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## AIB article in ICER chronicle



**AIB**

association of issuing bodies

## NEWSLETTER 24

Vol 8 | Issue 2 | 26 Nov 2015

## SYNOPSIS OF ARTICLES

### Next generation of GOs

The AIB supports the reliable operation of electricity energy source disclosure in Europe, to protect the interests of electricity consumers. Hence we support the Commission's wish to empower consumers by giving them more choice, greater energy security and reduced carbon emissions, and hope the revised Renewables Directive promotes the use of GOs to support disclosure of the source of all consumed electricity, and to identify carbon emissions associated with the supplied electricity.

### Joint paper AIB, market parties and consumer organisations

To support its work developing the next generation of GOs, AIB is joining together with other like-minded associations to champion the need for energy choice, carbon emissions transparency, and accurate and comprehensive disclosure.

### Energy Union

Since February 2015 long-established objectives of EU energy policy get more tractive power. Read more about this fundamental transformation of Europe's energy system.

### Corporate demand for renewable electricity

The growth in the GO certificate market shows the increased corporate demand for renewable energy. Follow this from the perspective of an energy supplier.

### Working on a new Hub

In order to facilitate the international exchange of energy certificates, the AIB operates an inter-registry telecommunications Hub. The new AIB Hub will be designed to handle a huge increase in transfer activity. The security will be updated to the latest standards.

### Interview with RE-DISS

A decade of IEE funded research ends. All E-TRACK and RE-DISS projects set the basis for a reliable continuation of the calculation of the European Attribute Mix and of the national Residual Mixes and the monitoring of national implementation of GO and disclosure systems.

### Belgium – Bruges – VREG

The AIB as an umbrella organisation of Europe's Issuing Bodies regularly meets in turns at the members home countries. In September we were lucky to be invited to Bruges by the Flemish Regulator VREG.

### Netherlands – Arnhem – CertiQ

Host for the final General Meeting in 2015 will be CertiQ, a daughter company of TenneT. The meeting will take place in Arnhem, which is also the energy capital of the Netherlands.

### CEER Workshop 19 June

This successful event brought together customers and companies interested in sustainability and in buying “green” electricity, along with the European Commission, customer representative bodies, regulators and Issuing Bodies.

### EUROPEX environmental working group

Issuing Bodies (=members of the AIB) were invited to join the regular meeting of the Europex Environmental market work group.

### Statistics

The latest activity statistics, showing continued growth in the market and the effect of the introduction of new members.

# Next Generation Guarantees of Origin

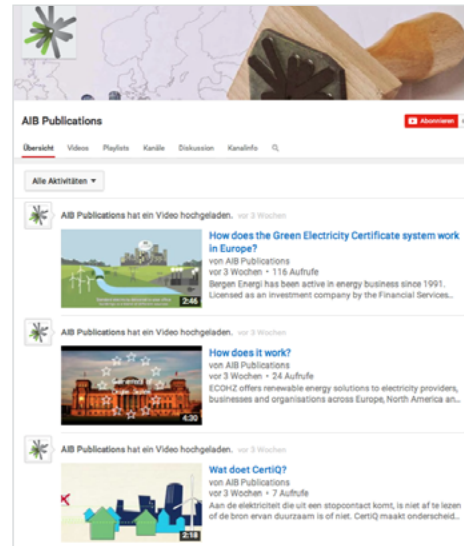
by Markus Klimscheffskij

As you may have seen, in the spring of 2015, the members of the AIB put their heads together and asked themselves: What do we want from the RES Directive revision with regard to the Guarantees of Origin and Electricity Disclosure? This clash of heads resulted in a [Reflection Paper](#), the main points of which you can also watch on a [video](#). This work has been followed up by a joint effort by AIB and other stakeholders to form a unified statement to drive forward the key points (As presented in the following article in this Newsletter). All of that is excellent! But...what's left for me to write here?

Don't worry, I won't repeat the Reflection Paper word-by-word. This will be a much softer read. Being asked to write about the Reflection Paper in the AIB Newsletter, I thought I would use the opportunity to explain what the paper is and why, and in a much freer format.

