purchase, and redemption of over 2.3 billion TRCs, each representing one MWh.⁷ Simulation participants were directed to act in one of three roles, generators, traders, and consumers. Participants had policy goals to meet, modeled after real policy initiatives in their respective countries. At the conclusion of the simulation, 103 GW of new renewable capacity had been added to the system. This supports RECerT's conclusion that the establishment of a TRCs system can be a cost effective method of increasing the deployment of renewables, but the design of the system is extremely important,

Generators who were instructed to invest in renewable capacity anywhere in Europe drove the supply side of the market. Their goal was to achieve the highest return on assets possible. Generators were given performance feedback on their investments so they could react and

⁶ "Action Plan for a Green European Market", Huber, Claus, et al, published by European communities, 2001 Vienna Austria p.5.

⁷ RECerT report, p.85.

adjust investments. In addition, generators were given a starting portfolio of assets based on installed capacity in EU countries. The demand side of the simulation was driven by the consumers, which included large industrial customers and retail suppliers who were purchasing TRCs, for example to meet a green pricing mandate or renewable obligation. Consumers were subject to certain policies and rules governing TRC transactions, including renewable obligations, penalties for non-compliance with renewable obligations, limitations on banking TRCs, restrictions on the type and vintage of TRCs. It is important to note that only two types of TRCs were available for trade, generic renewables, and waste-to-energy. Large hydro (over 10MW) was excluded from the simulation. Uncertainty and risk were introduced by periodically modeling the seasonal output fluctuations of small hydro, wind and solar, and by adjusting penalties for non-compliance. The certificates could be sold at any point in the simulation replicating different markets, so trades could involve certificates generated in the past (banked), in the current year (spot market) or the future (forward contracts). The term *banking* refers to banking greater than a year; one year banking is assumed.

The RECerT trade simulation project yielded some interesting results.

Inefficient Trading Market in Early Years

Like any new market, there is a learning curve as market participants, including regulators, learn how to manage risk and uncertainty in the marketplace. A higher number of trades, but a lower volume of certificates, marked early trading which suggested more speculative activity. In addition, the “churn” rate was higher in the early stages of the market, meaning that certificates were changing hands more frequently than necessary to meet compliance goals. This contributed to price volatility in the first two years. As the market developed and became more efficient, the number of trades decreased while the volume of trading increased.

Pricing and Trading Volumes

Except for price volatility in the first few years, prices tended to hover around an equilibrium point consistently throughout the ten-year simulation with one exception. At the end of the simulation, prices crashed as all certificates expired and the books were balanced. This dumping also occurred in the economic simulation model. This may be relevant to US markets as several states are proposing settlements systems which would effectively require all certificates to be accounted for and retired quarterly or annually. In addition, overall price stability lead to higher trading volumes in the current trading year, or the equivalent of a trading in a spot market, as buyers perception of risk was low. Consequently, there was little use of banking and borrowing capabilities, or a need to manage risk through forward buying.

Importance of Market Coordination

The RECerT project concludes that European TRC markets are likely to be fragmented, speculative and unstable if rules do not allow domestic markets to be fully integrated into a larger EU-wide market. This scenario is similar to individual markets being established independently in different parts of the US without the coordination of a national system. It is

predicted that in the EU, participants will hedge risk by operating in as many domestic markets as possible. Ultimately this will make price comparison more difficult and could lead to price instability and higher risk. The RECerT project recommends that the development of a “European TRC Gold Standard” that would essentially establish a highly liquid sub market for TRCs that have the most universally accepted characteristics. Since this type of TRC would have high demand, it could support a robust and transparent market. Niche markets for highly specialized TRCs are not likely to develop quickly as there will naturally be limited supply and demand and few market participants.

C. Renewable Energy Certificate System (RECS)

Renewable Energy Certificate System,⁸ (RECS) is the only international TRC issuing and trading system that is currently operating in Europe on a voluntary basis⁹. RECS is an extra-governmental, self-financed group that was formed in 1999 by power companies from the Netherlands, France, Germany, Denmark, Belgium, Italy and the United Kingdom. RECS was also established to act as a platform for interested parties to collaborate and advocate for the international harmonization of renewable energy certificates trading systems.¹⁰ At the present time, over 157 companies from 19 countries are members of RECS.¹¹

RECS started a two-year trial of international trading in TRCs in January 2000 in order to prove its feasibility and to educate market players about the steps necessary to create a credible market. The RECS “Test Phase” is designed to demonstrate the feasibility of the concept and the technical systems used in the trading mechanism and to give member countries an opportunity to work through harmonization issues. RECS members have agreed to the RECS Basic Commitment, a document that represents a Europe-wide agreed “minimum common set of definitions and criteria for the creation, issue, use as evidence if transfer of ownership and eventually removal from the market of RECS Certificates...”.¹² Commercial and regulatory organizations from thirteen countries are participating RECS Test Phase, including all of Western Europe except Portugal, Luxembourg and Greece. There are also observers from Portugal, New Zealand, Australia, Japan and the United States of America.¹³

1. Governance Structure of RECS

There are currently three governing bodies within RECS: the Presidium, the Trade and User Group (TUG) and the Association of Issuing Bodies (AIB). While the Presidium takes an overview of and directs the activities of RECS as a whole, the TUG addresses issues associated with trade and consumption. The AIB, originally a working group of RECS has the most formalized role. The AIB will be formally established as a not-for-profit Belgian

⁸ (Some confusion arises from the name RECS, which tends to be interchanged with a more generic term for a green certificate trading system. In Europe, it only refers to this particular group. The general term in Europe is tradable green certificates or ‘TGCs.’

⁹ Note that the Dutch governmental scheme permits certificates from other countries to be imported, although it also requires proof of flow of the associated energy.

¹⁰ www.recs.org

¹¹ From email from Phil Moody, General Secretary RECS AIB, April 11, 2002

¹² RECS Basic Commitment, Article 1.

¹³ From email from Phil Moody, General Secretary RECS AIB, April 11, 2002

Royal Assent company after the trial phase is completed. The position of the Presidium and the TUG is currently being reviewed. All three bodies have been extremely important in establishing and launching the RECS program.

The Presidium

The Presidium is a voluntary association with one member elected by each of the participating RECS countries. A European consulting firm manages the administrative functions of the Presidium. The Presidium's main role is to spearhead efforts to harmonize national systems with RECS on a policy level. This is achieved primarily by facilitating discussions with and between national government representatives and environmental non-governmental organizations. Right now, the issue of harmonization is huge because most European nations have policies in place that restrict internationally traded certificates from being used to meet local renewable policy mandates, which are the primary demand-side drivers in European markets. Most countries do not want their national funds or subsidies to be used to meet another country's renewable obligations. In addition, governments do not want a single renewable project to receive a subsidy from more than one country. To prevent this, most governments have restricted the trade in certificates from subsidized facilities. However, since most supply and demand in Europe is being driven by subsidies and renewable mandates, this has greatly restricted the opportunity of the RECS market to develop and grow. Since early 2000, the RECS Governmental subgroup has provided a forum where governments of these different countries can discuss the issues associated with this problem. It should also be noted, that the efforts of the Presidium are being financially supported by the European Commission because of the benefits international RECS trading will have in helping the EU meet Kyoto protocol targets and improve energy security in Europe. Also note that the European Renewables Directive opens the door to the adoption of a TRC scheme at a European level should current legislation not stimulate sufficient new build of renewables plant.

Association of Issuing Bodies

The RECS system is built upon an organization of individual TRC issuers called the Association of Issuing Bodies (AIB). The Issuing Bodies issue TRCs, register ownership, record transactions and ultimately retire TRCs. Each Issuing Body is appointed by market participants in their region. There cannot be more than one Issuing Body in a single geographic region, known as a Domain. In Europe Domains tend to coincide with electricity transportation and distributions systems or geopolitical boundaries, as. By having only one Issuing Body in a geographic region, RECS ensures that one and only one certificate is issued for a given MWh of electricity generated. Issuing Bodies must be financially independent of market participants and may not buy or sell TRCs or have any financial interest in TRC markets. To obtain accreditation as a member of the AIB, each Issuing Body submits its processes and procedures for review of compliance with the rules of the RECS.

Issuing Bodies have three primary functions within RECS and within their Domain: to issue certificates, to record certificate transactions and to remove certificates from the market at the request of consumers; and to verify the renewable nature and operation of local generation units. All Issuing Bodies maintain a database for their Domain, known as a Central Registration Database (CRD), which will record the issuance and retirement of certificates in

their Domain, and the transfer of certificates both within and into or out of their Domain. When a transfer of ownership is requested, the Issuing Body will confirm that the transfer has taken place.

The Issuing Body has the sole responsibility for imports and exports of TRCs into and out of its Domain and the Issuing Body from the receiving or sending Domain will be alerted of any such transfers. Upon export, a certificate is retired from the registry of the exporting Issuing Body. Upon import, a certificate is created in the registry of the importing Issuing Body, with the same certificate number as it had upon issue. When the owner of the certificates wants to “redeem” or retire the certificate, the Issuing Body will so annotate the certificate on their system, and will issue a printed record of this if desired. Retirement may occur to comply with a RPS or other renewable mandate, to satisfy consumer green power sales, to advertise or otherwise make statements about purchasing renewable certificates (e.g. an end-use customer who makes claims about buying renewable electricity).

Issuing Bodies also have the responsibility for inspecting generators periodically as necessary to verify the characteristics of the renewable certificate are correct and that generation is being accurately measured. To sell their TRCs through the RECS system, generators must register with the Issuing Body in their Domain. Registration is strictly voluntary as is participation in the RECS system, however, renewable generators receive value from participation because their TRCs are tracked and verified from cradle to grave.

The Trade and User Group (TUG)

The TUG was formed as an advisory committee of interested energy traders, green power brokers, and exchanges to provide recommendations and feedback to the larger RECS group. In particular, the TUG helped to define the information and conditions needed to perform international trades for the Basic Commitment. The TUG also worked on establishing extra-governmental trading platforms that will serve the needs of market participants wishing to buy and sell certificates. It is important to note that the Issuing Bodies do not track any financial information in their databases, they only record transfers that are made. Therefore trading platforms are expected to develop outside of the RECS system according to market needs.

The Basic Commitment is in final form at this time, but is currently being re-examined following the completion of preparation for international trade and the early days of trading activity. It is expected that the TUG will have a decreasing role in the governance of the AIB as it transitions from the test phase to a permanent operational structure; but will have increasing importance as an influential group within the larger RECS group.

2. Operation of RECS vis à vis Specific Country Operations

RECS is fundamentally an umbrella organization governing an association of independent Issuing Bodies and other market participants that are buying, selling or trading renewable certificates issued by RECS accredited Issuing Bodies. Therefore, the operations of RECS are inextricably linked to the basic operations of the Issuing Bodies. Each Issuing Body is governed by two directives: the Domain Protocol and the Basic Commitment. The Domain Protocol is developed by each individual Issuing Body and contains the operating rules for a

particular geographic domain. The Domain Protocol incorporates country-specific program rules into its operating procedures, for example, how to treat certificates from a subsidized facility, and what types of certificates can be used to satisfy a specific country's renewable obligation. The Issuing Body is either responsible for or is the verification agent determining compliance with government regulations. Therefore the Domain Protocol lays out the rules for how the Issuing Body will operate its specific certificate tracking and issuing system in a country or region.

3. The Basic Commitment

The Basic Commitment is the common thread uniting the operations of the various European Issuing Bodies. The Basic Commitment represents a minimum set of definitions and criteria for the creation, issue, transfer, and retirement of renewable certificates. All RECS Issuing Bodies uphold and enforce the Basic Commitment within their geographic domain. The Basic Commitment governs the following activities of Issuing Bodies: (1) Registering generators, (2) issuing certificates, (3) transferring ownership of certificates, (4) recording information in the Central Registration Database, (5) verifying generation, (6) investigating requests for changes to the Basic Commitment rules, and (7) mediating disputes. It is important to note that although the Basic Commitment defines renewables as "all energy excluding fossil and nuclear fuels," it does not try to rank or establish an environmental hierarchy between different renewable generation and fuel types. Rather, the Basic Commitment is governed by the philosophy that as long as the generator information is adequately recorded on the certificate, buyers can express their preference for different types of renewables with different environmental profiles. The RECS system does not therefore exclude any renewable electricity types, yet is still compatible with renewable energy programs in Europe as it helps to substantiate renewable production, prevent double-counting, and support verification efforts of such programs.

Registering Generators

The Basic Commitment governs the process for registering generators in the RECS system. Generators who wish to register their output with RECS must supply the Issuing Body from their domain with information about their facility, which must include:

- Contact details
- Location
- Metering details
- Possible fuel sources
- Technology
- Installed capacity
- Start up date
- Public support received
- Guarantee of exclusive use of this certification system for each unit of energy
- Engineering diagram showing metering, transformer and auxiliary equipment

Registration is valid for five years.¹⁴ Generators are given an identification number that is used to identify certificates from their facility. Generators may not register an individual plant with more than one Issuing Body, but where a generator has plants in more than one country it may register with the Issuing Bodies in each of those countries.

Issuing Certificates

The Basic Commitment lays out the process for issuing certificates. The Issuing Body is authorized to issue certificates for the net amount of electrical energy generated. The net amount of electrical energy produced is determined by the gross production minus line losses to the busbar and on-site auxiliary use. The Issuing Body must substantiate the amount of generation with data metered according to national standards. The AIB is developing standards for certificates from PV facilities that may be unmetered. The frequency with which meter data is monitored and certificates issued is governed by the Domain Protocol, and as such will vary between regions and countries. When a certificate is issued, it becomes the property of the generator until ownership is transferred. The Basic Commitment requires that the following minimum information be carried on each certificate:

- Unique certificate number
- Issuing Body
- Generator identity
- Born date of certificate, year, month and day
- Type of generation technology/fuel type
- Level of public support (4 categories)
- Installed capacity of generator.

