

Association of Issuing Bodies

Editorial

The year 2007 sees much change in the Association:

- A wider scope, with the development of the CHP scheme and membership applications from new domains;
- New officials;
- A developing relationship with the European Commission;
- Development of the inter-registry Hub nearing completion; and
- A more professional public image, with the development of the Annual Report, a new format newsletter and press releases.

The reach of the Association continues to grow, as demonstrated by the publication of reports from issuing bodies outside of Europe—Russia, Australia and the United States. Further developments are expected later in 2007, and details will be released in this newsletter.



Guido de Wilt (European Commission) addresses the General Meeting on the implementation of the CHP Directive.

Statistics update

(all figures 1MWh certificates)

Since 2001:

- ISSUED: 204 million
- REDEEMED: 97 million

In 2006:

- ISSUED: 65 million
- REDEEMED: 38 million

Brussels GM

The General Meeting focused on CHP guarantees of origin and Disclosure; reviewing 2006 member activity and financial performance; and approving revised regulations.

After two years as chairman of the Board, Jon Hov Lauritzen (*right*) was thanked by the General Meeting for doing a great job. He leaves the Association due to a new position at Statnett. Jon's chair has been taken by Marko Lehtovaara of Finland (pictured above with Guido de Wilt), who was elected unanimously. His election, given his recognised technical skills and track record within Workgroup Systems, demonstrates the commitment of AIB to implement the inter-registry Hub.

The Board also welcomed two further members: Ulf Moller of Norway, and Thierry van Craenenbroeck of Flanders (*below left and centre*). This enlargement of the Board is a constructive response to the new challenges of the market, and of the opening up of AIB to new members.



Lastly, Tomas Lah (*right*) was elected chairman of the Systems workgroup, replacing Ursula Maarse (*far right*), who was thanked for her contribution.



Annual report

The first AIB annual report will be published soon. Anyone wishing to receive a printed copy should contact the Secretariat via email (secgen@aib-net.org). Copies of the report in Adobe Acrobat format will be able to be downloaded from the website, at www.aib-net.org, by 1st April.

The Hub

The Hub has been designed to simplify the transfer of EECS certificates between operators. It is currently being tested, and is expected to be operational by the end of April. More details will follow, in the next issue of this newsletter.

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EC Update

ETRACK

As part of liberalisation of European energy markets, electricity suppliers must tell consumers where their energy comes from. This means the energy market must keep accounts of how electricity is generated, coordinated at a European level, and track this information from seller to buyer.

The E-TRACK project proposes a European tracking standard for electricity, which builds upon existing international certificate schemes. The Brussels conference presented the proposal and its implications, discussing the future of energy certification.

The keynote speech ("Competition and Transparency in Electricity markets") was given by Claude Turmes, MEP (see [article](#)).

CHP

The European Commission approved the reference values last December, and on 6 February 2007 published them in the Official Journal. The CHP Committee is completing the calculation methodology, and the final version of the Guidelines is expected early next year. Member States have until 6 August to implement the Directive and start issuing Guarantees of Origin (see [article](#)).

ASSOCIATION MATTERS

First periodic review performed

For some, the idea of a review may sound frightening. Although all the members of AIB attempt to conform to the rules of the PRO to perfection, there may still be some doubt whether their vigilance has been sufficient, and hence if all the specific processes in the administration of their scheme are in compliance with the Principles and Rules of Operation (PRO) of EECS.

For the VREG, the energy regulator and guarantee of origin issuing body for Flanders, the review was welcome. When the three reviewers from CertiQ and Energinet.dk arrived, the VREG received them as business partners and were prepared to help the reviewers with any questions. Ideally, that is how the review should be performed.

Although the purpose of the review is to demonstrate the credibility of the system by ensuring that AIB members comply with the PRO, it is emphasised that this should be done in a spirit of cooperation. So what does that mean? It simply means that the reviewers and the reviewed IB cooperate towards finding the best possible way of fulfilling the obligations of the PRO within the legal basis of a national legislation. One great advantage in achieving this aim is that the knowledge of three Issuing Bodies is assembled at

one location with the sole purpose of discussing the day-to-day work of issuing and handling certificates for a single IB.

“VREG received them as business partners and were prepared to help the reviewers with any questions. And ideally, that is exactly how the review should be performed”

In the coming months, AIB members will begin to perform periodic reviews at the offices of their peers. For this purpose, AIB has published a report with a guide to the review procedure, explaining the obligations of a reviewer as set out in Subsidiary Document 7: “Review Procedures”. The review of the VREG helped identify some practical issues: this can assist future reviewers, and may be used as an aid along with this report. One of these is the time schedule of the review, which the review panel should discuss and decide on beforehand. One of the functions of this planning is to make the review as efficient as possible, by being aware of exactly which topics should be covered and the amount of time needed for each topic. The advantage of beginning the review with an

introduction of the reviewed scheme is that it ensures that the reviewers understand the system before beginning the review of the specific obligations.