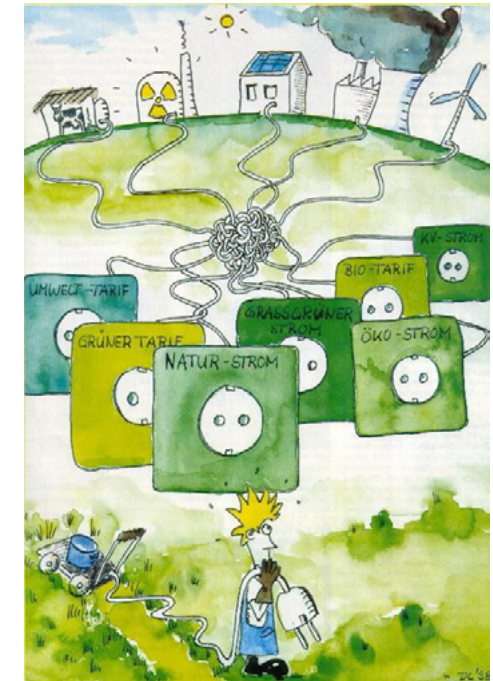
Guarantees of Origin (GOs) are a wonderful mechanism, because they allow you to "own" a certain type of electricity without actually building a windmill yourself or making a direct line from your house to an existing power plant (to understand, see [video](#) from Bergen energy, a [video](#) from EcoHz

or a [video](#) from CertiQ). This is a task they already fulfil well. Indeed, when it comes to tracking of renewable energy sources, Guarantees of Origin and especially EECs format GOs are the weapon of choice. BUT, we need to go further! The following explains why and what improvements are needed to bring the GOs to the next level and how they can have a bigger and longer-lasting impact on the renewable energy scheme of Europe.



## Full-disclosure

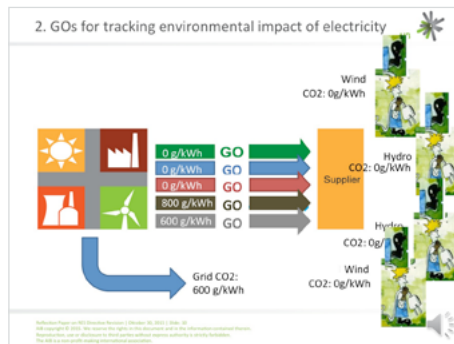
Full-disclosure means that all electricity disclosure would be done by means of GOs, also relating to nuclear and fossil sources; or as a softer option that at least all electricity generation would automatically receive a GO. So, why not focus on just renewables? Why do we have to bring all energy sources under the scope of GOs? Let's say you're a school teacher. After a test, would you only tell the students who have got an A or B what their score was? No, you want the lazy ones to know how bad they are doing for them to pick up the pace and start paying attention. Of course this already happens to some extent through the residual mix (or similar mix as may be used depending on the country) being disclosed to "bad pupils". But is it really enough that 85 % of electricity consumers know that they are doing **about average**? That they receive a D minus? If you ask me, everyone should know precisely what they get in order to instigate a change among the E and F consumers. Only a system that actively discloses to all consumers what they consume will not allow them to hide behind the excuse that they are doing **about average**. Only then the system will lead to a renewable energy policy driven by the whole European population!



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## >> Carbon

Everyone talks about carbon these days...like full-disclosure, it's becoming a buzzword for GOs. Why is it that we need to mix GOs and CO<sub>2</sub>? Well, to start with, CO<sub>2</sub> and radioactive waste content of electricity need to be disclosed to consumers under Directive 2009/72/EC, Art.3(9). And since GOs are the mechanism of choice for this, electricity disclosure, they really ought to deliver reliable tracking and disclosure of carbon and radioactive waste as well as the energy source! The current problem is, that if this is not regulated, companies will use their own values to determine the CO<sub>2</sub> content of a specific GO. They need to do this on their own, because a situation where 1) GOs and carbon would be separately tracked or where 2) carbon content of electricity would always equal the grid mix regardless of the choice of energy origin, would lead to an obscure system where a consumer might purchase wind power, but be disclosed with the carbon content of lignite. To regulate disclosure of carbon, we should put it on the GO.