Transfer of Ownership of Certificates

The Basic Commitment indicates the process for transferring ownership of certificates between RECS members and between Domains. The financial transfer of ownership of RECS may be through private bilateral transactions or through a third party broker or exchange. Either way, market trading mechanisms are not governed by the Basic Commitment and the RECS Issuing Body does not provide the trading platform for sales of RECS. It does however, record transfers of ownership, confirm the transaction with both the buyer and seller, and notify any adjacent Issuing Body if the certificate is being transferred into their Domain. In this last case, all certificate information is transferred with the certificate into the new Domain. The Basic Commitment allows any RECS certificate owner to bank its certificates for an unlimited period of time [this has been limited to ten years for the duration of the test phase], unless otherwise restricted by law.

The Basic Commitment also governs the circumstances under which certificates are redeemed or retired from the system. These include, (1) sale to an end-use customer purchasing renewable power, (2) advertisement of environmental performance from renewable electricity, such as when a company claims to be reducing greenhouse gases or claims to be buying renewable electricity, and (3) use of a certificate to meet a policy mandate, such as a tax exemption, a renewable obligation, air quality goal, etc. A redeemed

¹⁴ RECS Basic Commitment, p. 6.
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certificate is removed from the system by the Issuing Body and the owner of the certificate is credited with retiring the certificate. Retail certificate owners may still sell or trade their certificates but those retail transactions are not tracked.

Recording Information in the Central Registration Database

The Central Registration Database (CRD) is the database maintained by each Issuing Body. There is not at the moment a “central” CRD, maintaining all ownership details from all Issuing Bodies. This is expected to be a feature of AIB operations in the future. Issuing Bodies are obligated to record certain information in the CRD for all RECs members to access. This information includes all static information about generators, such as fuel types, technology type, age etc. Per the Basic Commitment, the Issuing Bodies will also record in the CRD the ownership of each certificate; but will only make public the total number of certificates that are issued, retired and exported/imported.

Verification, Audits and Reports

The Basic Commitment outlines the processes for verifying that meter data being submitted is accurate, that the generator registration accurately represents the current condition of the generation facility, and that the Issuing Body is operating within the rules laid out by the Basic Commitment. The Issuing Bodies are also required to supply the AIB with periodic reports on the volume of transactions and general market information.

Investigating Requests for Modifications and Mediating Disputes

The Basic Commitment establishes protocol for investigating requests for modifications to the Basic Commitment and mediating disputes between market participants or Issuing Bodies. In the event that a dispute cannot be resolved between parties, the Issuing Bodies may take the dispute to the AIB for arbitration.¹⁵

4. Experience of RECS Trading to Date

Uniting several unique and nationally tailored certificate trading programs into an international system is highly challenging because it requires a level of standardization that at times conflicts with national policy interests. Even if two countries are open to trading across their borders, differences in their system requirements, definitions, and regulations create difficult issues. The RECS Test Phase was originally intended to have commenced operation in January 2001. However, agreement of the Basic Commitment was delayed until May 2001. Issuing of certificates commenced in July 2001, but to date certificate transfer has been restricted to proving the system, in the absence of an automated link permitting the transfer of certificates between national registries: this link will be in place at the end of April 2002 and transfers are expected to commence the following month. Retirement of certificates commenced during February 2002. So far, over a million 1MWh certificates have been issued, of which a hundred or so have been transferred and nearly 30,000 have been retired.

¹⁵ RECS Basic Commitment, Article 7.4
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The volume of trade is largely driven by the presence of obligatory systems and voluntary schemes. In view of the natural caution of European governments in agreeing to reciprocal relationships for the promotion of renewable energy via certificate systems and in the absence of mature and well-developed voluntary schemes, the anticipated number of transactions is expected to be limited, at least in the early days.

One interesting development is the ability of an Issuing Body to provide services to participants from countries or regions wishing to participate in the market, but which do not have an Issuing Body that has been appointed by government. In one such instance, the generator was located in a country (Ireland) that does not have a governmentally approved Issuing Body. The generator had a buyer for the certificates in another European country (in this case, the Netherlands – whose Issuing Body was appointed by government) but the buyer wanted the protection and third party verification offered by the RECS scheme. So the generator registered with the RECS Issuing Body for the UK (the Green Certificate Company), which then recorded the generation information per the Basic Commitment protocol and issued certificates to that generator and transferred them to the Dutch registry. The Dutch Issuing Body subsequently retired them on behalf of the buyer. Similar arrangements are in place between the German Issuing Body and Spain. This is an interesting precedent because it provides a good model for the US where there are vast areas of the country that are not likely to have an established Issuing Body in the next few years.

Further precedents exist elsewhere in the world. The UK Issuing Body also issues certificates for a renewable generator in Guatemala (using the same procedures as RECS, but for the time being outside of the RECS scheme, which is currently limited to Europe), redeeming these immediately upon issue and passing printed evidence of the retired certificates to a client in Europe. Further such trades are in progress of negotiation.

Each is an example of the success of the fundamental RECS concept, which was designed to accommodate both obligatory and voluntary schemes, and to support certificate transfer both within and between such schemes.

IV. SUMMARY OF TRC PROGRAMS IN THE US

There are several TRC tracking and trading regimes established or under development in the US. All of these have evolved or are being developed to establish compliance with renewable mandates, state disclosure laws or other policy objectives. Unlike the European RECS, some of these systems also serve as a trading platform, although in all cases the financial transactions occur through bilateral contracts. There is the additional need for such systems to serve a verification function of a burgeoning renewable attribute retail market in the US. Currently, there are at least twelve TRC providers that are selling retail customers blocks of TRCs, usually over the Internet (See Table 1). The development of this market is largely driving both the consumer protection and renewable supplier communities to advocate for the development of a national renewable certificate issuing and tracking system.

A. Texas

Texas was the first state to implement a renewable energy certificates trading program. This program, known as the REC Program, is administered by the Electric Reliability Council of Texas (ERCOT), though the Public Utility Commission of Texas (PUCT) has several significant responsibilities in the overall TRC market in Texas. The REC Program started operating in July 2001.

There are two categories of certificates in the Texas REC Program: Renewable Energy Credits (RECs) and REC Offsets.¹⁶ A REC is from a new renewable facility; a REC Offset is from an existing renewable facility.¹⁷ Pursuant to Texas law, only RECs may be traded.

1. Participation in the REC Program

Participation in the REC Program is mandatory only for Competitive Retailers (LSEs) participating in the retail market in Texas. Other renewable generators wishing to participate in the REC Program and REC aggregators, who are aggregating RECs from small-scale renewable generation units, may participate in the ERCOT REC Program. Other parties may also participate in the REC Program, for example, a third party broker that facilitates transactions.

2. Functional Components of REC Program

Creation of RECs and REC Offsets

A Texas REC represents all of the renewable attributes associated with one MWh of production from a certified renewable generator. RECs are allocated to certified REC generators on a quarterly basis by ERCOT based on metered production that is electronically transferred to the database.

Each REC issued contains the following information. This information is coded to form a unique serial number for every REC produced.

- Date generated (quarter/year)
- Type of renewable resource
- Facility ID number (assigned by ERCOT; fixed for life of facility, regardless of changes in ownership)
- REC Number (numbered 1 through the total number of MWh generated by the facility in a quarter)

REC Offsets are awarded to an existing facility based on its ten (10) year historical average of energy output. Offsets may be used in place of a REC to meet a renewable energy requirement only by that entity assigned the offsets and only when they opt to participate in the newly restructured retail market in Texas. REC Offsets can not be bought, traded, sold or retired. The PUCT issues REC Offsets one time and the Offsets are good until the PUCT

¹⁶ A Texas REC is the same thing as a TRC from new renewable facilities in Texas.

¹⁷ New renewable is defined as renewable energy generators placed in service on or after September 1, 1999 or the incremental capacity and associated energy from an existing renewable facility achieved through repowering activities undertaken on or after September 1, 1999.

revokes them or until the generating entity is no longer generating electricity. The REC Offsets are held in the Offset Generator's account until it assigns those Offsets to one of its member cooperatives to use when they opt into retail competition in Texas.

Source of Data

ERCOT receives metering data electronically transferred directly from the generators based on actual measured production on a daily fifteen (15) minute basis. This information is downloaded into the REC software on a monthly basis. Data used for calculations is settlement quality data. If the REC generator or REC Offset generator does not have interval metering, the PUCT is obligated to define a methodology for determining the amount of REC generation or REC Offset generation that has occurred.

To calculate the REC requirement for RPS compliance of each load serving entity, ERCOT requires each load serving entity to provide monthly load information such that ERCOT can calculate the MWh consumed by Texas customers served by the competitive retailer. Although this information is not publicly available, it is being tracked by ERCOT if this information were needed to ensure compatibility between Issuing Bodies in the US.

Generator Registration

REC generators or aggregators must apply to the PUCT for certification to produce or aggregate RECs. Once registered the PUCT notifies ERCOT of the certification and the REC Generator will log on to the www.texasrenewables.com web site and establish their trading account.

REC Offset generators must have applied to the PUCT for certification by July 31, 2001. After a REC Offset generator is certified, a REC Offset recipient can be identified and certified. The REC Offset generator will deposit the REC Offsets into the recipient's account as described above.

Both REC generators and REC Offset generators can be decertified. ERCOT verifies that generation is occurring when metering is available to do so. If metering is not available, it is the obligation of the PUCT to verify production and that the PUCT Substantive Rule 25.173 is being met.

RECs may also be produced by generators that are not located in Texas if, (1) the first metering point for such generation is in Texas and is for Texas use, and (2) all generation metered at the location of injection into the Texas grid comes from that facility. Such generators must also be certified by the PUCT.

Table 3. Summary of Key Characteristics of US Certificate Issuing and Tracking Systems

Name	Geographic Location of Generating Facility(s)	Information Contained on Certificate	Certificate Born on Date	Certificate Retired on Date	Verification Method	Size	Import / Export Mechanism	Life of Certificate	Banking
APX Inc.	Facilities located in WSCC, ECAR, MAIN, NEPOOL	certificate serial number generator name generator address generator installed capacity vintage of plant fuel type certificate born on date (dd/mm/yy) emissions info eligibility for regulatory programs control area (interconnect) labor characteristics	After generation is verified on a monthly or quarterly basis depending on jurisdiction.	Certificate is retired when presented to applicable regulatory body.	Variable depending on regulatory jurisdiction	MWh	N/A	N/A	N/A
Bonneville Environmental Foundation	North West	generator name generator address generator fuel type generator technology certificate born on date (other)	Certificate is created at the moment of generation. However, reported as m/yy due to meter reading. Solar tags may get quarterly readings, or even annual readings.	Certificates are either mailed to customers or retired on their behalf.	meter read data electronically transferred	MWh	N/A	N/A	N/A
Electric Reliability Council of Texas (ERCOT)	Within Texas or serve load only in Texas	generator technology certificate born on date (other)	Certificate is created during the quarter in which the energy is generated	RECs must be redeemed or retired with the Program Administrator of the Texas Renewable Credit Program (ERCOT).	meter read data electronically transferred, Engineering estimate of generator output, Self reporting for those entities not interconnected to the ERCOT electrical grid with metering	MWh	N/A	three compliance periods	until the lifespan of the certificate expires

Name	Geographic Location of Generating Facility(s)	Information Contained on Certificate	Certificate Born on Date	Certificate Retired on Date	Verification Method	Size	Import / Export Mechanism	Life of Certificate	Banking
Native Energy, LLC	South Dakota and eventually all of the US	certificate serial number generator name installed capacity generator fuel type certificate born on date (other) emissions information control area (interconnect)	Native Energy's certificates represent the purchaser's purchase of a stream of T-RECs that will be generated over a future term. The certificate is dated as of the date of its issuance, and the term of delivery of the associated T-RECs is specified on the certificate.	The T-RECs are donated to Clean Air - Cool Planet at the time of purchase, for it, in some circumstances, to retire, and in others, to manage in ways that will keep as much or more CO2 out of the air as retiring the T-RECs would.	meter read data electronically transferred	other	N/A	N/A	N/A
NEPOOL GIS	New England Power Pool	certificate serial # generator name generator address capacity vintage of plant fuel type certificate born on date (mm/yy) emissions info RPS eligibility control area (interconnect) labor characteristics	Quarterly on the 15th day of the calendar quarter that is the second calendar quarter following the quarter of generation	Certificate is retired at the end of each quarter, except those that have been placed in "reserve." Reserved certificates are effectively removed from the system.	meter read data electronically transferred	MWh	Certificates can be exported without electricity when they are sold to an end-use customer. This is done by transferring them to a reserve account and recording the end-use customer information. Renewable certificates that are sold with electricity may be exported to neighboring control regions. The mechanism for recording this is through the transfer of the certificates into an account held by the recipient and removal of the certificates from the residual mix. Imports of electricity will trigger the creation of certificates and the attributes of the power will be recorded with the GIS administrator.	1 quarter	for certificaes placed in reserve account
PG&E National Energy Group / Madison Wind Power LLC	New York: Madison Wind power site	certificate serial # generator name generator address generator fuel type generator technology certificate born on date (dd/mm/yy)	Certificate is created when the electrical energy is measured. The born-on-date will contain the creation date or the date when a certificate is sold to the customer, whichever is later.	Certificates are transferred to the customer when sold. The customer will then determine when the certificate is redeemed or retired based upon its own circumstances.	meter read data electronically transferred	MWh	N/A	N/A	N/A

Name	Geographic Location of Generating Facility(s)	Information Contained on Certificate	Certificate Born on Date	Certificate Retired on Date	Verification Method	Size	Import / Export Mechanism	Life of Certificate	Banking
PG&E National Energy Group / San Geronio Power Company	California: Mountain View site (near Palm Springs)	certificate serial # generator name generator address generator fuel type generator technology certificate born on date (dd/mm/yy)	Certificate is created when the electrical energy is measured. The born-on-date will contain the creation date or the date when a certificate is sold to the customer, whichever is later.	Certificates are transferred to the customer when sold. The customer will then determine when the certificate is redeemed or retired based upon its own circumstances.	meter read data electronically transferred	MWh	N/A	N/A	N/A
Waverly Light and Power	Iowa	certificate serial # certificate born on date (dd/mm/yy) emissions info	Certificate is created when certificate is purchased	each certificate year	meter read data electronically transferred	kWh	N/A	1 year	N/A

Transferring RECs

RECs are easily transferred between account holders through a web-based platform. The act of negotiating the price and other details of the sale or purchase of renewable electricity or RECs alone is negotiated privately through traditional methods. However, the REC transfer does not occur until the initiator or seller requests a transfer on the ERCOT site and it is confirmed by the receiving party. After this occurs, the REC Program will transfer RECs between accounts.