In the case of the review of the VREG, the reviewers wrote the report on the night of the review. The advantage of this approach was that the report was written with the three reviewers present, while the information was still fresh in mind. Moreover, the report could be presented to the VREG for signing the following morning. Although performing a review may be seen as a big task, this approach helped keep the time spent on the review low.

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Proposal for a coordinated approach to tracking of electricity attributes supports EECS

On 9 March 2007, the EU-funded project “A European Tracking System for Electricity (E-TRACK)” presented its final recommendations to the public at a conference in Brussels with more than 120 participants.

The proposed European standard for tracking of electricity attributes encompasses the European Energy Certificate System (EECS) as a backbone, which is supplemented by a residual mix to be used for purposes of disclosure (cf. the IRM project of the AIB). The project also proposes to clarify the role of Guarantees of Origin as certificates which are supporting electricity disclosure as required by Article 3 (6) of Directive 2003/54/EC. Finally, the relation of support schemes for electricity from renewable energy sources and from high-efficient cogeneration to disclosure should be clarified by the responsible governments if not yet done so.

At the beginning of the conference, MEP Claude Turmes called for an intensified “true” competition in the electricity market. He emphasised that such competition should not only be based on price, but also on the quality of the electricity provided, which includes the attributes of power generation. Mr. Turmes also called for strong and continuous

support systems for those sustainable energy technologies which are not yet viable in the market.

In a second address to the conference, Guido de Wilt from the European Commission explained that all Member States are required to implement Guarantees of Origin for electricity from high-efficient cogeneration by August 2007.

The AIB and the Commission have worked closely together to develop a model that will support the CHP Directive, and this has resulted in the development of the CHP Chapter of EECS. According to Mr. de Wilt, this model is strongly recommended to all Member States, and any other approaches to the implementation of CHP GO will be benchmarked against the reliability and robustness of the joint AIB/Commission model.

Following a presentation of the proposed E-TRACK standard by the project team, several country representatives presented their approach to tracking of electricity. These presentations, along with the cases presented by the E-TRACK team, made clear that the approach to tracking varies considerably across European countries. They also made it clear that

due to missing coordination between tracking policies on the national level and between the countries, double counting of mainly green energy can and does occur.

“This underlines the importance of further coordination of how electricity disclosure, Guarantees of Origin and support systems are implemented in the different countries. The E-TRACK standard offers a pragmatic and flexible solution for this”, said Christof Timpe from Oeko-Institut, the coordinator of the E-TRACK project.

In two discussion panels, stakeholders discussed the implications of the proposed standard. The proposal was widely supported. However, Eurelectric and the European Federation of Energy Traders (EFET) pointed out that the additional cost must be justified by the interest of consumers in disclosure information.

Claes Hedenstrom and Peter Niermeijer from RECS international also strongly supported the proposed standard, but both they and EFET questioned the option to integrate tracking based on contracts (and not on de-linked certificates) in the national tracking system, emphasising that tracking may not undermine the

(Continued on page 3)

(Proposal for a coordinated approach to tracking of electricity attributes supports EECS — Continued from page 2)

liquidity in physical markets for electricity.

Christof Timpe explained that many countries currently base their tracking systems for disclosure partly on electricity contracts, and that it is possible to do so without affecting market liquidity— e.g. by accounting for the contracts only after the end of a calendar year.

Chris Pooley from Pure Energi and Herbert Ritter from the Austrian Energy Agency, who are partners in the E-TRACK project, demon-

strated that most of the elements of the proposed tracking standard are already present in many countries, and additional cost for completing the proposed coordination task would be low.

The E-TRACK project is supported by the European Commission through the Intelligent Energy Europe programme, and several members of the project consortium are members of the AIB. However, the E-TRACK project is independent of AIB.

A full documentation of the E-TRACK conference can be found on the project website: <http://www.e-track-project.org/conference.php>.

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ROUNDUP OF EUROPEAN EVENTS

CHP Guarantees of Origin

The major instrument for promoting Cogeneration (CHP) is Directive 2004-8-EC, which requires Member States to implement systems to guarantee the origin of high-efficiency CHP. This was adopted on 11 February 2004 with the intention of achieving complete transposition in Member States by 21 February 2006, but unfortunately comitology delayed this. On 21 December 2006, the Reference Values were agreed by the European Commission, and were published on 6 February 2007, meaning that Member States must issue Guarantees of Origin by 6 August 2007.

Article 5 of the CHP Directive requires Member States to put in place a scheme for Guarantees of Origin of electricity from high-efficiency CHP (CHP-GO). These CHP-GO will be based on the reference values which are to be formally approved by the Member States in June 2006, and were published on 6 February 2007, along with the official detailed guidelines for Annex II. Member States must administer the CHP-GO system themselves, or by means of bodies independent of generation and distribution within 6 months of the official adoption of these reference values. While schemes for CHP-GO are not necessarily linked to national support schemes for CHP, this is permissible.