Ah, yes the technicalities...The renewed Greenhouse Gas Protocol [Scope 2 Guidance](#) has gone a long way in solving technical issues between energy tracking certificates (e.g. GOs) and carbon accounting. We no longer have to argue about whether to use onsite or life-cycle emission data for GOs, because of the Scope-based thinking of the protocol. Scope 2 emissions relating to electricity use should only relate to onsite emissions, because non-direct emissions are counted under Scope 1. Furthermore, it becomes obvious that all GHG emissions should be included and therefore CO<sub>2</sub>-equivalents used. Since the GHG Protocol is so widely used by the industry, many of the technical questions have already been solved for us!

The carbon discussion is also heavily linked with additionality. Will consumption of zero CO<sub>2</sub> power lead to more new-build? And if not, what's the point? This is the same as asking a broader question: is there a point in the GO system without additionality: Is additionality a requirement of the GO system? I talk more about additionality in the end of the article, but as a short answer, YES it is! What would be the point of a renewable energy policy, if it didn't lead to a better environment? BUT, a direct cause and effect measurement for a policy instrument such as GO is nearly impossible. Apart from future contracts, the plant is always already in place once we get to the part where GOs are sold for its production. Especially the social value of GOs, which gives a voice to people in the promotion of renewable energy, is a very fluid thing to measure.

This is true for any individual action towards a better environment: choosing a train over a plane, falafel over a steak or a fair-trade banana over a regular banana isn't going to lead to an improvement as a single act! The same amount of planes still take off, cows are bred and regular bananas are cultivated. It's the actions of the masses that matter and make coal-fired power plants shut down; individual actions don't have a quantifiable effect!

### Double Perception

The GO system is tough to understand, but the good news is that consumers don't really need to know all the details. I mean, how many of you can honestly say you understand the whole monetary system? Or how a smartphone works? I don't, but with what I do know, I'm able to trust that my money is usable and secure, and that I can speak to my friends. So, consumers don't actually have to know about the Hubcom or the Fact Sheets, they just need to trust that disclosure information on their bill is true. Now that's a tough challenge. How can we make a consumer trust the bill with a disclosure mix containing a high-share of nuclear energy when the consumer knows that no nuclear energy, only renewable electricity, is produced in the country? When we talk about double perception, we mean that although the consumer is presented with the correct disclosure information, he still perceives his electricity being produced from the plants near to him. This is a common problem throughout Europe.

To address double perception, we need communication at a European-level as well as easy to understand disclosure information accompanied with required explanations. It is especially important not to confuse consumers with a production mix of any sort in disclosure or marketing material, because this is very likely to lead to double perception. Ideally, the appearance of disclosure information should be harmonized in Europe. Also, the consumers should be taught the very basics of the GO system so that they do not get stuck in the physical reality (read the [article](#) from Dirk van Evercooren in the European Energy Review). This shouldn't be too alien, since e.g. a German consumer can already now live in Munich but buy power from a supplier in Berlin, which has nothing to do with the power physically supplied to him.

### One Directive, Harmonized Rules

Finally, GOs and disclosure belong together. There's no real reason why GOs and electricity disclosure should be two separate systems set out in two different Directives, because the sole purpose of GOs is **disclosure as meant by 2009/72/EC, Art.3(9)**. The only actual reason for the separation is historical: for a long time, the foreseen role of GOs was that they should be used to enable national RE targets to be monitored. It was not until 2009 – with the passage into law of the Renewable Energy Directive – that the role of GOs was agreed to be for disclosure, and for disclosure alone. While it's quite understandable that the linkage between

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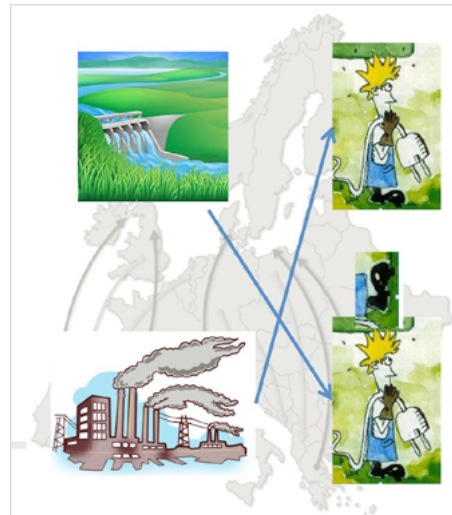
>> GOs and disclosure is not as strong as it could be, we know better today: today we should strive for an integrated GO and Disclosure system set out in a single directive.