REC Offsets may not be transferred to another account holder.

Retirement of RECs and REC Offsets

RECs are retired from the system under three circumstances, mandatory compliance (e.g. RPS) voluntary retirement (e.g. green power sale), or expiration. The account holder must designate to ERCOT which RECs it wants to retire for the mandatory or voluntary retirement. ERCOT will automatically retire RECs each year that have expired.

REC Offsets are not retired.

Life of RECs and REC Offsets

RECs have a useful life for compliance purposes of three “compliance periods”, or stated differently, the year in which the REC was generated plus two more full years. If a REC is not used to meet a compliance purpose, it will be retired at the end of the first quarter of the fourth year. For example, a REC generated in 2004, can only be used to meet Texas compliance in the years 2004, 2005, and 2006, but it can still be used for all other purposes, such as private TRC sales, until March 31, 2007 when all remaining RECs from 2004 are retired.

REC Offsets are considered valid until the PUCT notifies ERCOT that they are no longer valid.

Verification of Information

ERCOT and the PUCT reserve the right to request supporting documentation to allow verification of generation quantities as needed. Non-metered monthly load and generation data are submitted to ERCOT and that information is stored for historical and verification purposes.

3. Reporting and Public Access to Information

ERCOT is responsible for generating regular reports summarizing the transactions of the REC program. ERCOT publishes a list of REC account holders with contact information to facilitate REC trading and REC generators with associated non-competitive information, such as facility name, REC ID numbers, resource type, location, etc. ERCOT also posts each month the best available total energy sales in MWh of competitive retailers in Texas for the previous month and year to date. Finally, ERCOT posts a table that contains the CO₂, SO₂, NO_x and particulate matter emissions data supplied by the PUCT and based on the Texas

Natural Resources Commission (TNRC) standards on an emissions per MWh or tons of fuel used basis for each energy type.

B. New England

The New England states have been working to develop a regional certificate-based generation accounting and trading system. The system is administered and operated by APX (heretofore referred to as the GIS Administrator). The system is known as the New England Power Pool Generation Information System, or NEPOOL GIS, and was established to account for various attributes of energy transactions in the NEPOOL transmission region for the purposes of verifying compliance with state RPS mandates, emission and power content disclosure statements, and to establish a trading platform to facilitate compliance with these mandates. No financial information is recorded in the GIS database. The system is planned to be operational in May 2002 and trading related to the first quarter of 2002 is expected to begin on July 15, 2002 in accordance with the operating rules developed by NEPOOL.

1. Participation in System

The NEPOOL GIS system accounts for all generation in the NEPOOL central dispatch, including non-renewable generation types. In addition, all load serving entities in New England are required to have accounts in the GIS system, with the exception of any load serving entities that are not required to meet state mandates, for example some electricity co-operatives or municipal providers. This type of power provider as well as market participants located outside of the NEPOOL central dispatch Control Area may voluntarily participate in the GIS system.

2. Functional Components of GIS System

Creation of Certificates

The GIS administrator issues certificates for every MWh of generation in the NEPOOL Control Area or imported into the NEPOOL Control Area, based on the wholesale energy market settlement data received from the System Operator. Certificates are created two calendar quarters after generation has occurred on the 15th day of the quarter. So, for example, all generation occurring in the first quarter of the year, is issued certificates on July 15th. The certificates are numbered; the minimum denomination is one MWh. Once the certificates are created, they are deposited into the generators account, establishing the generator as the original owner of the certificate until it is transferred.

The following information is carried on each certificate:

- Certificate serial number
- Facility name and location
- Fuel type
- Eligibility for regulatory programs in each New England state
- Emissions characteristics for CO, CO₂, Hg, NO_x, PM, PM₁₀, Sox, VOCs
- Vintage of the generating facility
- Generator installed capacity
- Certificate born on date (mm/yy)

- Control area (interconnect)
- Labor characteristics
- Green-e registration number

Source of Data

The GIS database uses monthly financial settlement data from the New England System Operator for generation within New England, and for imports and exports to and from the System. Transfers and other wholesale transactions are recorded in the database by the parties involved as they occur. Retail load obligations are ascertained by the GIS Administrator based on a combination of information from the System Operator and information provided by the load serving entity. Other information about the generating units not accounted for by the System Operator, such as labor characteristics or generation information from non-NEPOOL generators, can be provided to the GIS administrator directly.

Generator Registration

GIS generators and account holders owning generation outside of the NEPOOL Control Area must register the disclosure attributes of each of their generating units with the GIS Administrator. This information is included on the certificate when issued. The generator information is verified by the state regulatory authority.

Retail Sales of Electricity

Retail sales of electricity are recorded in each load-serving entity's account through a mechanism known as a "Certificate Obligation." One Certificate Obligation is assigned for every MWh consumed. The Certificate Obligation can be satisfied by either the direct purchase of specific certificates (for example, renewable certificates purchased from a qualified generator) or can be satisfied with Residual Mix certificates that represent the attributes of the entire system, minus any specific purchases. Direct purchases of certificates are recorded in the GIS database through a transfer of certificates from one account holder to another.

Transfer of Certificates

Certificates may be transferred through a variety of mechanisms. The GIS system will contain a bulletin board function to allow suppliers to show their certificates available to interested buyers. Buyers and sellers can also arrange transfers of certificates through bilateral contracts or private arrangements. However, the purchase of energy out of the system does not include certificates unless they are specifically transferred. Regardless of the exchange process used, all transfers of certificates between accounts is noted in the GIS database and confirmed by the both parties.

Certificates are eligible for transfer from the day they are created (15th day of the quarter) until 15 days before the end of the quarter.

Reserve Certificates

Any NEPOOL GIS participant that sells renewable certificates directly to an end use customer, separate from electricity, may do so by setting the status of such certificates to a reserved state. Renewable certificates that are set aside in reserve must be transferred to a bona fide third party before the end of the trading quarter. At the end of the trading quarter, all reserve certificates will be retired.

Accounting for Imports

All energy imported into the Control Area will be accounted for through the creation of certificates for the amount of energy imported. The imported energy will reflect the generating attributes of the specific generation unit if the generator of the imported energy meets all of the following criteria:

- The imported generation is eligible for one of the New England states' RPS,
- The imported generation is settled in the monthly settlements of the New England System operator,
- The generating unit is registered with GIS Administrator and has provided all relevant data needed for the GIS Administrator to verify the attributes of such imported energy, and,
- The energy is imported from a generating unit in an adjacent control area with transmission rights over the ties to the New England Control Area.
- The generator can verify for the GIS Administrator that such energy generation occurred,
- The generator has certified that the attributes have not been sold, retired or otherwise claimed by another party in another jurisdiction, and
- A NERC tag has been issued.

If the imported energy does not meet these criteria, the certificates for imported energy will be given the attributes of the most recently available overall mix of fuel sources and emissions of the source control area.

The GIS Administrator will notify the adjacent regulatory agencies on a quarterly basis about the creation and retirement of certificates from imported energy.

Accounting for Exports

Energy exported from the New England Control Area will be recorded through a parallel movement of certificates from the GIS account holder's account to the transferee's account. The certificates associated with the exported energy will contain the attributes of the generating facility if essentially the same criteria as imports are met.

Otherwise the exported energy will have the attributes of the residual mix.

Retirement of Certificates

The GIS is organized in quarterly trading periods. At the end of each trading period, all trading is stopped and all certificates generated during that quarter are accounted for and retired. Any certificates that are not held in a retail load serving entity's account are used to

calculate the residual mix. The residual mix is simply the weighted average mix of all unaccounted for certificates (equivalent to the generation occurring in the trading period, minus any generation that has been removed through the direct purchase of certificates). Any retail load serving entity that has a Certificate Obligation that has not already satisfied it with purchased certificates, is assigned residual mix certificates. After this time, all accounts are closed, reports are available, and a new trading period begins.

3. Reporting and Public Access to Information

The GIS administrator will provide account holders and New England regulatory agencies with quarterly and annual reports respectively. In addition, there will be a publicly accessible portion of the GIS website that will contain a directory of all account holders for the reporting period and, for each account holder, the following information:

- Name, address, phone, fax, website and email,
- Total exports in MWh for the four most recent quarterly trading periods,
- Total number of reserve certificate transactions for the four most recent quarterly trading periods,
- An aggregation and/or average of the certificate fields for all certificates created during the reporting period,
- And for GIS generators,
 - Facility ID number,
 - Fuel source(s),
 - Eligibility under state RPSs,
 - Total generation in MWh for the four most recent quarterly trading periods,
- And for retail load serving entities,
 - Total Certificates Obligations (retail sales) for the four most recent quarterly trading periods,
 - Total imports in MWh for the four most recent quarterly trading periods.¹⁸

C. Wisconsin and Arizona

The Wisconsin and Arizona Public Utility Commissions have developed very similar systems to demonstrate compliance with state's RPS requirements. The Commissions issue credits to utilities, not generators, for renewable electricity purchased. The credits can be banked or resold within the state. These two systems could provide a starting point for future certificate tracking systems and also demonstrate an interest by the regulatory bodies in developing a system to verify compliance with state RPS. WI has recently issued an RFP for the development of a certificate-based tracking system to verify compliance with the State RPS.

D. New York and the Mid Atlantic States

Regulators from New York, New Jersey, Pennsylvania, Delaware, District of Columbia and Maryland are currently investigating the costs and benefits of establishing a certificate based tracking system for the NY Independent System Operator (ISO) Control Area and the PJM Control Area respectively. New York State Energy Research and Development Authority

¹⁸ New England Power Pool Generation Information System Operating Rules.
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(NYSERDA) has contracted separately with the Center for Resource Solutions and the Automated Power Exchange to develop a business plan for the exploration and development of a business strategy for establishing a regional environmental attribute certificate accounting and trading system. The purpose of the system would be to facilitate the unique sale and purchase of environmental attributes associated with energy sold and purchased through the NY spot market controlled by the NY ISO and energy transacted between NYISO and neighboring systems. New York is interested in a system that will support or otherwise satisfy private consumer demands for green products, and be in compliance with other energy and environmental policy requirements, particularly NY environmental disclosure. NYSERDA believes there may be value to green power marketing of renewable certificates and that the development of such a system may help increase the deployment of renewables in New York State. The expectation is that there is a need for the creation of a registry or other form of accounting and verification system along with the creation of an exchange for the purpose of trading individual environmental attributes. NYSERDA has earmarked \$500,000 to develop a system if it is deemed necessary. The development of such a system has largely been advocated by New York market participants who presently are constrained by existing state regulations that prohibit the disaggregation of renewable attributes from electrical energy.¹⁹

Market Participants in the PJM Control Area have also formed an advocacy group to identify market needs and educate regulators about the benefits of establishing a certificate tracking and accounting system. Both New Jersey and Pennsylvania have an RPS in place and the District of Columbia is contemplating the development of an RPS. In addition, New Jersey, Maryland, Delaware, and the District of Columbia have environmental disclosure requirements. Regulators are interested in the development of a renewable certificate tracking system to verify compliance with these two policy mandates. However, the primary discussion is over how to pay for such a system and whether the costs of establishing an electronic tracking system is worth the benefits or whether the same verification functions could be achieved at little or no cost to the regulatory bodies. In addition, there is concern over whether or not there is the political will to require mandatory participation in such a system, and if not, if a voluntary system would fulfill the verification function adequately. There appears to be interest by market participants, the system operator, and regulators in investigating this idea further and watching to see how tracking systems in neighboring control areas evolve. A working group called the PJM Generation Attributes Tracking User Group has been working on this issue since early 2001 and continues to meet regularly to present new information and discuss this and other related issues.

E. California and Ohio

The regulatory agencies in both California and Ohio are also investigating the development of such a certificate tracking system. The California Energy Commission (CEC) has developed a voluntary self-reporting system for registering generators of renewable electricity. However, this system was not established to verify claims or track transactions. The CEC relies on a contract-path verification methodology for verifying claims made for Customer Credit Subaccount funds and for the fuel source disclosure label. While these systems have been adequate, they rely heavily on signed attestations and the due diligence of staff to investigate claims, crosscheck resources, and manually search through various forms filed with the CEC. This is not only labor

¹⁹ From NYSERDA Request for Proposals, PON 607-01.
Center for Resource Solutions
May 29, 2002
Updated August 2002

intensive, it does not provide the level of security desired. With the emergence of TRC transactions and other market developments, the CEC is recognizing that existing verification systems may need to be updated to keep up with the level of sophistication of the renewable market.²⁰

The CEC is interested in exploring the development of a certificate tracking system to serve many needs, including the verification of compliance with pending RPS legislation. With the repeal of direct access, there is believed to be pent up demand for renewable power options by consumers that were “dumped” by their green power provider during the state’s electricity crisis in January 2001. The direct sales of renewable certificates is the only way for the majority of California consumers to support renewable electricity. However, this market is highly underdeveloped at the present time. The CEC is interested in ascertaining whether the development of a comprehensive generation attribute tracking system would help establish a liquid market for TRCs and build customer confidence in direct sales of renewable certificates.²¹

The Public Utility Commission of Ohio is also in the early stages of researching how a certificate tracking system might be used to verify compliance with Ohio’s environmental disclosure label. As of March 2002, PUCO staff had conducted a survey to analyze different compliance approaches, including generation certificate tracking. The issues surrounding the development of such a system will be discussed at the Commission level in the future.²²

F. Western States Coordinating Council

Five years ago, the Western States Coordinating Council (WSCC) expressed interest in the development of a tracking and verification system for renewable resources that could meet the needs of the western states. Initially, the California Energy Commission volunteered to assist in the development of this function but for various reasons the WSCC system did not develop. More recently, there has been renewed interest in developing a western generation tracking system to track fuel mix and air emissions for retail electricity providers in the western US. This effort would facilitate the accurate reporting of fuel mixes and emissions required by state electricity disclosure laws. The system currently being contemplated would have four main functions: (1) track sales, annual production and air emissions from generating facilities in the US portion of the Western System Coordinating Council, (2) create a web-based annual reporting methodology for resources assigned or sold to end-use customers located in participating states, (3) track electricity imports to and exports from the WSCC, and (4) calculate net system electricity mixes and emissions profiles for the Northwest, Southwest, California and WSCC.