Legal requirements for GOs are that they be

reliable, accurate, transparent, fraud resistant and recognised by all Member States. More specifically, there need to be a declaration of lower calorific value of the fuel source for the electricity; a specification of the use of the combined heat production; quantification of the electricity in conformance with Annex II; and specification of Primary Energy Savings (PES) based on the reference values.

The Commission wishes to provide assurance that as many Member States as possible will soon have schemes which comply with the CHP Directive; avoid too much diversity in national CHP-GO schemes, to facilitate mutual recognition and exchangeability in the internal market; create GOs that can be used for support schemes; create GOs that stakeholders can really use; and support a European system which has critical mass.

The Commission supports co-operation with the AIB, because the AIB encourages the Commission to confirm legal requirements following on from the CHP Directive and comitology. The Commission sees many positive elements in the AIB system: the AIB is controlled by TSOs and/or energy regulators, and already half of the EU Member States are represented in AIB and have substantial experience in trading GOs and certifies. EECS is voluntary, but used and ap-

preciated by major commercial players, including utilities and industry, and is robust and cost-effective. Critical mass has been achieved for the use of CHP-GOs on a European scale, and the ready-to-use nature of the system supports fast implementation of CHP-GOs by Member States.

The AIB formally adopted the text of the EECS chapter on 2nd July 2006, and continues to cooperate with the Commission to guarantee consistency with future CHP committee decisions, especially the calculation methodology. After this, it is up to Member States whether they join the AIB CHP-GO system. The AIB will continue to cooperate with the Commission to guarantee consistency with future CHP committee decisions, wider legislation and technological developments. It is anticipated that the Guidelines on the calculation methodology will be agreed in autumn, and adopted in mid-2008.

Calculation model

The AIB will publish a spreadsheet-based calculation model which complies with the latest vision on how the Directive should be implemented. The model enables Member States to implement compliant CHP-GO systems quickly and effectively. It is available to AIB members who wish to implement the AIB model for their governments.

Switzerland: Guarantees of Origin for RES-GO implemented

On 20th December 2006, Swiss government set in force the Swiss GO-law ("*Verordnung des UVEK über den Nachweis der Produktionsart und der Herkunft von Elektrizität*").

Based on this law, swissgrid (the Swiss transmission system operator, formerly known as ETRANS) has been mandated as Issuing Body for the issuing of Swiss renewable energy guarantees of origin (RES-GO), as required under European Directive 2001/77/EC.

The respective Swiss RES-GO system is based on the design of the Austrian RES-GO

system, which was provided by the Austrian electricity and gas regulator (E-Control) to Switzerland, in order to enable it to establish its own RES-GO system.

On the 6th of March 2007, Italy and Switzerland signed a Memorandum concerning the bilateral recognition of electricity from renewable sources. In this memorandum, RES-GO play a crucial role.

By the time of the AIB general meeting in Stockholm, in June 2007, the process of gaining accreditation of the Swiss RES-GO

system according to the EECS RES-GO chapter will have commenced.

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CHP Certificates with GOs in Flanders

Since 2002, Flanders has implemented a production support certificate mechanism, linked to a supplier quota obligation. The first target was to increase the production share of RES-E. This mechanism was copied a couple of years later for CHP, with the target/quota defined in terms of primary energy savings.

As of 2006 the RES-E support certificates also received disclosure functionality (guarantee of origin or GO), integrated on the same virtual certificate.

As of 2007, the corresponding CHP-GO disclosure functionality will be linked to the CHP certificates.

CHP-certificates have a minimum market value of 27€/MWh (primary energy savings), since the grid operators have an obligation to buy at this price. The certificate market price depends on the availability of certificates and the level of

the fine to be paid in case of non-compliance.

At present, this fine is set at 45€/MWh, and since there is a shortage of certificates, the market price is not much lower.

The suppliers can use both certificate functionalities separately. The only boundary condition is that the disclosure function should be used first, since redemption of the support (part of the) certificate makes the certificate obsolete.

The disclosure mechanism in Flanders is entirely based on GOs. No other proof of disclosure is accepted, neither for RES-E, nor for CHP. It is to be noted that, as a demand-side support mechanism, suppliers are exempted from a part of the federal energy contribution when the corresponding MWhs are disclosed as green or high efficiency CHP.

The market for GOs is a European one. Therefore, VREG supports the efforts of AIB and the EC to develop a unique standard for a CHP certificate, and is preparing the implementation in accordance with these prescriptions.

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GSE News : CHP and PV

Italy transposes CHP Directive into new law

The Italian government transposed the CHP Directive (2004/8/EC) into a new decree at the beginning of March. The Decree is intended to stimulate energy efficiency and improve the security of energy supply by creating a framework for the promotion and development of high-efficiency CHP producers to request CHP Guarantees of Origin. CHP-GOs have a size of 50MWh (generated electricity in excess of 25MWh is rounded up). Gestore Servizi Elettrici GSE is responsible for issuing the GoOs.

Photovoltaics

On 19th February 2007, a new decree supporting photovoltaic generation was approved by the Italian Ministry.

Gestore del Sistema Elettrico (GSE) remains responsible for managing the feed-in tariff system.