The lack of guidelines for disclosure has led to a widespread set of different practices across Member States. Most notable examples include: different timeframes and eligibility of GOs for disclosure in a specific year, look of the disclosure information, concept of individual electricity products versus the whole supplier mix, as well as issuance (or non-issuance) of GOs for supported production and energy sources besides RES. The Reliable Disclosure Systems for Europe (RE-DISS) project developed a set of best practices to address these questions, and CEER has also published its own guideline, very much in line with RE-DISS. It's time we set the principles of these best practices into law to avoid differing rules, and to foster market growth and reliability of electricity disclosure.

### Labels and Additionality

I promised to return to additionality in the end of the article... Additionality is often perceived as a curse-word of some sort, and very understandably so. To be philosophical, additionality is always simultaneously everywhere and nowhere. Like I said, measuring a direct cause and effect of market mechanisms is often more challenging than building the damn' windmill yourself. Adding carbon into the GO is a good start, because reliable tracking of CO<sub>2</sub> is likely to increase GOs' value

and credibility, but to speed up the process, this is a **call for help to environmental organizations and consumer organizations: Please help the electricity suppliers by creating your own GO products with direct and measurable environmental benefit to complement the basic GO system!** AIB can't do this, but you can! Especially related to carbon, consumers should understand that all zero-carbon power is not equally good. Labels with extra criteria are needed to easily distinguish which GOs carry a higher environmental benefit, which may result from e.g. age of the plant, guaranteed investment into new-build, climate programs etc...To support additionality, labels can also endorse e.g. long-term purchase contracts, transparent market prices as well as easy and objective differentiation of environmental value of different GOs. Furthermore,



they should communicate that zero-carbon power should not compete with energy savings measures or direct own investments in renewable capacity where this is possible. Such concerns are also addressed in the Greenhouse Gas Protocol. All in all, we have a great factual mechanism – the GO – as the backbone of the consumer-driven renewable energy support scheme called electricity disclosure. It's time we put some meat on the bones and make easily understandable environmental+ products. We need your help: please tell us that you can and will provide it.

### In summary...

We all want additionality and for the RES policies to have an effect! That's not the issue. The question is more about whether we trust that the GO system and power labels are the best way to achieve it. Trust is the key word because we really can't say that buying renewable power directly leads to more renewable power, just as we can't say that for fair-trade products either; because we're almost always buying ready-made goods, and not goods specifically produced for us. It's not the money itself that makes banana farmers behave fairly, it's the demonstration of these values by the people, which is shown in a higher price. That's just how it works, and this is very much a reality in the GO world. Even more so, because much of this impact is actually social! When government sees the importance of renewable power to people, it will have an impact on its decisions, which contributes to additionality along with the direct monetary

gain for RES producers from selling GOs. New labels can also bring us forward a great deal and that's why I actively called out to NGOs and consumer organizations! If you prefer one GO over another, then mark the good stuff with your mark and communicate this to people! The nature of GOs is that when no one wants the bad stuff anymore, well then it's no longer produced. As AIB, we should in return be open to discuss different concerns and agree commonly how these can be met. In the end we must also be willing to critically assess whether the trust we put on GOs is justified.

At least currently I think it is very much so, because GOs bring the decision making at grass-root level (YOU are responsible for the power you buy!) and furthermore, they do so reliably and efficiently. That means every consumer in Europe is an active factor in the transition of the European Energy System! With the changes proposed in the Reflection Paper we have the possibility to increase this factor manifold. It's like we're on a freeway and accelerating with a coal fired steam-engine. It's slow, but we're getting there...Here we have the opportunity to change the steam-engine into a Tesla and put the consumer on the driver's seat!



# Joint call for disclosure of all sources of electricity and derived carbon emissions in the forthcoming Renewables Directive

When we talk about renewable energy, we must make one thing absolutely clear: the consumer is in the driving seat. Consumers no longer consider energy a commodity but they distinguish between the individual products which have different origins, impacts and prices. Consumers are taking responsibility for their choice of energy and they demand more product choices and improved information about the products chosen.

One of the achievements of the current Directive on renewable energy is the availability of information about the origin of energy, which provides useful consumer information. Now we are on the verge of a new Renewables Directive. The direction of the EC is clear: a wider choice of action for consumers – large and small.