This effort is still in the research phase; two meetings have been scheduled for Spring 2002 with state representatives to assess the individual needs of each state for such a system, and to review possible tracking systems and methodologies. The Washington Office of Trade and Economic

²⁰ From conversation with Marwan Masri, Drake Johnson, Heather Raitt, Tim Tutt, of the California Energy Commission, Renewable Energy Program, on March 8, 2002.

²¹ Ibid.

²² From correspondence with Stuart Siegfried, Environmental Specialist, Public Utility Commission of Ohio, March 13, 2002.

Development is spearheading this effort.²³ In addition, at a recent summit of the Western Governor's Association in April 2002, the Western Governors Association made a decision to endorse a regional generation tracking system that can serve multiple purposes, including facilitation of a TRC market.

IV. SUMMARY OF THE AUSTRALIAN TRC PROGRAM

To build a renewable certificate market in Australia, a group of market participants banded together to form an electronic platform for trading and management of certificates. In July 2001, an electronic market, called the Green Electricity Market (GEM) began operating. GEM presently functions as a one-stop-shop for its participants to create, transfer and retire renewable certificates and, in the future, other environmental trading instruments, such as emissions credits.²⁴

GEM was established in parallel with the enactment of the Federal Renewable Energy (Electricity) Act 2000, which created a renewable obligation for wholesale purchasers of electricity. The Office of the Renewable Energy Regulator (ORER) was established to implement the policy objectives of the Act, including the establishment of processes to support the issuing and retiring of tradable RECs as spelled out in the Act.

The ORER central registry is the "master" data collection center for all TRC information used to meet the renewable obligation. It is designed to interface with independent market trading platforms, like GEM, which can download/upload their information into the ORER central registry. Currently, GEM is the only such independent trading platform interfacing with the ORER central registry, although in the future, it is possible that other such market trading platforms will be developed.

1. Governance

The ORER is independent of, and functions separately from GEM. The ORER has outsourced the administration and operation of the central registry to an external company.

GEM is governed by a multi-lateral agreement between the participants and any service providers to the market, and has a formally established decision-making structure. GEM participants themselves, through a Governance Board, are responsible for making, changing, and enforcing the rules that govern market operations.

2. Functional Specifications

Creation of Certificates

Unlike in Europe, Australian generators are responsible for calculating their own certificate entitlement, and for creating their own electronic certificates through an Internet-based central certificates registry operated by ORER. GEM participants may also create

²³ From email sent by Elizabeth Klumpp, Senior Policy Specialist at Washington Office of Trade and Economic Development, sent February 28, 2002.

²⁴ From conversation with Sriani Abey Suriya, E3 International on April 3, 2002.

certificates via the GEM platform. There are legislated provisions for (random) inspections and audits, and stiff penalties for fraudulent creation of certificates or providing misleading information.

Certificates are issued in one MWh increments after the electricity has been generated and metered. All certificates can be traced back to the point of origin through serial numbers. The following information is carried on each certificate:

- Generator registration number
- Power station ID code
- Year generated
- Certificate creation date
- Serial number indicating the MWh number

Once created, certificates are bankable with an infinite lifetime within the scope of the Act.

Registration of Generators

Any generator that wishes to participate in certificate creation, must register with the ORER to receive accreditation and a registration number. To meet accreditation requirements, a generator must produce energy from eligible renewable sources as defined in the legislation and supporting regulations. These include criteria for “new,” baselines, and generation source technology.

Transfer of Certificates

Once a generator is registered, they can trade their certificates either through bi-lateral contracts or, if they are GEM participants, on GEM’s electronic trading platform.

GEM presently trades only RECs created under the renewable energy target legislation, but envisages trading other environmental instruments in the future. All trades are confirmed by both parties involved, and certificates move between accounts following execution of trades. Trading sessions are held for only one hour per day because of the small volume of activity. Certificates can be traded independently of the ORER, but all transactions related to renewable energy certificates under the target must be recorded in the ORER central registry. Theoretically, transactions that occur on the GEM system that are not being used to meet the renewable obligation are not necessarily downloaded into the ORER database, though at present time, GEM is only trading TRCs created to meet the renewable obligation.

Retirement of Certificates

Liable parties may surrender their certificates to ORER directly or via GEM. Certificates are only retired at the express desire of the certificate owner. Certificates can be banked indefinitely in accounts held at GEM.

Verification

The ORER oversees the accreditation, verification, and auditing of generators as well as determining compliance with the renewable obligation. The ORER accredits generators and

determines their eligibility to meet the federal renewable obligation. It also validates the certificates created by generators and requires audits of generators' certificate entitlement calculations systems and processes in accordance with the regulations. Some of these activities are outsourced on contract to other parties. In addition, this Office monitors the central certificates registry that tracks ownership at all times.²⁵

V. CHARACTERISTICS OF SUCCESSFUL TRC TRACKING NETWORK

Though the few TRC trading regimes that are running today worldwide have very limited experience, there appears to be several key characteristics that all such systems include as important to a successful TRC tracking network.

A. Adequate Governance, Education and Institutional Support

Developing a sound framework for trade and governance is one of the most important first steps in developing a harmonized network. Establishing agreements for registering generators, issuing certificates, transferring ownership of certificates, sharing information, verifying generation, and mediating disputes can be highly complex and subject to political sensitivities. As demonstrated in the European RECS system, developing trading rules that harmonize existing governmental TRC systems is no small task. Adequate institutional support to bring parties together, facilitate discussion of sensitive issues, and manage conflict resolution is critical to the success of establishing a sound framework for a US network. Providing an effective institutional home for managing this process is important.

B. Effective Network and System Design and Operation

Besides trading rules, the network itself has to be organized to meet the needs of the market and stakeholders, including the different regulatory purposes of governmental participants. As we have seen in US renewable electricity markets, regulatory uncertainty creates risk for new market participants and can act as a barrier to participation. The rules governing the network must effectively link together different Issuing Bodies and allow seamless communication between such bodies. Not all the information contained in an Issuing Bodies' system needs to be available to all participants; On the contrary, most information in the databases operated by the Issuing Bodies will remain confidential. However, there needs to be an ability to transfer some information between systems to prevent double counting or double selling of TRCs.

There are several key functions that each Issuing Bodies' TRC tracking system must satisfy including: (1) retirement of certificates after they have been used to meet government mandates or retail sales, (2) prevention of double counting, double sale or double use, (3) ability to ensure the basic information (e.g. fuel type, emissions profile) and quantity of certificates is verified, (4) ability to meet a variety of regulatory objectives, such as verification of compliance with RPS or desire to increase market potential for renewables; and (4) the ability of the various issuing bodies to communicate between each other in an efficient and secure manner. The individual systems and the network should be easy to use, transparent, flexible, and have low transaction costs.

²⁵ Ibid.

C. Public Acceptance

Public acceptance by market participants, non-governmental organizations (like trade associations and environmental groups) and government is important for the success of a TRC tracking system and consequently a national TRC network. To identify policy objectives and functional requirements of individual systems and to develop appropriate trading rules for trading between systems requires the cooperation of all parties. The development of a network without such cooperation would unavoidably mean the network might not evolve in a way that would satisfy the needs of different potential parties. In addition, lack of confidence in an individual system or the network as a whole, for example by a regulatory body or environmental group, could undermine the potential uses. Public acceptance of the network of systems and the process for developing the network of systems is important for building a strong and diverse coalition of interested parties that have a stake in the success of the project.

D. Secure Intersystem Communications

It is critically important that tracking systems located in different geographic areas be able to electronically communicate with each other in a clear and efficient manner. The information common to tracking system functions should be handled in a consistent manner and the systems and their electronic interface must be secure from outside intrusion or tampering. Public information must be transparent and easily accessible while proprietary information must be secure and unavailable to unauthorized acquisition.

F. Demonstrated Market Need and Demand

The success of a TRC network requires the support of government and the participation of market participants at all levels, including generators, traders, retail suppliers, and end-use customers. Like all markets, a TRC market needs volume in terms of renewable supply and renewable demand, in order to make participation worthwhile. Without the willing support of a range of market participants, the market simply won't have enough activity to sustain interest. As in the example of the RECS system in Europe, government policy that limits cross-border trade of renewable certificates has a crippling effect on the renewable certificate market because it fundamentally limits the number of participants that have a reason to participate in the market. Similarly, the restrictions imposed by the New England system on exports will greatly limit the opportunities for New England generators to sell their renewable certificates outside of their region. This may have the opposite effect from what New England desired by ultimately capping the amount of new renewable generation that is developed in New England and limiting the potential market for New England generators. Policies like the TX RPS that support long-term demand for TRCs help reduce investment risk, drive the supply side of the market and provide a stable environment for market participation.

VII. RECOMMENDATIONS FOR THE DEVELOPMENT OF AN AMERICAN CERTIFICATE TRACKING AND VERIFICATION NETWORK²⁶

Based on stakeholder input, research conducted and organizational experience spearheading similar multi-stakeholder processes, including the Green-e and Green Pricing Accreditation Programs, CRS recommends that a network similar to the European RECS model of a harmonized TRC issuing and trading system be developed for the US. As envisioned, an American Association of Issuing Bodies would be formed to develop inter-regional trade rules, educate market participants, and provide an institutional base for the development of interconnected state and national systems in North America.

A. Overview of the Need for National Coordination

From stakeholder discussions, CRS has identified the five main reasons why a national network of TRC systems is needed.

(1) Build the Market for Renewables: The development of a national network to issue, track and verify TRCs will help to expand the market for renewables, lay a foundation for current and future uses of renewables (e.g. fulfillment of RPS, wholesale and retail sales, renewable certification programs, emissions trading, pollution offsets), will validate renewable certificates as a fungible currency for trade and banking, and will provide a framework to establish property rights of TRCs.

(2) Market Credibility: The organization of the TRC market under an umbrella framework can help to build consumer acceptance of renewables certificates and market credibility by creating a national, closed loop verification system for renewable transactions.

(3) Cost Savings: There are already two regional TRC tracking systems established in the US and several others being contemplated. It is most cost effective to address the issues that will allow communication between existing and future systems now, rather than to try to normalize systems later. In addition, it will be more cost effective to have a few, interconnected larger systems than many small and regionalized systems that serve only one purpose.

(4) Supports State and Federal Renewable Mandates: At both the Federal and State levels, renewable portfolio standards are gaining popularity. All of the regions that are contemplating or have already established a TRC tracking system have done so to verify compliance with RPS or disclosure laws. Establishing a preferred model in advance of any regulatory requirement to do so will create the most benefit for future market development and coherence for market participants.

(5) Communication: The US is at a pivotal point in development of renewable markets. If tracking systems are designed to meet only state or regional needs, we will have lost a huge

²⁶ Initially, the focus will be on North America with emphasis on the US where certificate markets are developing the most rapidly. At the same time, it should be recognized that the incremental cost of designing a system that will accommodate certificate markets throughout the hemisphere is negligible while the value of anticipating this at the start versus the cost of trying to change a system later is significant.

opportunity to create a national currency for renewables. A voluntary effort to develop some common definitions and rules will greatly facilitate the ability for state systems to communicate with one another, thereby minimizing seams issues, facilitating information sharing, and enhancing the role of each regional system in the larger renewable market.

B. Organizational Structure

The structure being recommended for the formation of an integrated network consists of three key elements:

1. American Association of Issuing Bodies (AAIB)

An alliance of TRC Issuing Bodies would be responsible for approving and accepting all Issuing Bodies wishing to issue internationally acceptable TRC certificates in North America.²⁷ The AAIB will lead the effort to develop some basic trade rules and minimum protocols for North America, called the ‘Basic Commitment.’ The Basic Commitment is conceptually oriented with general principles that preserve transferability and accuracy of information. The Basic Commitment does not govern how a specific Issuing Body operates or what mechanism an Issuing Body uses to fulfill the Basic Commitment obligations. CRS envisions the draft Basic Commitment will be discussed and modified through the stakeholder process directed by the AAIB. Ideally, each Issuing Body will incorporate these guidelines and minimum operating procedures into their own system. Some proposed Basic Commitment language modeled after the AIB Basic Commitment developed in Europe is contained in Appendix II of this document. It has been adapted slightly to meet the perceived needs of TRC participants in North America.

2. Issuing Bodies

Issuing Bodies will be established for different regional Domains in North America. A Domain will ideally be defined by geographical boundaries (e.g. state, power pool, country, or region) or other similar delineations such that a renewable generating facility is assigned to one and only one domain. Each Issuing Body will develop its own operating protocol (called the Domain Protocol) consistent with the laws and renewable energy programs in its geographic Domain and will agree to abide by the procedures established for cooperation with other Issuing Bodies outlined in the AAIB Basic Commitment.

Two Types of Issuing Bodies

Under the conceptual model developed by the Center for Resource Solutions, there will be two general types of Issuing Bodies: Issuing Bodies for mandatory programs and Issuing Bodies for voluntary purposes. A single Issuing Body could fill both of these roles. The Issuing Bodies for mandatory programs will most likely have some regulatory designation from the state or region where it is operating. For example, ERCOT and NEPOOL GIS are the defacto Issuing Bodies for TRCs generated within Texas and New England that are used to meet state RPS requirements. An Issuing Body established for voluntary registration of

²⁷ The incremental cost of establishing a framework that serves the needs of the hemisphere is very low. Both Canada and Mexico have already indicated their interest in participating sometime in the near future.

TRCs would also have to follow the guidelines of the Basic Commitment, but would not necessarily be operated by any regulatory authority. For example, a voluntary Issuing Body could be run by a private business, a non-profit, or a system operator. To avoid issuing more than one TRC for a given kWh, CRS is recommending that there only be one Issuing Body with jurisdiction in a particular geographic area, whether it is a mandatory or voluntary Issuing Body.

Responsibilities of an Issuing Body

The chief responsibility of an Issuing Body is to ensure the accurate issuing, tracking, and retiring of TRCs for any given generator and to verify the information supplied by generators. The mechanism for issuing, tracking and retiring TRCs can be developed by the Issuing Body (referred to as the Domain Protocol), however, they will need to meet the standards in the Basic Commitment to ensure compatibility with the larger network.