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Italian PV feed-in tariff system: mechanism introduced in Feb 2007

The new decree, issued on the 19th of February 2007, simplifies the application procedure. The applicant (responsible subject) must forward the request within 2 months of the starting date of actual operation of the power plant. The plant must have a capacity higher than 1 kW: no upper limit is established to receive the support. The annual limit for receiving financial support has been cancelled.

With an Italian target (to 2016) of 3,000 MW, the total capacity currently incentivised is capped at 1,200 MW, although plant built within 14 months (24 months for certain categories of applicants) after the total capacity will be reached can also receive feed-in tariff.

Support is guaranteed over a 20 year period and an annual regression of 2% is applied, starting from 2009.

A higher tariff (see the table below) is awarded

to those plants with a different level of architectural integration and an additional premium (up to a maximum of 30% of the tariffs) is awarded where a PV plant connected to a building achieves a certified efficient use of energy (10% energy saving, not including the benefits from the installed PV).

Furthermore, the tariffs are increased by 5% for special categories of applicants/application (for example, where the responsible subject is a public school, or the integrated panels replace a roof originally con-

structed from asbestos).

The measures provided by Ministerial decrees 28.07.05 and 6.02.06 are applied to PV plants positively assessed within 2006, according to the previous legislation.

Table (below): Feed-in tariff (€/cent/kWh) applied to PV plants entering into operation after the Regulator deliberation implementing the Ministerial decree, and no later than the 31st December 2008.

	Capacity of power plant	PV plant type (level of integration)		
		1) no integration	2) partial integration	3) full integration
A	1 ≤ P < 3	0,40	0,44	0,49
B	3 < P ≤ 20	0,38	0,42	0,46
C	P > 20	0,36	0,40	0,44

NEWS FROM ROUND THE WORLD

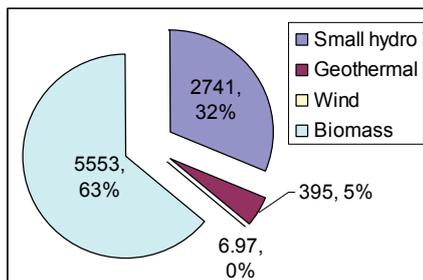
Prospects for RES-E and RE Certificates in Russia

The significance of renewable energy certificates for the Russian power sector was introduced by the **TRECKIN** network (www.treckin.org); confirmed by the **Rus-TREC** project (www.etaflorence.it/rustrec); and is being demonstrated by the draft Federal Law "On Support of Use of Renewable Energy Sources" prepared by "HydroOGK", for consideration in Russia early this year.

The level of RES-E generation in Russia is 8,695.8 million kWh, the split being as follows (2004 data, except biomass, which is 2005):

- Small hydro – 2,741 million kWh
- Geothermal – 395 million kWh
- Biomass – 5,553 million kWh
- Wind – 6.97 million kWh

Diagram 1: Annual RES Electrical Energy Generation in Russia in 2004-05



The volume excluding large hydro represents less than 1% of total Russian electrical energy consumption in 2005 (940 TWh) and 2006 (952.2 TWh). Including large hydro, this increases to 21% of total generation. These numbers again confirm the importance of rolling out national programmes and efforts for RES generation promotion.

How the Russian System may work

There is still a good deal of uncertainty about the destiny and final design of the Russian REC system, which is a mandatory element of the Draft RES Law. The initial REC scheme was discussed at the Vienna RECS/AIB seminar in November 2006, after which creative ideas and advice from the meeting were implemented. Now the basic framework has been defined, and is very much in line with European experience and guidelines.

Compensation for the additional costs of RES generation over and above market average price is based on price increments which take into account:

- Average operating conditions for certain types of RES facilities;
- Peculiarities of the construction and operation of these facilities; and

- Other conditions that materially impact cost of construction and operation.

It is fundamentally important that these price increments are applied to renewable power when this is sold either on the electrical energy market at market price; or at a regulated price (tariff) in territory which is not in one of the price zones of the wholesale market. Confirmation of such sale of renewable electrical power takes place through the issue of special certificates, which are awarded to generators in proportion to the volumes of energy produced and sold. These certificates are part of a nationwide mandatory confirmation system, the main features of which will be approved by the Federal Government.

These certificates are issued by either: the Administrator of the Trading System (Administrator of the Russian wholesale electrical energy market (www.np-ats.ru)); or its affiliated dedicated company as established by the Draft Law. The procedure for issuing certificates will be implemented in as established by the Russian Government, and will address such matters as issue procedure, and conditions of application for certificates.

The certificates issued in the mandatory confirmation system may also be used to confirm voluntary sale and purchase of RES-E and/or heat energy. Such a voluntary confirmation system may be initiated by a legal entity (or individual entrepreneur) or by a group. The creators of such a system independently determine the rules for the form and receipt of RECs.

The Draft Law requires that public distribution of information about the production (sale and purchase) of renewable electrical and/or heat energy may only occur if the distributor of this information owns a certificate from a voluntary or mandatory system to confirm the use of RES in accordance with Federal Law.