If we elaborate upon the current guarantee of origin (GO) system, the AIB can help facilitate a wider choice of action to the benefit of consumers when purchasing energy. The AIB does not intend to do this on its own but, by approaching market parties, NGOs and large consumer initiatives, we encourage these parties to initiate a dialogue with the purpose of finding solutions to some important questions:

1. How to help propagate the unambiguous cohesion between the origin of the energy and the environmental impact of the energy we purchase and consume. So that customers all over Europe can be informed unambiguously about the carbon emissions derived from their energy consumption.

2. GOs must be used for disclosure exclusively. It is crucial for the consumers to have confidence in the claims that suppliers make regarding the energy they supply. If this is common practice for food, clothing and other consumer goods, then why shouldn't it apply to energy? Through 'full disclosure', encompassing all fuel sources and technologies, all energy supply can be verifiable through GOs. Therefore the link between Guarantees of Origin and disclosure needs to be strengthened in the Directive.

We have learned that other associations share our view on these issues. So now we are teaming up with like-minded associations to bring across our message "that a new Renewables Directive needs to take transparency and consumer empowerment to the next level".

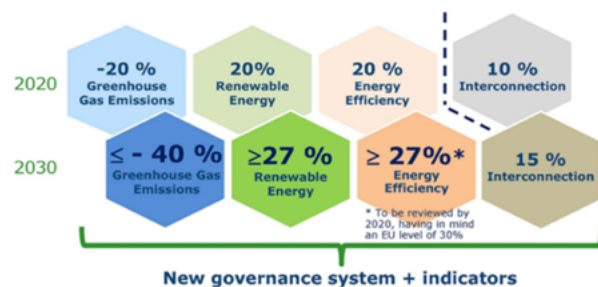
# In the light of the Energy Union

On 25th February 2015, the European Commission published a Communication on the Energy Union Package titled: "A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy". This article presents some important facts on the Energy Union.

The Energy Union means making energy more secure, affordable and sustainable. It will allow a free flow of energy across borders, and a secure supply in every EU country, for every European. New technologies and renewed infrastructure will cut household bills and create new jobs and skills, as companies expand exports and boost growth. It will lead to a sustainable, low carbon and an environmentally friendly economy, putting Europe at the forefront of renewable energy production and the fight against global warming.

The main goals of the Energy Union are to:

- Pool resources, connect networks and unite the EU's power when negotiating with non-EU countries
- Diversify energy sources – so Europe can quickly switch to other supply channels if the financial or political cost of importing from the East becomes too high
- Help EU countries become less dependent on imported energy
- Reduce Europe's energy use by at least 27% by 2030
- Build on the EU's target of emitting at least 40% less greenhouse gas by 2030 and
- Make the EU the world number one in renewable energy, and to lead the fight against global warming.



European renewable energy businesses have a combined annual turnover of €129 billion, employing over a million people. The challenge is to retain Europe's leading role in global investment in renewable energy.

Citizens are at the core of an Energy Union. The prices they pay should be affordable and competitive. Energy should be secure and sustainable, with more competition and choice for every consumer. These and other commitments sit alongside an action plan to meet these ambitious goals in our energy and climate policy.

## Energy Union Factsheet

The European energy system faces an ever more pressing need to ensure secure, sustainable, affordable and competitive energy for all citizens. Excessive dependence on a limited number of supply sources, especially for natural gas, leaves countries vulnerable to disruption of supply. Greenhouse gas emissions and dependence on fossil fuels must be reduced. The affordability of energy and the competitiveness of energy prices are of increasing concern to households and businesses.

Persistent obstacles to real market integration, uncoordinated national policies and the absence of a common stance vis-à-vis non-EU countries all impede progress. The effective response to these challenges is a more cohesive set of measures across policy areas and at EU and national levels. The agreements on the 2030 Framework for Climate and Energy as well as on the European Energy Security Strategy in 2014 were major steps forward; and Energy Union is intended to build upon them.

The EU imports 53% of the energy it consumes, and some countries depend on a single supplier for their gas imports. Diversification of energy sources and suppliers is a key means of improving energy security. Exploring new supply regions for fuels, exploring new

technologies, further developing indigenous resources and improving infrastructure to access new sources of supply are all elements that will contribute to the increased diversification and security of Europe's energy sector.