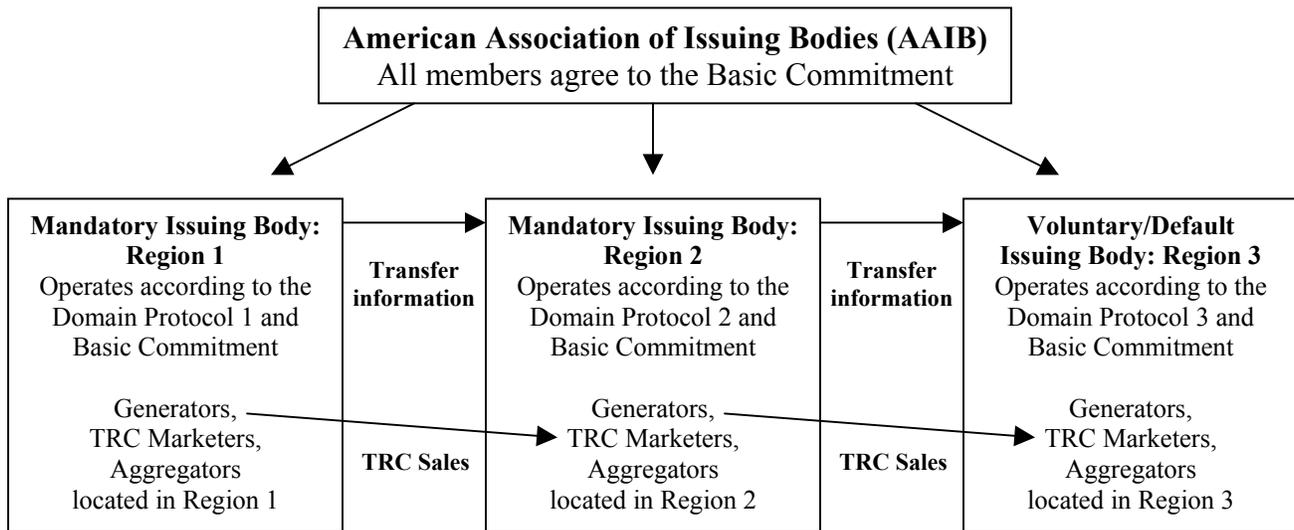
A second responsibility of the Issuing Body is to ensure that information is transferred and shared between Issuing Bodies when necessary and appropriate, for example, when TRCs are sold into a neighboring region with a different Issuing Body. Since there are only two existing systems in place, we anticipate that it will be relatively easy to establish a communication network as new systems are developed. Again, this underscores the importance of having an institutional driver, the AAIB, to work through these coordination issues with stakeholders before many systems are in place and invested in a certain methodology. The goal here is to make sure there is seamless coordination between Issuing Bodies so that a national network of Issuing Bodies is established.

A third responsibility of the Issuing Bodies is to register generators and periodically verify the information provided by generators.

3. Market Participants

The third component of a North American TRC tracking network is market participants, including renewable energy generators, marketers, wholesale purchasers, aggregators, large end-use customers, product certifiers, and traders. These market participants must voluntarily agree to participate in such a system, unless they are located in a region where participation is mandatory, such as New England. Market participants should be involved in the development of the Basic Commitment and the relevant Domain Protocols because of their valuable perspective on the functional requirements of a robust market.

Diagram 1: Organization Structure of a North American TRC Tracking and Verification Network



C. Goals for Establishing an American Association of Issuing Bodies

The primary goals for the formation of the institutional structure recommended above include:

- To develop an agreed-upon framework for addressing immediate US market issues relating to issuing, registering and tracking TRC transactions;
- To develop a legal framework that will establish property rights of TRC owners;
- To meet multiple stakeholder needs including, but not limited to, satisfying verification needs for state regulatory programs or for voluntary programs, such as Green-e;
- To ensure emerging TRC markets get a positive start by providing consumer confidence and credibility, by preventing double sales or other types of certificate abuses;
- To establish an ongoing forum to exchange information and discuss topical TRC issues as they arise and to provide a basis for international cooperation on TRC trading;

The intent is to form a coordinated body that will facilitate the development of a TRC market within various regions of the US, Canada and Mexico. The network should have sufficient flexibility to allow for individual regional and national differences while not compromising the

integrity of individual programs. In addition to facilitating communication among issuing bodies and renewable energy programs within the hemisphere, the proposed network is intended to be compatible with the European system so that global trading and sales can be facilitated in the future as market opportunities present themselves. Finally, an additional goal of this network is to provide appropriate levels of information to allow TRCs to be easily converted into pollution allowance certificates as those markets mature.

D. Recommendations

From the stakeholder feedback received at the CRS hosted meeting in March 2002, from discussions and meetings CRS has attended, and from an assessment of the European program and process as well as the needs for a program here in the United States, we recommend the following:

Recommendation: An American Association of Issuing Bodies (AAIB) should be established as soon as feasible to ensure orderly and consistent development of the TRC market in North America.

There are many opportunities for synergies between this project and activities in the renewable market and energy politics. The Senate Energy Bill contains language for establishing certificate trading as a means of compliance with a national RPS. At the regional level, RTO discussions are still in formative stages in many parts of the country and RTOs may be candidates to act as Issuing Bodies because they will have generation data. The timing of the Federal RPS and the development of RTOs provide good opportunities for building support for an AAIB and national certificate tracking network. This is the most efficient and rapid way of bringing order to the market.

Recommendation: The AAIB operating rules and procedures, as defined in the Basic Commitment, should strive to fulfill the needs of North American regulatory and market participants, as well as be compatible with the European network.

The AAIB Basic Commitment should be developed through a collaborative stakeholder process so that the resulting guidelines will be flexible enough to serve a variety of purposes. This will help attract support, financial and otherwise, to the project.

Since interest in the development of a TRC market has also been expressed by stakeholders in both Canada and Mexico, and given NAFTA and WTO guidelines for establishing a transparent and consistent market approach across borders, the AAIB should anticipate potential activities in these neighboring countries and design the AAIB to accommodate those needs. We believe this broader approach will not require major adjustments in the structure and will be much easier and less controversial to accomplish now rather than wait and try to rationalize two or three different systems later. Similarly, the AAIB should strive for as much consistency as possible with other systems being set up in Europe and others parts of the world. For example, certificates should carry all of the specifications of the European network even if those specifications are not immediately relevant in a North American context. Incorporating these fields now paves the way for international trading later.

Recommendation: The AAIB should develop a default system for issuing and tracking TRCs in regions that do not have an RPS program or appropriate Issuing Body.

Renewable generation facilities are often located in geographic areas where there is no RPS program or any active issuing body. There was consensus at the stakeholder meeting in March that one of the greatest needs is to find or create an Issuing Body to handle TRC transactions that are outside one of the established systems (NEPOOL GIS and ERCOT). There were three possible options that were identified: (1) an independent party, such as APX or a system operator, could conduct this work on a fee-for-service basis, (2) one or more of the existing Issuing Bodies could expand their role and perform this function outside of their established state or region, and/or (3) the AAIB could create or operate a default Issuing Body. If one default Issuing Body is established, it might cede its “territory” to state and regional systems as new systems are created. These three options are not mutually exclusive.

The AAIB could put out a competitive solicitation for ‘default’ Issuing Bodies to fulfill the responsibilities of a voluntary Issuing Body. We recommend that there be no more than one Issuing Body having jurisdiction in a particular geographic area.

Recommendation: The AAIB rules and protocols should strive to be as inclusive as possible.

The AAIB should not attempt to exclude participation by different types of renewable generation resources from the national network. It may be entirely appropriate for individual programs, such as a state RPS or the Green-e Certification Program to set standards for their own programs that indicate eligible renewable technologies. However, the AAIB is primarily an information and tracking network. It should not make implicit value judgments about the relative benefits of different types of renewable generation by excluding specific technologies or fuel types.

Recommendation: The AAIB should conduct more research into the legal issues surrounding a North American market.

The AAIB must be mindful to avoid creating NAFTA issues or triggering NAFTA challenges. For example, there could be a challenge if the AAIB tried to exclude renewable generators or suppliers from Canada or Mexico. There needs to be more research on the legal issues in this area.

Recommendation: The AAIB should strive for the development of a few large Issuing Bodies that can serve multiple functions and cover multi-state territories.

From the stakeholder meeting in March, several market participants identified cost as a chief concern in participating in a voluntary TRC tracking system. In addition, the administrative costs of working with multiple Issuing Bodies for market participants that either buy or sell TRCs across regions could be a barrier to participation. Finally, the development of key documents such as the Basic Commitment will be made easier with fewer Issuing Bodies.

Therefore, it is recommended that the AAIB work to create or facilitate the creation of a few large Issuing Bodies, instead of several smaller ones.

Recommendation: The AAIB must create rules that enable secure and seamless communication between Issuing Bodies.

The security of the individual systems and the ability of Issuing Bodies to accurately record and transfer information is of the utmost importance in establishing credibility of the national network and a national TRC market. Because Issuing Bodies are effectively issuing and recording the transfers of a commodity with monetary value, network security should be of the highest caliber. In addition, the ability of the network to record and transfer information quickly is important to the liquidity of the market.

Recommendation: The AAIB should aggressively reach out to state regulators, Federal institutions, NGOs, and market participants to garner political and financial support for this project.

Two general areas of work need to be conducted to facilitate the formation of an American TRC issuing and tracking network. These can occur simultaneously and in concert with the development of trading rules and an American Association of Issuing Bodies. The first involves education and outreach to market participants, and in particular to regulatory agencies and governmental bodies in the US, Mexico and Canada. The key areas of education needed include:

- General understanding of how the TRC market is evolving,
- What is happening nationally and internationally,
- Why stakeholders would benefit from such a network, and
- How individual governments can play a role.

Second, there needs to be institutional acceptance for moving forward with a process to develop an integrated network. Acceptance for this process involves seeking consensus on the role of the association, the general structure, and goals. Garnering support from national institutions such as the EPA, DOE, Commission for Environmental Cooperation (NAFTA environmental body), Mexico's CONAE, and Canada's ECOlogo, NARUC, as well as environmental groups can greatly facilitate the process.

CRS hosted a meeting in March 2002 to begin the consensus building process. During this meeting there was strong support from environmental groups, market and regulatory participants for moving forward immediately to develop a coordinated national network of TRC Issuing Bodies. In addition, the Western Governor's Association recently recommended the development of a Western States generation attribute tracking system, essentially filling the role of an Issuing Body for the WSCC. Other states including New York, Wisconsin and New Jersey are exploring the idea of setting up state or regional systems. Cumulatively, this represents a strong and diversified coalition of supporters for the recommendations presented here. However, there are many more groups and institutions that are moving forward on TRC related initiatives and are unaware of the work being done to establish a national network. It is critical to get these states and organizations involved before money and time is invested in projects that are not compatible with national level initiatives.

Recommendations for Rules Governing Issuing Bodies

Although the focus of this paper is on the development of a national framework for a TRC market, several recommendations came out of the stakeholder meeting in March 2002 that warrant mention here. These recommendations pertain to the rules governing Issuing Bodies and would most likely be incorporated in the Basic Commitment document.

- Issuing Bodies do not need to quantify emissions offsets or track emissions from a particular facility. However, the Issuing Bodies should have enough generator information carried in the database so that the certificate can be converted for use in current or future emissions markets.
- There has to be coordination and agreements in place to prevent more than one Issuing Body from issuing certificates to a specific generation facility.
- Issuing Bodies should be able to indicate whether or not emissions attributes have been split off from a certificate.
- In the start-up phase, participating Issuing Bodies don't need to have the capability of importing certificates, only the capability of exporting certificates
- Issuing Bodies should be financially independent of the market
- Issuing Bodies should be able to accommodate the following (though these may be implemented in phases): All renewable generation types, small distributed generation, various disclosure systems, various pollutant offset systems, rural off-grid renewables

E. Outstanding Issues and Next Steps

The following is a proposed set of next steps to move this project forward.

1. Phase I: Development of an American Association of Issuing Bodies

Phase I should focus on four keys areas:

Outreach to Stakeholders: This will involve presenting the basic concept of a national TRC tracking network, soliciting feedback and listening for potential seams problems, and keeping groups informed as progress is made. In addition, a web site should be created where information and updates can be posted. This work may initially focus on outreach to US participants, though Mexican and Canadian parties will receive invitations to meetings.

This task is very important for laying the groundwork for the future success of a national TRC network. It will help identify issues that will be important in the design of the Basic Commitment, will foster communication between groups so that related programs and efforts

will be complementary, reduce the opportunity for duplication, and will create grassroots support for the future system.

Establishment of a American Association of Issuing Bodies: An American Association of Issuing Bodies will be formally established by convening stakeholders and developing working groups to design a governance structure, some basic meeting protocol, and processes for making changes to the Basic Commitment. The establishment of an institutional structure to house this effort is important in creating a transparent process for developing and negotiating the agreements under the Basic Commitment.

Development of a Basic Commitment: Using the draft Basic Commitment in Appendix II as a starting point, an acceptable AAIB Basic Commitment must be negotiated by existing Issuing Bodies and other market participants. The creation of a common set of rules that all Issuing Bodies can agree to is important for the transferability of TRCs between national and global markets. It will also provide some guidelines that will facilitate coordination as new markets develop.

Establishment of a Default Issuing Body: The creation of a default Issuing Body was identified as one of the most important next steps in establishing a national network. The default Issuing Body(s) must be able to meet the requirements of the Basic Commitment and issue certificates to renewable energy generators located where no entity presently provides those services.

2. Phase II: Development of an American Network of TRC Issuing Bodies

Building on the work completed in Phase I, the newly established AAIB will need to work on the following issues.

Use of TRCs in Emissions Trading Markets: The transferability of TRCs from the national network into emissions markets as they develop will increase the value and market for renewable certificates. The national network should have this capability and work closely with experts in the field to ensure necessary data are included in the system design.

Refinement of Basic Commitment: As the market progresses there will be a need to refine and add to the Basic Commitment to accommodate some issues that were deferred from Phase I. Some examples of additional issues are: non-grid connected renewables and using deemed values for small-scale renewables.