To receive its price increment, a generator must submit the received certificates to the Administrator of the Trading System (the Administrator of the Russian wholesale electrical energy market). These certificates only confirm the volume of a particular RES type, and are returned to the submitter. It is not just the generating entity that can submit certificates, but other entities as well: guaranteeing suppliers, intermediaries, traders etc. They all receive the sum of the price increments applicable to the particular type of renewable energy produced and sold.

To reiterate, renewable certificates in Russia can be used for:

- Monitoring generation and consumption of RES, and the progress of Federal programs;

- Mandatory support schemes;
- Confirmation of voluntary companies' obligations and REC markets; and

"Russian REC system ... very much in line with European experience and guidelines"

- Green labelling.

In view of the Draft Law coming up for discussion in the Federal Parliament, demonstration projects relating to different REC applications would be most useful and timely. Russia would be very interested in testing the scheme planned to be implemented within the framework of the RES Draft Law. Some international projects could be launched to follow up on RusTREC.

There also could be projects to demonstrate the advantages of international cooperation for issuing and transferring Russian certificates. Promising fields of cooperation might be.

- Technical harmonisation of the Russian REC system with RECS/AIB requirements;
- Conversion of RECs into related types of certificates; and
- Creation of forward agreements on technology transfer or/and power plant erection with the use of RECs (commercial and others).

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Environmental Certificates in Australia

Renewable Energy

Australia first introduced a national legislated renewable energy target (MRET) in April 2001 with targets rising to 2010 and remaining at that level to 2020. The target for 2010 is an 'additional' 9,500,000 MWh per annum - approximately the residential energy consumption of a city the size of Sydney.

“...MRET was the world's first national legislated renewable energy certificate target”

The term 'additional' refers to the baselining and exclusion from the benefits of the scheme of existing facilities for the generation of renewable energy which were operating prior to 1 January 1997. There is approximately 16,600,000 MWh of baselined renewable energy generation prior to 1 January 1997 which still exists, and this can only participate in the scheme once baselines are exceeded in a calendar year. Consequently the target for 2010 is effectively 25,500,000 MWh of renewable energy.

In related activity Australia also has a greenhouse gas emissions abatement system in New South Wales (NGAS) (since 2002), and a gas certificate trading scheme for electricity production of 13% in Queensland.

Claims have been made that the original MRET was the world's first national legislated renewable energy certificate target, and that the NGAS system was the world's first carbon emissions trading scheme.

Emissions reductions

In 2002, the New South Wales Greenhouse Gas Abatement Scheme came into force, offering certificates for emissions reductions from energy efficiency, low carbon fuels and sequestration as well as renewable energy (the ORER certificates are used for the latter). The scheme is run by IPART (<http://www.ipart.nsw.gov.au>).

ORER accepts accredited projects using biodiesel for power generation; and IPART gets RECs for a portion of their output (usually around 90% depending on the feed stock and esterification method).

All targets to date have been met mainly by REC surrender, as opposed to payment of penalties of A\$40/MWh as permitted by the Act. For example, the REC surrender rates for 2004, 2005 and 2006 were between 99.6% and 99.9% of the interim annual targets for those years. More details of the measure its operation can be found on www.orer.gov.au.

Details of all RECs are publicly available on www.rec-registry.gov.au.

Recent developments have had several States propose or legislate additional targets for their own jurisdictions. These include:

- VRET (Victorian Renewable Energy Target) of a further 3,274,000 MWh (10%) by 2016 (legislated);
- NRET (New South Wales Renewable Energy Target) of a further 1,317,000 MWh (10%) by 2010 and 7,250,000 (15%) by 2020;
- WARET (Western Australian Renewable Energy Target) under discussion possibly 20% RE; and
- SARET (South Australian Renewable Energy Target) under discussion possibly 20% RE.

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Tradable Renewable Energy Certificates: Establishment of a South African system

Based on the urgency of the energy transition situation in South Africa, it became apparent that government participation in a system to govern a voluntary TREC market was necessary.

This would foster public ownership of a system capable of monitoring progress in moving towards a sustainable energy supply system in order to allow the linkage of state support or obligatory mechanisms to this policy feedback scheme in the future.

A study was therefore commissioned to investigate the feasibility of establishing a national TREC system for South Africa in August 2005. It sought to determine precisely what form government involvement should take, was undertaken by a consortium led by Nano Energy, and completed in March 2007.

The project Steering Committee comprised representatives of the Department of Minerals and Energy, the National Energy Regulator of South Africa, and the Energy Development Corporation of the Central Energy Fund, as well as relevant stakeholders.

The feasibility study allowed the project team

to lead and advise members of the Steering Committee through the process of determining a suitable course of action in relation to the development of a TRECs market in South Africa.

It provided recommendations on the establishment of a TREC system for South Africa, and developed a detailed implementation plan for its establishment. The process of renewable energy certificate market development was already underway in the private sector at the time of commissioning, and the market participants were cognisant of the need for suitable governmental institutional backing of their initiative.

A project to establish a TREC trading system based on the implementation plan in the feasibility study is expected to kick off shortly with an official launch in Autumn 2007 and a budget is currently being finalised for this. In the meantime, until an issuing body has been formally appointed, TRECs are not permitted to be traded.

The draft final TRECs system feasibility study report is available at:

www.dme.gov.za/pdfs/energy/TRECS_5Feb07.pdf

... or by application to Jason Schaeffler (see contact details below).

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Renewable Energy Certificate Markets in the United States

The Birth of a market

The concept of separating the attributes of renewable generation as separate from the commodity electricity was first mentioned in the United States, during discussions on how to design a Renewable Portfolio Standard in California around 1996.

It wasn't until 1999, after recognizing the benefits of market liquidity, that the APX Green Power Market opened a wholesale market for "green tickets" in which buyers could bundle these tickets with commodity electricity for retail green power sales. In that same year, the Texas legislature established the first renewable credit trading program to facilitate tracking compliance with their Renewable Portfolio Standard (RPS).

Retail markets soon flourished, and the perceived risk to consumer confidence and potential for misleading marketing claims

In the **compliance** markets, TRCs are used to verify that a utility has met its obligation under a mandatory program like a Renewable Portfolio Standard (RPS).

In the **voluntary** market, retail sales allow businesses, institution and residential customers to purchase the rights to the renewable generation and offset their default electricity supply with renewable resources.

The voluntary market exists nationwide, and some national standards have been developed, such as the one used by the Center for Resource Solutions' Green-e program. In many cases TRCs are sold directly to customers independent of electricity, but they are also combined with electricity to supply utility green pricing programs and competitive electricity suppliers that may not have a regional or cost effective renewable resource available to meet their customers' demand.

Market Trends

Volumes

Overall TRC market volume has been steadily increasing, driven by increased consumer confidence in voluntary TRC markets and increases in compliance targets over time. Volume information is difficult to extract because of the flexibility of the TRC mechanism and the retail practice of packaging TRCs with commodity electricity before the point of sale. According to the best estimates available for 2005, total volume was approximately 23-27 million certificates, 18-20 million MWh in compliance markets and 5-7 million MWh in voluntary markets.

Voluntary Market

While the numbers vary depending on the source, the voluntary market for TRCs has seen a steady and substantial upward growth since reliable statistics were tracked beginning in 2002.

The US Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) provides yearly estimates of renewable energy market volume based on surveys of renewable energy providers, while certification programs such as Green-e gather information directly from sales and supply audits of certified providers in their programs. Therefore the most consistent and reliable data is available from certification programs with an annual supply audit.

Green-e (www.green-e.org) reported that in 2002, just under 150,000 TRCs were sold and in 2005, sales reached approximately 4.4 million TRCs, over a twenty-nine fold increase (see Figure 2).

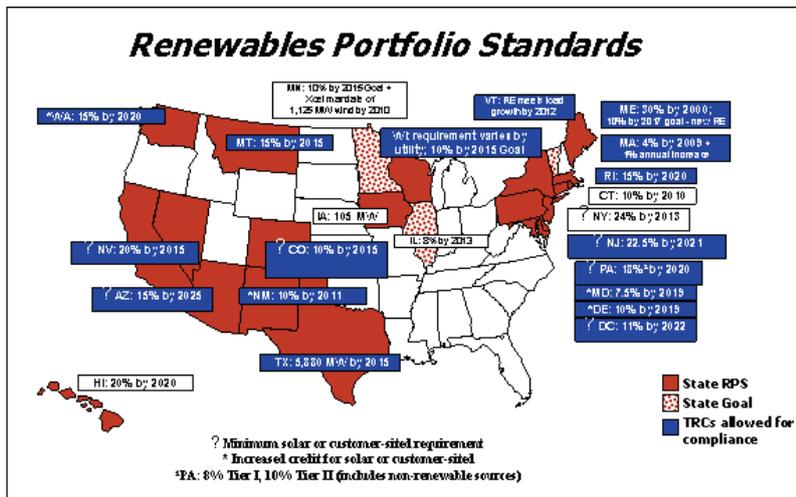


Figure 1: Renewable Portfolio Standards Using or Allowing TRCs

sparked a series of national stakeholder meetings lead by the Center for Resource Solutions, administrator of the Green-e renewable energy certification program.

In 2002, the Green-e program formally adopted a certification standard for retail products based on renewable attributes unbundled from electricity, which were called **Tradable Renewable Certificate** (TRC), now synonymous with "Green Tags", "Green Tickets", and "Renewable Energy Certificates" (RECs), all equal to one MWh of renewable generation.

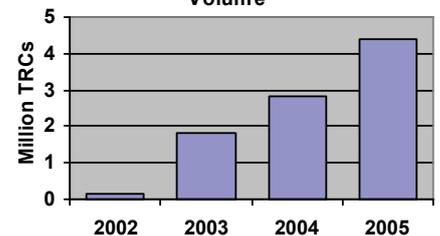
Two markets

Today, two distinct markets for TRCs exist in the United States: the compliance market and the voluntary market. These markets can be further sub-divided along geographic, resource and vintage lines, and are driven to a large extent by supply and demand around specific state compliance markets.