Incorporation of Mexican and Canadian Issues: Although the tasks above are not exclusive of Mexican or Canadian interests, US issues and interests should be prioritized as the US TRC market is more advanced. Nonetheless, CRS anticipates that both Mexican and Canadian interest in wider North American trading of TRCs will grow as the US market is formalized. The legal and technical issues related to the inclusion of Mexican and Canadian Issuing Bodies to the US network needs to be investigated.

VIII. CONCLUSIONS

The development of a national network for issuing and tracking TRCs is feasible and there is broad-based support the development for such a network. There are already two defacto Issuing Bodies in the US, ERCOT and the NEPOOL GIS. There are several other states and regions that are either contemplating a system, or have already issued an RFQ for a system designer and developer. In addition, there appears to be strong support for the development of a national coordinating body, such as the AAIB, to help facilitate the development of agreements needed to form a national network of Issuing Bodies. Conceptually, there is widespread agreement that the simple model recommended in this paper is logical and will provide the most efficient solution to many different markets and regulatory needs. The chief barrier to the development of such a network appears to be the initial funding to establish the AAIB and the necessary agreements, and to help develop Issuing Bodies in those regions where there might not be a strong regulatory interest in developing a TRC tracking system. Despite this, the strong and diversified coalition of supporters may be able to bring money to this process.

CRS was both surprised and pleased by the strong support these recommendations have received from a diverse coalition of stakeholders. We believe this reflects the fact that stakeholders have already been thinking in these same directions and that the timing is right to move forward on this critical next phase.

APPENDIX I: AGENDA AND MINUTES OF THE MARCH 26, 2002 STAKEHOLDER MEETING

Establishing a North American Association for Issuing and Verifying
Tradable Renewable Certificates

Agenda

March 26, 2002, 9:30AM- 4:00PM

The Aerospace Center, 901 D Street, S.W., Suite 930., Washington DC

- 9:30 – 10:00 Meeting Orientation – Jan Hamrin
Introductions
Overview of Need for National Coordination
Goals of Meeting
- 10:00 – 10:40 Brief Overview of Survey of Existing Systems and TRC markets
European AIB and RECs (Phil Moody)
ERCOT (Michael Rucker)
NEPOOL
Others

Discussion and Brainstorm Sessions

- 10:40 – 11:00 Pros and cons of establishing an American Association of Issuing Bodies
- 11:00 – 12:00 What criteria should be used for the issuing bodies? Should issuing bodies be limited to government or can it include private actors? What separation should be required between issuing bodies and market participants?
- 12:00 – 12:45 Lunch
- 12:45 – 1:30 Who should issue certificates for areas of the country that are not covered by existing tracking regimes? Would a ‘default’ issuing body(s) work as an interim step?
- 1:30 – 2:15 What is the most feasible and practical approach for existing TRC systems interface with developing emissions trading systems?
- 2:15 – 3:00 Review of AAIB Recommendations (detailed version) Identify any outstanding issues.
- 3:00 – 3:30 Discuss ‘Earmarking’ of TRCs and the issue of Public Support. How should we approach this issue? Is a placeholder in the database sufficient until International coordination actually develops? Pros & cons.
- 3:30 – 3:40 Discussion of the Name
- 3:40 - 4:00 Meeting Wrap-Up and Next Steps

Materials prepared in advance:

- Draft Commitment (detailed version)
- AAIB Recommendations
- Map of Potential TRC Domains in the US

Establishing a North American Association for Issuing and Verifying Tradable Renewable Certificates

Meeting Highlights

March 26, 2002, 9:30AM- 4:30PM

The Aerospace Center, 901 D Street, S.W., Suite 930, Washington DC

Attendance

In Person

Jan Hamrin, CRS

Meredith Wingate, CRS

Ryan Wiser, representing CRS

Bob Grace, representing Union of Concerned Scientists

Nicole Fabri, Natsource

Ed Holt, Ed Holt and Assoc.

Kevin Bryan, NWCC

Kurt Johnson, EPA

John Saintcross, NYSERDA

Muir Davis, PG&E National Energy Group

Tom Kerr, EPA

Phil Moody, Campbell Carr- representing the European Association of Issuing Bodies

Michael Rucker, APX

Ashley Houston, APX

Heather Raitt, California Energy Commission

Scott Vaughan, North American Commission for Environmental Cooperation

John Garrison, International Business Council for Sustainable Energy

Alden Hathaway, Environmental Resources Trust

On Phone:

Gerry Kotas, DOE

Gabe Petlin, CRS

Roy McCoy, ERCOT

Deb Malin, BPA

Bunli Yang, Ontario

Rob Harmon, Bonneville Environmental Foundation

Virinder Singh, Pacificorp

Introduction

Jan Hamrin opened the meeting with a brief overview of the need for national coordination of parties issuing and verifying tradable renewable certificates (TRCs) and the benefits of establishing a North American association to facilitate this work. The recommendations sent out in advance of this meeting were based on a model developed in Europe. The European model connects a number of domestic TRC tracking systems into a European network that shares a common set of procedures for ensuring the quality and transferability of the information collected.

NREL/DOE funded CRS to convene this meeting and write a report incorporating stakeholder comments and background on key concepts and feasibility. CRS is currently seeking funding for next steps.

Overview of Need for National Coordination- Jan Hamrin

(1) Build the Market for Renewables: The development of a national network to issue, track and verify TRCs will help to expand the market for renewables, lay a foundation for current and future uses of renewables (e.g. emissions trading, pollution offsets, fulfillment of RPS, wholesale and retail sales), and will validate renewable certificates as a fungible currency for trade and banking.

(2) Market Credibility: The organization of the TRC market under an umbrella framework can help to build consumer acceptance of renewables certificates and market credibility by creating a national, closed loop verification system for renewable transactions.

(3) Cost Savings: There are already two regional TRC tracking systems established in the US and several others being contemplated. It is most cost effective to address the issues that will allow communication between existing and future systems now, rather than to wait until there are numerous systems in place. In addition, it will be more cost effective to have a few, interconnected larger systems than many small and regionalized systems that serve only one purpose.

(4) Supports State and Federal Renewable Mandates: At both the Federal and State levels, renewable portfolio standards are gaining popularity. All of the regions that are contemplating or have already established a TRC tracking system have done so to verify compliance with RPS or disclosure laws. Establishing a preferred model in advance of any regulatory requirement to do so will create the most benefit for future market development and coherence for market participants.

(5) Communication: The US is at a pivotal point in development of renewable markets. If tracking systems are designed to meet only state or regional needs, we will have lost a huge opportunity to create a national currency for renewables. A voluntary effort to develop some common definitions and rules will greatly facilitate the ability for state systems to communicate with one another, thereby minimizing seams issues, facilitating information sharing, and enhancing the role of each regional system in the larger renewable market.

Jan also provided some thoughts on the common characteristics of a national network of TRC issuers and trackers as envisioned by CRS:

- Inclusive of all renewables
- Functionally adequate to serve multiple needs and purposes, i.e. collects enough information to satisfy state, federal and voluntary program needs
- Oriented toward the wholesale market (though, not restricted to tracking only wholesale market transactions)
- Would not try to calculate pollution offsets or pollution credits, but would provide enough information so that others could do so

- Will have a banking function

Goals of Meeting

The goal of this meeting was to answer three key questions:

- (1) Do stakeholders agree that working toward the development of a national network of renewable certificate issuers and verifiers is worth pursuing?
- (2) What, if any, are the major issues that need to be overcome and are there any insurmountable barriers that can be identified now?
- (3) What recommendations can stakeholders provide for moving forward?

Overview of Existing Systems

Phil Moody, General Secretary of the European Association of Issuing Bodies, gave a short talk on the European model, including the governance structure, key functional and operational characteristics, contentious issues, and current program status.

Michael Rucker, Project Manager at APX, gave a brief overview of the key characteristics of the NEPOOL and ERCOT systems.

Both presentations are attached.

Key Discussion Points

The meeting was largely a conversation about various issues related to the feasibility of setting up a North American Association of Issuing Bodies. The group also discussed issues and problems related to the development of regional issuing bodies. Outlined below are the key themes discussed in the meeting.

Opportunities with Current Timing

The Senate Energy Bill contains language for establishing certificate trading as a means of compliance with a national RPS. At the regional level, RTO discussions are still in formative stages in many parts of the country and this is a good time to try to engage RTOs. RTOs are good candidates to act as Issuing Bodies because they have most of the generation data. The timing of the Federal RPS and the development of RTOs provide good opportunities for building support for an AAIB and national certificate tracking network.

Structure of a North American Association of Issuing Bodies (AAIB)

There were questions about the structure and role of the AAIB. The initial recommendation put forth by CRS is for an AAIB that serves as an umbrella organization that performs all of the administrative and organizational functions needed to support a national network of TRC issuers and verifiers, including the development of minimum protocols. The AAIB might be housed at CRS to start, then spun off as its own 501(c)3 once funding was established.

Creating a Default Issuing Body

There was consensus that one of the greatest needs is to find or create an Issuing Body to handle TRC transactions that are outside one of the established systems (NEPOOL GIS and ERCOT).

There were three options that were proposed: (1) an independent party, such as APX or some other company, could conduct this work on a fee-for-service basis, (2) one or more of the existing Issuing Bodies could expand their role and perform this function, and/or (3) the AAIB could facilitate the development of a default Issuing Body. If one default Issuing Body is established, it might cede its “territory” to state and regional systems as they are developed. These three options are not mutually exclusive.

Who Should be the Issuing Bodies?

Although NEPOOL and ERCOT are obvious choices for Issuing Bodies, it is not clear that they will be able to or will want to fill that role. During the development of the NEPOOL GIS, NEPOOL rejected the idea of becoming the Issuing Body for TRC only transactions. Under current rules, NEPOOL has a mechanism for transferring TRCs out of their system, but not for importing TRCs. ERCOT was open to fulfilling this role, though did not know if they will legally be able to do so. The group also suggested that Issuing Bodies don’t necessarily have to be in an exclusive geographic area (e.g. issuing bodies could be organized by technology area), but there does have to be coordination and agreements in place to ensure only one issuing body issues certificates for any specific generation facility. .

Size of Domains

There was discussion around the preferable way to create a national tracking system. There was general consensus that the bigger the “domain” the better. The reason for this is that many large wholesale suppliers work across state and regional boundaries. In addition, it is less expensive to develop a few large systems, than a number of smaller systems, and may be more politically expedient as well. The concept is that there will be 3 to 6 issuing bodies in the United States, one in Canada and one in Mexico. This network will be linked electronically so that information can be easily transferred between issuing bodies as appropriate.

Costs to Market Participants

There was discussion around how much it will cost to develop regional Issuing Bodies and an AAIB, and to participate in a voluntary national network. In Texas, costs of running the ERCOT system are paid through transactions fees. In New England, GIS Load Serving entities are assessed fees on a pro-rated basis based on GIS load. There was general consensus that the margins on TRC transactions are already very small. The development of the AAIB and other voluntary tracking efforts must be low cost to market participants. It will be less expensive to develop one or two large additional Issuing Bodies or to expand existing Issuing Bodies than to develop a bunch of smaller Issuing Bodies.

CRS is currently looking for funding to continue the AAIB process.

Stakeholder Involvement

Throughout the day, there were suggestions made about involving different stakeholders. Suggestions include: NARUC (might be a good in-road into the regulatory community) and RTOs.

Emissions Information

There was general consensus that a national network doesn't have to track or quantify all emissions information or emissions offsets, but needs to have minimum generator specific information so renewable energy certificates can be converted for use in emissions markets. Emission trading markets are based on measurable stack emission reductions; therefore TRCs are not currently transferable because the emissions benefits are indirect in the form of emissions offsets. The best role for the AAIB is to track enough information so that when emissions offset markets are developed, verified TRCs will be available for use.

Separation of Emission Attributes

TX and NEPOOL are silent about the ability of suppliers or generators to split off emissions attributes. If someone did sell off carbon or some other attribute, it wouldn't be recorded in these systems. The group generally felt that the AAIB should aim to have Issuing Bodies either track specific attributes, or verify that no attributes have been separately sold.

Role of AAIB vs. Role of Issuing Bodies

The group discussed whether the AAIB would set standards and determine compliance with RPS laws, or if that would be left to other entities. The proposal put forth by CRS is that the AAIB would only set standards relating to interactions between Issuing Bodies, but would not set product standards or attempt to define "green" power. It is assumed that this network might be used by states or programs like Green-e to verify program compliance, but that responsibility will fall on the individual Issuing Bodies, not the AAIB.

On a related issue, it was noted that some states only allow energy purchased through contract path tracking to be used on disclosure labels. If suppliers are using certificates, marketing claims will be incongruous with disclosure labels in these states. There was general consensus that Issuing Bodies will define a domain compliant TRC (e.g. one eligible for a state RPS, or disclosure etc.) The AAIB can identify the characteristics of a universal TRC that can be used in all markets (highest common denominator).

Type of Generation that is Tracked

There were mixed opinions as to whether the AAIB should aim for a national network that tracks all generation, or one that is focused on renewables. NEPOOL GIS will track all generation. ERCOT tracks all generation, but only draws from REC eligible generation for its RECs program. Some felt that it would be better to set up a network that will accommodate future electricity system needs. Others thought that incorporating non-renewable transactions is unnecessary and could add expense without benefit.

Financial Interest of Issuing Bodies in TRC Market

One question that needs to be resolved in early next steps is whether Issuing Bodies can have any financial stake in certificate trading. Phil noted that in the European RECS, the Issuing Bodies are financially separate because they have access to market information that would give a significant competitive advantage. In New England, an agreement was reached with APX that if APX started a certificate trading market in New England, information available to APX would have to be made available to all other market participants. In Texas, they avoided this problem by having APX only develop the software, but not run the system.

Small-scale Generation

There was interest in making sure systems can accommodate small-scale, on-site generation. In Texas, there are RECs aggregators that are authorized to aggregate small on-site generation and they have to defend the data used in determining the amount generated to TX PUC. This is an issue for individual domains.

Existing Contracts

It was observed that issues might arise with generators that have existing contracts that don't specify the ownership of certificates, including PURPA short-term obligations. There was a question as to whether the AAIB or Issuing Bodies could mediate disputes as to ownership of certificates.