RPS programs

According to the North Carolina State University's Database of State Incentives for Renewables and Efficiency (www.dsireusa.org), eighteen of the twenty-nine states and municipalities that have established RPS programs currently allow the use of TRCs to meet these mandates (www.dsireusa.org/summarytables/reg1.cfm?&CurrentPageID=7&EE=1&RE=1) (see Figure 1). Thirteen states have a certificate-based RPS compliance mechanism (ME, MA, CT, RI, NV, AZ, WI, NJ, PA, MD, TX, CO, DC) and the five remaining states (CA, MN, NM, MT, IL) are likely to utilize TRCs once a regional tracking system is operational.

Figure 2: Green-e Retail TRC Volume



This significant growth trend is confirmed by NREL numbers, including some non-certified data, measured close to a twenty-six fold increase during the same time period.

Certified Green-e TRC sales information, reported in the annual Green-e verification reports, contains all sales, both wholesale and retail, of certified TRCs. Some wholesale transactions may include TRC transactions that are eventually bundled with electricity and

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Renewable Energy Certificate Markets in the United States

Customer Class	Volume (MWh) in year:			
	2002	2003	2004	2005
Residential	8,600	8,000	7,000	10,000
Non-residential	68,000	332,000	756,000	1,501,000
Wholesale	73,000	1,494,500	2,058,000	2,887,000
Total	149,600	1,834,500	2,821,000	4,398,000

Table 1: Green-e Certified TRC Sales

(Continued from page 7)

sold by Utility Green Pricing Programs and competitive electricity suppliers.

Table 1 contains a summary of these numbers, confirming the overall voluntary market trend and highlighting the significant and increasing volume of TRCs purchased by non-residential customers.

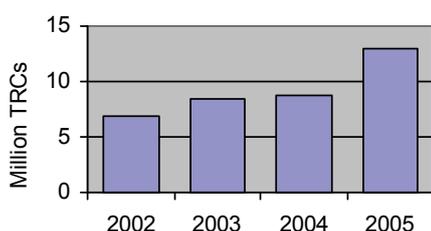
Compliance Markets

TRC volumes in compliance markets are accessible via on-line certificate tracking systems that have been established regionally for the main purpose of tracking compliance with mandatory programs such as RPS. According to 2005 data, trends in the three mature tracking systems show significant and steady year-to-year increases in renewable generation, except for a small drop in Wisconsin from 2004 to 2005.

Relative comparisons between these tracking systems are difficult because of regional variations in resource definitions and the different purposes for which they were established. In 2005, total volume in these three systems alone was 18.7 million MWh. This number does not account for compliance markets that do not utilize electronic certificate tracking systems.

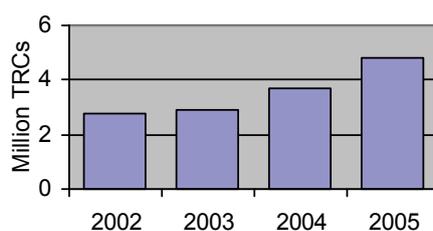
The New England Generation Information System (NEGIS) has tracked all generation since 2002. Figure 3 shows the steady growth of renewable TRC markets in that region, peaking at over 12 million certificates in 2005 (all data from www.nepoolgis.com).

Figure 3: NEGIS TRC Volume



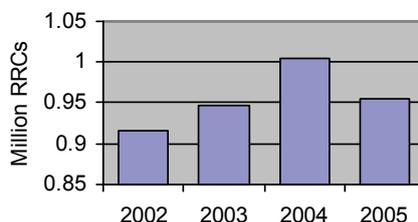
The Electric Reliability Council of Texas (ERCOT) has tracked TRCs in the state since 2001. Figure 4 shows the steady increase in volume of Renewables in that market, with a peak of almost 5 million certificates in 2005 (all data from www.texasrenewables.com/reports.htm).

Figure 4: ERCOT TRC Volume



Wisconsin's tracking program (WIRRC) began in 2001 and tracks Renewable Resource Credits (RRCs). Figure 5 shows the trends in the state specific and compliance only market, peaking in 2004 at just over one million certificates (all data from <https://www.wirrc.com/trc/index.html>).

Figure 5: WI RRC Volume



In addition to NEGIS, ERCOT, and WIRRC, the PJM-GATS EIS (www.pjm-eis.com) came on-line in 2006 and covers Pennsylvania, New Jersey, and Maryland, and the New Jersey Solar Only-SREC program (www.njcep.com/srec) started operation in 2004.

The Western Renewable Energy Generation Information System (WREGIS), which will include all eleven western states, two Canadian provinces and northern Mexico, is set to come on-line in June 2007 (www.westgov.org/wieb/wregis). States in the Midwest are also

working on a system called M-RETS to track TRCs in that region, including the Canadian province of Manitoba set to come on-line in July 2007 (MRETS — The Midwest Renewable Energy Tracking System — at www.mrets.net).