NAFTA Concerns

The AAIB must be mindful to avoid creating NAFTA issues or triggering NAFTA challenges. There needs to be more research on the legal issues. It was noted that NAFTA applies to government policy and mandatory programs, but non-mandatory non-governmental programs are generally exempt from NAFTA. However, it was thought that if the AAIB tried to exclude any types of renewable generators there could be a challenge.

Recommendations

From the discussion, several recommendations emerged.

Recommendations for the AAIB

Given the national RPS trajectory, the group recommends getting something started quickly, so that key issues can be resolved in advance of need.

- The AAIB should not attempt to exclude any types of renewable generators and should be mindful of potential NAFTA issues.
- The AAIB should help establish a default Issuing Body to issue certificates to facilities located in areas not presently served by an existing issuing body as soon as possible.
- The AAIB should strive for the development of a few larger Issuing Bodies that can serve multiple functions and cover multi-state territories.
- The AAIB should reach out to include state regulators and those involved in RTO talks in the initial concept deliberations.
- The AAIB must create rules that enable secure and seamless communication between Issuing Bodies
- The cost of participation in the AAIB should be kept as low as possible
- The agreements between Issuing Bodies should be designed so that the information tracked by each Issuing Body can be used for a variety of purposes
- The AAIB should include Issuing Bodies from Canada and Mexico

Recommendations for Rules Governing Issuing Bodies

- Issuing Bodies do not need to quantify emissions offsets or track emissions from a particular facility. However, the Issuing Bodies should have enough generator information carried on the certificate so that the certificate can be used in current or future emissions markets.
- There has to be coordination and agreements in place to prevent more than one Issuing Body from issuing certificates from a specific generation facility.
- Issuing Bodies should be able to track whether or not emissions attributes have been split off from a certificate.
- In the start-up phase, participating Issuing Bodies don't need to have the capability of importing certificates, only the capability of exporting certificates
- Issuing Bodies should be financially independent of the market
- Issuing Bodies should be able to accommodate the following (though these may be implemented in phases): All generation types, small distributed generation, various disclosure systems, various pollutant offset systems, rural off-grid renewables

Recommendations for Implementation

Goals for Phase I

- Creation of a system that is capable of ensuring proper tracking
- Design network to be able to satisfy verification of environmental disclosure for states requiring such verification
- Fundamental definitions and protocol developed
- Basic commitment agreed upon by all participating Issuing Bodies
- Establishment of an AAIB
- Establishment of a default Issuing Body

Phase II and later

- Mechanism for handling indirect emissions offset information
- Capability to track all generation, not just renewable
- Mechanism for handling aggregated small, on-site and rural systems
- Address earmarking issues
- Address separation of attributes

Roundtable Comments: Is the concept of an AAIB worth pursuing?

As a final check on support for the concept, we went around the table and asked each participant to tell us what they thought after the full day of discussion. The result was that there was unanimous support for moving ahead on the concept and for the recommendations outlined earlier in this document.

The following general comments were received:

- AAIB can help markets to develop and should be as inclusive as possible
- The development of an AAIB is a stepping stone toward national RPS markets
- There is benefit in bringing fiduciary responsibility to market through the establishment of an AAIB
- The development of a national network of TRC issuers will increase market credibility and will allow more trades to occur
- TRC regional tracking mechanism will support retail disclosure laws
- Depending on whether or not an RPS becomes mandated for CA will determine how involved the California Energy Commission is in this effort. If an RPS is passed in CA, the CA Energy Commission may be interested in becoming the Issuing Body for CA and possibly expanding to WSCC states
- NYSERDA supports any process that allows NY renewables to be sold in as large a geographic area as possible.
- Development of an expandable network is a good idea, but it may be difficult to convince regulatory people that they should contribute dollars
- Numerous people stated that they like idea of creating largest body possible
- Canadian ECOlogo has a voluntary tracking system, so Canada may not have the same urgency to establish a network
- It was suggested that this should be a robust stakeholder process and CRS should make sure that all stakeholders are represented
- This effort should be focused on the needs of the voluntary TRC market instead of trying to meet the needs of a mandatory market
- There was a concern raised regarding benefits v. costs of development of the AAIB and a national network
- It was suggested that because margins are so small on TRC transaction, the AAIB might want to consider energy attributes only to start and worry about air emissions quantification or by somebody else at later time, or not at all.
- The AAIB should focus on wholesale transactions but not get involved in retail transactions
- ERCOT was interested in the idea of expanding their system to cover other regions, but don't have approval to do that right now
- AAIB should strive for simplicity to keep costs down

Announcements

There will be a meeting on the European AIB in Oslo, Norway May 31, 2002. All are invited to participate.

APPENDIX II: AAIB DRAFT BASIC COMMITMENT

Please note that highlighted areas indicate areas for discussion at the March 26, 2002 meeting.

Article 1. Basic Commitment

- 1.1 The **Basic Commitment** (this document) is the minimum common set of definitions and criteria for the creation, issue, transfer and use as evidence of transfer of ownership and eventually removal from the market of tradable renewable certificates (TRC) and may only be amended or added to by the American Association of Issuing Bodies following a procedure of consultation in which the interests of participating TRC Members are duly regarded.
- 2.2 Rules that are supplementary to the Basic Commitment and apply to one Domain only will be contained in the corresponding **Domain Protocol**.

Article 2: Definitions

- 2.1 **Renewable Energy** shall comprise all energy excluding fossil and nuclear fuels and electrical energy derived from those sources. Electricity produced from Renewable Energy sources is referred to in this document as **RE**.
- 2.2 Electrical energy shall be measured in megawatt hours, which shall be referred to in this document as **MWh**.
- 2.3 **Public Support** is any relevant direct or indirect support whether from regional, national or international (for example European Union) public funds or comparable support schemes, excluding that provided by means of and relating to TRC Certificates.
- 2.4 **A TRC Certificate:**
 - a. Shall represent the entire benefit of RE over electricity from non-renewable sources. A participating TRC Member and parties represented by it may not separately claim or confer rights or title to any element of this benefit;
 - b. Provides a record as specified in Article 3.14 of this Basic Commitment of the generation of a standard quantity of one megawatt hour (1 MWh) of RE;
 - c. Shall remain valid until it has been redeemed or retired;
 - d. Forms the basis of transfers of ownership between parties and title to it may change until it has been redeemed; and
 - e. All records relating to it including any transfer of ownership shall be retained by each of the parties to the transfer of ownership and by the corresponding Issuing Body for a period of not less than ten years after it has been redeemed, or so much longer as required by the laws of the state or country in which it was issued.

- 2.5 An **Earmarked Certificate** specifies that Public Support has been received by the RE Generator for the associated Production Device or the electricity produced by it. The Issuing Body in accordance with Article 3.7.g shall maintain details of this support.
- 2.6 A **Production Device** is a separately metered device or group of devices that generates electricity.
- 2.7 A **Consumer** of electricity is an end user of electrical energy.
- 2.8 An electricity **Transportation System** is a collective term for the electricity distribution and transmission systems that together transport electrical energy from a Production Device to a Consumer.
- 2.9 A **Domain** will normally be defined by its geopolitical boundaries. Such boundaries may adopt or be different to those of the associated transportation System that may in some cases overlap geopolitical boundaries.
- 2.10 For each Domain, the AAIB shall appoint one **Issuing Body**, which shall:
- a. Be the only such body that is responsible within that Domain for:
 - i. Ensuring that the Basic Commitment and relevant Domain Protocol are observed within its domain in the creation, issue and redemption of TRC Certificates and their use as evidence of transfers of TRC Certificate ownership;
 - ii. Inspecting, as set out in the Domain Protocol for the Domain in which that Production Device is registered, all RE Production Devices that wish to participate in TRC, including inspecting their metering equipment and any associated engineering, accounting and metering records in order to verify that they comply with TRC criteria as set out in the Domain Protocol and, where appropriate, approving and registering them for participation in TRC;
 - iii. From time to time, requiring the repetition of such inspection at its sole discretion in order to assure itself of continued compliance, confirming or removing such Registration as appropriate;
 - iv. Issuing transferring ownership of and Redeeming TRC Certificates; and
 - v. Recording in a **Central Registration Database (CRD)** details of all issued TRC Certificates within its Domain including their current ownership.
 - b. Seek and gain recognition under such quality standards as the American Association of Issuing Bodies considers appropriate.

- 2.11 If the Issuing Body outsources to an agent, then the Issuing Body shall remain responsible for the proper functioning according to the provisions to the Basic Commitment of that body as its agent, and the agent shall be subject to and will have the rights and responsibilities conferred by the relevant conditions of the Basic Commitment that apply to Issuing Bodies.
- 2.12 The **TRC American Association of Issuing Bodies** is the American alliance of TRC Issuing Bodies and is responsible for approving and accepting all Issuing Bodies wishing to issue internationally acceptable TRC Certificates in this region.
- 2.13 A **Generator** is a body engaged in the production of electricity by means of one or more Production Devices.
- 2.14 A **Renewable Energy Declaration (RED)** shall be made by any RE Generator wishing to receive TRC Certificates for a specific Production Device to the Issuing Body with responsibility for the Domain in which this Production Device is located, and shall state that the Production Device produces RE.
- 2.15 Each Issuing Body shall be responsible for:
- a. **Issuing** TRC Certificates for Production Devices within its Domain, including creating a corresponding entry in the appropriate Transferable Account on the CRD.
 - b. **Redeeming** TRC Certificates that it has issued, including transferring the TRC Certificate from the appropriate Transferable Account for that TRC Certificate Owner on the CRD to the corresponding Redemption Account.
 - c. **Transferable Account** is the account of a TRC Certificate Owner as indicated by a Domain CRD.
- 2.16 A **TRC Certificate Owner** is a body holding a transferable TRC Certificate, and shall use the TRC Certificate to provide evidence of ownership should it wish to transfer ownership to another party or otherwise Redeem it.
- 2.17 A **Production Aggregator** is a Participating TRC Member who is bound by the rules of TRC and acts for one or more RE Generators.
- 2.18 **Registration** refers variously to the recording of transfers of ownership, the inspection and approval of RE Production Devices for participation in TRC, and the acceptance of the various bodies responsible for administering TRC.
- 2.19 A **Participating TRC Member** is a party that has been accepted into TRC by the relevant Issuing Body or the Association of Issuing Bodies as appropriate and agrees to be bound by the basic Commitment and relevant Domain Protocol for the Domain or Domains in which it is commercially active.

Article 3: Issuing of Certificates

Overall responsibilities of an Issuing Body

- 3.1 Each Issuing Body shall explicitly identify the Domain or Domains within which it has been appointed to issue TRC Certificates.
- 3.2 Only one Issuing Body shall issue TRC Certificates in any single Domain.
- 3.3 Issuing Bodies may not at any time hold title to TRC Certificates, nor may any body holding title to TRC Certificates be a subsidiary, parent or related undertaking or operate as or have any controlling financial interest in an issuing body.
- 3.4 Issuing Bodies may not at any time be a subsidiary, parent or related undertaking nor shall they operate as or have any financial interest in a Generator, the Production Aggregator or other market players.

Registration of a Production Device

- 3.5 **Registration:** A RE Generator or a Production Aggregator acting on behalf of a RE Generator wishing to receive TRC Certificates for the electrical output from a RE Production Device shall first gain Registration for that Production Device from the Issuing Body responsible for the Domain within which the Production Device lies by making a Renewable Energy Declaration (RED) to the Issuing Body. Any Production Device that is not so Registered may not be issued with TRC Certificates.
- 3.6 A Renewable Energy Declaration shall state that the installation fulfills the criteria set out in this Basic Commitment and relevant Domain Protocol. The RED must have a period of validity limited according to the Domain Protocol for the Domain in which this Production Device is registered but will in any case be no longer than 5 years, after which time it must be re-submitted. Failure to do so will result in cessation of certificate issue for this Production Device. The criteria and the procedure for the RED may change over time.
- 3.7 A Renewable Energy Declaration shall include:
 - a. The name, address, contact details (including person responsible, phone, fax and email) and Issuing Body for that RE Generator or of a Production Aggregator acting on its behalf;
 - b. The location of the Production Device;
 - c. The location and detail of the export and, where appropriate, import meter(s);

- d. All possible sources of fuel to be converted into electrical energy by this Production Device, whether or not this is renewable, from the agreed list as set out in Annex I to this Basic Commitment;
 - e. The type of generation technology in place at this Production Device, from the agreed list as set out in Annex I to this Basic Commitment;
 - f. The installed capacity of this Production Device;
 - G. The date of commissioning of this Production Device;
 - h. Any schemes associated with any Public Support from the list set out in Annex 1 to this Basic Commitment that are or have been received in addition to TRC Certificates by this Production Device, together with an indication as to whether they are currently being received;
 - i. A guarantee that the RE Generator owning this Production Device will not during the period of its Registration and for the same unit of electrical energy receive certificates representing the benefit of renewable electricity generation from both TRC and another similar system;
 - j. A diagram showing the Production Device, the location of export meters used for metering its generation and of transformer substations at the plat site. If there are generating auxiliaries for the Production Device and/or import meters for metering their demand these shall also be shown on the diagram;
 - k. For RE Generator's using biomass fuels, information on the emissions from such biomass generating facilities as described in Annex 1 to this document; and
 - l. Any additional information required by the Issuing Body as contained in the Domain Protocol.
- 3.8 Should any planned or unplanned change to a Production Device, including changes to any Public Support received by it, render the statements made in the RED inaccurate, then the corresponding RE Generator or the Production Aggregator acting on its behalf shall:
- a. Inform the appropriate Issuing Body prior to planned changes coming into effect or immediately where such changes are unplanned; and
 - b. Not receive TRC Certificates in association with this Production Device other than in its original state until it has been re-Registered by the Issuing Body.
- 3.9 Each Production Device shall be assigned a unique identifier as defined in Article 3.14.c.

- 3.10 The current details as set out in the Renewable Energy Declaration (see Article 3.6) of each Production Device that has been Registered shall be made available in electronic form to each Participating TRC Member.
- 3.11 The Issuing Body shall publish clear and unambiguous procedures for the Registration of Production Devices. These procedures shall require that the RE Generator or the Production Aggregator acting on its behalf:
- a. Completes and provides to the Issuing Body a RED;
 - b. Will permit the Issuing Body to inspect the Product Device and such records as it considers to be necessary to verify the authenticity of the RED and that such inspection may be conducted without prior announcement;
 - c. Requests an account on the CRD where the issued TRC Certificates for the Production Device will be deposited;
 - d. Discloses details of any past infringements of Domain or inter-Domain agreements regarding TRC Certificates and including the Basic Commitment and any Domain Protocol by itself or by any subsidiary, parent or related undertaking;
 - e. Provides details of an officially endorsed source of meter readings, the means of collecting these, approval for their collection and accepts liability for the delivery, quality and accuracy of these meter readings;
 - f. Guarantees that all support schemes listed in Annex 1 to this Basic Commitment that are associated with this Production Device have been disclosed on the RE Declaration and that it will not during the period of its Registration and for the same unit of electrical energy receive certificates representing the benefit of renewable electricity generation from both TRC and another similar system.
- 3.12 If a RE Generator seeking Registration with TRC of a Production Device meets the criteria for participating in TRC then the Issuing Body shall accept the application even if that type of Production Device is not eligible to participate in specific programs within the Domain.
- 3.13 If a Production Device belonging to a RE Generator has been Registered with TRC then the Issuing Body shall issue to that RE Generator such certificates as are supported by evidence of generation by that Production Device of a corresponding amount of electricity from renewable sources, as evidenced by appropriate meter readings and statements of the proportion of electricity from renewable sources.

Issuing of TRC Certificates

3.14. A TRC Certificate shall exist as the following electronic record:

- a. **Unique TRC Certificate Number:** A certificate will be identified by a number that also identifies the Domain of origin -- 30 numeric characters;
- b. **Issuing Body:** The identity of the Issuing Body (and the Domain) that issued the TRC Certificate. The AAIB shall keep a list of recognized issuing Bodies (this forms Annex I to this Basic Commitment) -- 3 numeric characters;
- c. **Production Device:** A reference to the Production Device that generated electricity of which details are publicly available (as set out in Article 3.10). The Production Device will be identified by a number that also identifies the domain of origin and other characteristics listed below -- 30 numeric characters;
 - i. **Date of commissioning:** The calendar year and month when the facility first began generating power. Of the format YYMM -- 4 numeric characters.
 - ii. **Time of issuing:** The calendar year and month when the energy associated with this TRC certificate was fully delivered. Of the format CCYYMMDD -- 8 numeric characters;
 - iii. **Technology code:** A reference to the technology with which the electricity was generated (as set out in the list in Annex I to this Basic Commitment) -- 2 characters;
 - iv. **Earmark:** An indication whether any Public Support is currently or has in the past been received, and of which further details are publicly available - one numeric character, where acceptable values are:

0 (zero)	=	No Public Support;
1 (one)	=	Public Support for investment in Production Devices that produce RE;
2 (two)	=	Public Support for the ongoing production for RE; and
3 (three)	=	Public Support for both the investment in Production Devices that product RE and for the ongoing production of RE;
 - v. **Other facility characteristics:** 2 numeric characters
 - 4 (four) = Labor Characteristics
 - 5 (five) = RPS Eligibility

- g. **Installed capacity:** The installed capacity of the Production Device that generated the electricity, in kilowatts -- 7 numeric characters.
- 3.15 Only RE shall be eligible to receive TRC Certificates, the quantity issued reflecting the amount of net electrical energy generated as evidenced by meter readings adjusted by meter amendments and the outcome of any disputes. The net electrical energy generation is the gross production minus demand of any generating auxiliaries and minus losses in the main generator transformers on the site of the Production Device. The frequencies with which meter data is monitored and TRC Certificates are issued shall form part of the Domain Protocol.
- 3.16 A Production Device may not during the period of its Registration with TRC and for the same unit of electrical energy receive evidence such as certificates representing the benefit of renewable electricity generation from both TRC and another system that similarly certifies the origin or represents the benefits of the associated renewable electricity.
- 3.17 On receipt of evidence of generation of a set quantity of electricity by a registered TRC Generator either from that RE Generator, the system operator or from a Production Aggregator acting on its behalf, the Issuing Body with responsibility for that Domain shall:
 - a. Issue a TRC Certificate to the RE Generator or Production Aggregator by creating an appropriate entry in the Transferable Account for that RE Generator; and
 - b. Inform the TRC Certificate Owner of the details of the issued TRC Certificate.

By default, the first owner of a TRC Certificate shall be the RE Generator responsible for production of this RE.

- 3.18 The integrity of TRC Certificate shall be maintained at all times:
 - a. Once it has been created, changes to a TRC Certificate shall not be allowed; and
 - b. The elements of the record associated with a RECS Certificate shall always be kept together in all data transfers.
- 3.19 All information contained in the RED that is not shown directly on the TRC Certificate shall be made available upon application to the Issuing Body.

Article 4: Transfer of ownership of certificates

- 4.1 The manual and automated information systems implemented by an

Issuing Body must be both robust and secure, and support ad hoc audit of the Issuing Body including enabling inspection of all transactions associated with all or specific TRC Certificates.

- 4.2 A TRC Certificate owner wishing to transfer ownership of a TRC Certificate to another participating TRC Member or, where applicable, the exchange effecting such transfer of ownership shall notify the Issuing Body that is responsible for the Domain in which the TRC Certificate is currently registered of the transfer of ownership of the TRC Certificate.
- 4.3 On receipt of a request to transfer ownership of a TRC Certificate from a TRC Certificate Owner or, where applicable, the exchange effecting such transfer of ownership, the Issuing Body shall:
 - a. Record the transfer of title in the Transferable Accounts of the parties to the transfer of ownership on the CRD, which shall provide evidence of title;
 - b. Retain all supporting documentation relating to transactions; and
 - c. Except as provided in Article 4.5, confirm such transfer to both parties to the transfer of ownership, where both parties to the transfer of ownership are situated within its Domain.
- 4.4 Transfer of ownership of TRC Certificates may be through private, bilateral arrangements between parties or through an intermediary (for example, an exchange or brokerage).
- 4.5 The Issuing Body shall have sole responsibility for the import and export of TRC Certificates into and out of its Domain.
- 4.6 A Participating TRC Member (or, where applicable, the exchange acting for it) wishing to export a TRC Certificate from a Domain shall notify the Issuing Body for that Domain of the unique numbers of the TRC Certificates to be transferred, the destination Domain and the account number of the recipient of the Central Registration Database of that Domain.
- 4.7 On receipt of a request to export TRC Certificates the Issuing Body responsible for the exporting Domain shall:
 - a. Confirm the validity of the TRC Certificates;
 - b. Record the export in the Central Registration Database, amending the status of the TRC Certificate to 'exported;'
 - c. Send details of the exported TRC Certificates and the account number of the intended recipient in the Central Registration Database of the corresponding Domain to the Issuing Body of the importing Domain; and

- d. Notify the seller that the TRC Certificates have been marked as ‘exported’ and transferred to the Issuing Body of the importing Domain.
- 4.8 On receiving details of the exported TRC Certificates and the account number of the intended recipient in the Central Registration Database of the corresponding Domain from the Issuing Body for another Domain, the Issuing Body of the importing Domain shall;
- a. Confirm that the TRC Certificates received meet the criteria specified in the Domain Protocol for the importing Domain;
 - b. Transfer the TRC Certificates to the account of the recipient in the Central Registration Database;
 - c. Notify the recipient of the TRC Certificates of this transfer of ownership; and
 - d. Confirm the successful completion of the transfer of ownership to the Issuing Body of the exporting Domain, which shall in turn notify the seller of the TRC Certificate.
- 4.9 Should an exported TRC Certificate not meet the criteria of the importing Domain as set out in its Domain Protocol, then the Issuing Body of that Domain shall notify the Issuing Body of the exporting Domain. In such cases:
- a. Such additional information as is required by the Issuing Body of the importing Domain shall be exchanged between the Issuing Bodies; or
 - b. The TRC Certificates shall be returned to the Domain of origin, the status of ‘exported’ cancelled, and the seller notified.
- 4.10 Any TRC Certificates Owner may retain or ‘bank’ its TRC Certificates for an unlimited period unless otherwise required by law.
- 4.11 Upon receipt of a request from a TRC Certificate Owner to issue a printed official TRC Certificate, the Issuing Body with which the TRC Certificate is currently registered will:
- a. Transfer details of that TRC Certificate from the appropriate Transferable Account on the CRD for that TRC Certificate Owner to the corresponding Redemption Account, to indicate that ownership of the TRC Certificate is no longer transferable; and
 - b. Provide the TRC Certificate Owner with a printed copy of the TRC Certificate and confirmation that the TRC Certificate has been redeemed.

- 4.12 Each Issuing Body shall maintain and make public a list of those schemes requiring TRC Certificates as evidence of compliance in their Domain.
- 4.13 A TRC Certificate may be Redeemed for any of the following reasons:
- a. Upon request from a TRC Certificate Owner for purposes that are agreed in its Domain context (e.g. to comply with an agreement for the generation or supply of RE; to discharge an obligation to Government; in return for tax credits, etc.);
 - b. To advertise the activities or products of a TRC Certificate Owner who requests that a TRC Certificate is redeemed; or
 - c. For any reason other than those listed above.
- 4.14 Upon receipt of a request from a TRC Certificate Owner to Redeem a TRC Certificate, the Issuing Body with which the TRC Certificate is currently listed shall:
- a. Transfer that TRC Certificate from the appropriate Transferable Account on the CRD to the corresponding Redemption Account to indicate that the TRC Certificate has been redeemed and that ownership is no longer transferable;
 - b. Inform the TRC Certificate Owner of the details of the transfer, including the details held on the certificate, confirming in a declaration of redemption that the TRC Certificate has been Redeemed; and
 - c. Make available details of the TRC Certificate to the redeeming body and its auditors.
- 4.15 Where an Issuing Body finds and has supporting evidence to prove that a TRC Certificate being imported into or exported from its Domain contravenes TRC criteria as embodied in the Basic Commitment and the appropriate Domain Protocol or has been otherwise issued improperly, then it shall bring this to the attention of the other Issuing Body. Where the Issuing Bodies jointly are unable to resolve the problem then they shall bring this to the attention of the American Association of Issuing Bodies who will arbitrate in cases of dispute and whose decision will be final in all cases.

Article 5: Registration databases

- 5.1 Each Issuing Body shall:

- a. Maintain and make public records of each Production Device that is has at any time registered within its Domain including details of its Registration including, where appropriate, the original RED and any notifications of change to this RED during the period of its registration.
- b. Maintain records in the CRD of each TRC Certificate that it has issued. These records shall include the current owner and transferability of the TRC Certificate.

Article 6: Verification, audits and reports

6.1 All parties to TRC shall:

- a. Observe the requirements of this Basic Commitment. Failure to do so shall be referred to the Association of Issuing Bodies, which may take such action as it considers necessary.

6.2 Each RE Generator shall:

- a. Periodically confirm that the claimed RE production is consistent with physical meter reading.

6.3 Each Issuing Body shall be responsible for:

- a. Performing ad hoc checks on Registered Production Devices to ensure that the corresponding RED correctly reflects the current state of the Production Device and to confirm that TRC criteria set down in the Basic Commitment and the relevant Domain Protocol are being observed. Should any abuses of the system be discovered then the Issuing Body shall take such appropriate action as it sees fit and inform the Association of Issuing Bodies should such abuse be capable of affecting the conduct of TRC Certificate transfers of ownership outside of the Domain of the Issuing Body.
- b. Ensuring that the claimed RE production has actually taken place, and may demand ad hoc or scheduled access to all records and meters associated with Registered Production Devices and require sight of documentation associated with the Public Support associated with the Production Device; and
- c. Assuring the validity of REDs, claimed RE production, registration of transfers of ownership and Redemption of TRC Certificates; and for ensuring that the associated procedures are robust, effective, efficient and adequate.

6.4 Each Issuing Body:

- a. Shall monitor all activity in the TRC market within its Domain;
- b. Shall publish regular reports on the numbers of TRC Certificates issued, imports and exports and those no longer transferable as a consequence of redemption;
- c. Shall publish regular reports on the functioning and efficiency of the market;
- d. Shall report any instances of non-compliance with TRC rules by market player(s) to national and international competition authorities as appropriate and the

Association of Issuing Bodies which may take such action as is defined in the Domain Protocol.

Article 7: Investigations and modification requests and disputes

- 7.1 Any Participating TRC Members or Members may request the investigation of or modification to the operation of TRC:
- a. Within the Domain within which it is commercially active, including without limitation modification of the Domain Protocol;
 - b. Outside of the Domain within which it is commercially active, including without limitation modification of the Basic Commitment.

Such request must include a detailed description including an exact specification of any proposed modification of the Domain Protocol or Basic Commitment, and be passed in writing to the Issuing Body responsible for that Domain and must be consistent with relevant laws and regulations in that Domain.

- 7.2 Each Issuing Body may:
- a. With the approval of the American Association of Issuing Bodies make such modifications to the Domain Protocol as are in its opinion necessary to the effective and efficient operation of the market and which will maintain compliance with this Basic Commitment;
 - b. Propose modifications to the Basic Commitment. The American Association of Issuing Bodies (AAIB) shall consider the implementation of such proposed modifications.
- 7.3 On receipt of such a request as specified in 7.1, an Issuing Body shall:
- a. Consult with the Participating TRC Members within its Domain;
 - b. Decide whether the request and its consequences are in its opinion reasonable;
 - c. Inform the Participating TRC Member or Members whatever the outcome of this decision;
 - d. Notify in writing any requests that may have implications outside of its own Domain to the American Association of Issuing Bodies, which will conduct any necessary investigations and institute proceedings to modify the Basic Commitment as necessary.
- 7.4 The Participating TRC Member or Members that raised the request may appeal to the American Association of Issuing Bodies against any decision given according to 7.3

7.5 All actions set out in this Article 7 should be undertaken in accordance with the relevant Domain Protocol and the Articles of Association and rules of the American Association of Issuing Bodies, where the Articles of Association and rules of the AAIB shall take precedence.