Price Estimates

Pricing information is both difficult to compile because of lack of market transparency and varies widely based on volume, market segment, geographic region and resource type. In a recent survey of TRC marketers participating in the Green-e certification program, retail prices for a single TRC ranged from \$5 for wind to \$50 for solar. Estimates from NREL point to retail prices for TRCs in the voluntary market in the range from \$15-20 for wind to \$200 for solar TRCs (Holt & Bird (2005): Emerging Markets for Renewable Energy Certificates: Opportunities and Challenges: NREL/TP-620-37388—www.nrel.gov/docs/fy05osti/37388.pdf p32).

Wholesale prices are generally lower and highly dependent on technology and location. For example, wholesale prices for wind TRCs in the West are \$1.25 per TRC while wind TRCs in NEPOOL demand upwards of \$35. Similarly, biomass resources sell for \$1.50 in California, but over \$3.50 in the Southeast, PJM and New York regions and \$45 in NEPOOL (ibid, p33).

The high prices in New England are a direct result of the compliance markets and lack of local renewable generation, leading to high demand and low supply for both major market segments.

Prices in the compliance market also show a large variance ranging from less than \$1 in Maryland to over \$250 in New Jersey (all data based on 2005 price information from Evolution Markets Inc, at www.evomarkets.com/evoid). Supply and demand is the strongest driver for this price disparity but variation is also strongly dependent on geography, volume, market segment, type of resource, vintage of the certificate, and penalties for non-compliance with any associated RPS.

With so much price variation, it is difficult to estimate the total market size, but the NREL Energy Analysis Office compiled some estimates for 2005 and projections for 2010, shown in the Table 4.

Labels and Certification

TRC product certification has been important during the past few years because TRCs are so intangible, and marketing could easily be abused to the detriment of public confidence. Product certification is different from the verification of data on which a TRC is based, but the two are related. Certification provides assurance to consumers making voluntary TRC pur-

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Renewable Energy Certificate Markets in the United States

Fuel Type	TRC Type	Location	Price
New Wind	Voluntary	National	\$3.00
New Geothermal	Voluntary	CA	\$2.25
New	Compliance	MA	\$55.00
	Compliance	Texas	\$6.00
Class II	Compliance	CT	\$0.70
	Compliance	NJ	\$2.75
Solar	Compliance	NJ	\$265.00

Table 3: 2005 TRC Price Samples

Market Segment	2005 TRC Market Size <i>(Million MWhs)</i>	2005 TRC Market Value <i>(\$ Millions)</i>	2010 TRC Market Size <i>(Million MWhs)</i>	2010 TRC Market Value <i>(\$ Millions)</i>
Compliance Market	8-13	\$140	45	\$600
Voluntary Market	5-7	\$50 - \$75	20	\$100 - 300
Total	13-20	\$190 - 215	65	\$700 - 900

Table 4: Current and Projected Market Value Estimates

(Continued from page 8)

chases that a supplier's claims are accurate and that the product meets minimum standards for quality. In addition, certification can ensure that TRCs are not being double counted such as a single TRC being used for compliance with a state mandate and sold into the voluntary market.

Verification is an added benefit to certification in that products are subject to an ex-post sales audit, to ensure that sales are backed by at least an equal supply of TRCs that meet the claimed product specifications.

Certifying organizations may rely on TRC tracking systems to simplify the job of verifying the type and quantity of TRCs supplied, but do not replace the sales audit that ensures purchases of verified TRCs match sales to consumers.

Certification has bolstered the voluntary TRC market's credibility to the point that certified TRC products are often specified by commercial and institutional buyers and in purchasing specifications used by the government and

other leading organizations. In the United States, TRC sales in the voluntary market are covered by two organizations offering product certification.

The **Center for Resource Solution's (CRS) Green-e TRC Standard** is the most widely used in the United States. Green-e TRCs include all environmental attributes associated with a MWh of renewable generation. In 2005, 28 TRC products were Green-e certified, accounting for sales of more than 4.3 million MWh of renewables. Green-e certification is available for TRC products that meet both environmental and consumer protection standards. Green-e's annual verification process audit ensures that supply meets sales and a biannual marketing compliance review ensures that suppliers are accurately marketing their products.

The second organization offering certification services is the **Environmental Resources Trust (ERT)** (www.ert.net). ERT defines a TRC differently, stating that it is only a record of the claim of energy generation placed into the grid and does not necessarily include any environmental attributes. **ERT's EcoPower label** is available to renewable electricity products and TRC products. For consumer protection, ERT will verify the environmental attributes of energy or TRCs in the product, including, if desired, a calculation of the specific emissions savings that resulted from the power associated with the TRCs. In addition, ERT will conduct a post-sale audit to verify supply and demand are in balance.

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2007 : EVENTS

FORTHCOMING GENERAL MEETINGS	
07-08 June	Stockholm
11-12 September	Lausanne
December	<i>Not yet finalised</i>