The current challenges of the electricity market include in particular integrating variable renewable energy with the traditional, predictable and controllable sources of energy, while at the same time ensuring security of supply. Meeting these challenges will require a market design that provides for coordination of capacities at regional level, storage and more flexibility in demand response, enabling consumers to better participate in markets and simplifying the exchange of energy across borders. To this end, the Commission will provide enhanced rules for cross-border energy trade and propose appropriate measures to encourage and facilitate the integration of renewable energy producers into the wider electricity market.

The Energy Union will ensure that renewable energy is mainstreamed and fully integrated into a fully sustainable, secure and cost-efficient energy system. This will allow the EU to remain a world leader in competitive renewable energy technology and innovation, and smart and flexible energy systems and services.

For this to happen, the Commission will:

- fully implement existing legislation; and put in place new market rules in order to integrate renewable production efficiently into the market, including the development of new infrastructures, especially interconnections;
- facilitate cooperation and the convergence of national renewable energy policies and support schemes in line with the development of the internal market, and in particular the new electricity market design, which will ensure fair competition between all generation sources as well as demand, and lead to the opening of more cross-border support of renewables;



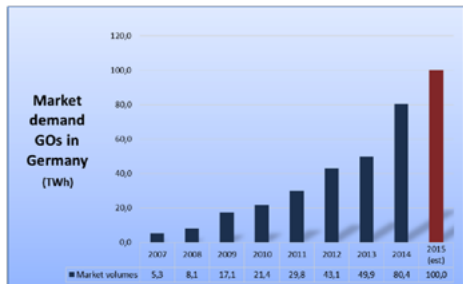


# Corporate demand for renewable electricity

Globally, energy production and consumption is responsible for 40% of the total greenhouse gas (GHG) emissions. For the global community to succeed in curbing GHG emissions, a rapid transition away from fossil-based generation to more renewable sources is the single most important objective. And things are looking up. AIB's latest quarterly figures on the Guarantee of Origin certificate market show that the demand for renewable electricity in Europe continues to grow in 2015. Germany is driving the demand for renewable electricity in Europe. Behind this growth is an increased corporate demand for renewable energy.

The European demand for renewable electricity documented by Guarantees of Origin now constitutes more than 10% of all electricity consumption in Europe (ca. 3300 TWh) and more than one third of all electricity from renewable sources in Europe (ca. 900 TWh).

In a European market that may reach a total market volume of 400 TWh in 2015, Germany continues to play a dominating role. In 2014, Germany reached a volume of 80 TWh, and may now be on track to



Source: Association of Issuing Bodies, 2015

reach an impressive volume of 100 TWh in 2015, accounting for 25% of the European volume. The German figures as of Q2 in 2015 already show a market demand of 69 TWh, an increase of 11 TWh, 19% higher than the 2nd quarter last year. Germany, having a total power consumption of 580 TWh, is now close to having 20% of all consumption documented as renewable. Note that the German figures are somewhat understated for the years 2007 to 2013, due to the existence of a national system of renewable certificates that were not included in the figures of the AIB.

Behind this growth is an increased corporate demand for renewable energy. Thousands of businesses are voluntarily buying renewable electricity with Guarantees of Origin.

This drive comes partly from EU Directives, national legislation and international goals, such as the recently adopted Sustainable Development Goals (SDGs). SDG 7.2 calls for an increased share of renewable energy in the global energy mix by 2030. The increase in global recognition, public commitment and private demand for renewable energy correlates to the scope, severity and speed at which climate change is affecting the planet and all businesses.

In addition to Directives and legislation, we saw a strong and cohesive renewable movement come to life in 2014. Businesses around the world grew tired of waiting for government guidance, and decided to act themselves. New alliances and networks with

corporate members started to drive the demand for renewable energy. One very exciting example is RE100, an impressive initiative brought about by the Climate Group and CDP. Their target is to have 100 of the world's largest companies commit to 100% renewable power by 2020. Another example is the US-based initiative Corporate Renewable Energy Buyers Principle spearheaded by WWF and World Resource Institute (WRI). It has already brought 19 multinationals together to demand improved ways of purchasing renewable energy. Community pressure has also accelerated businesses' commitment to renewable energy.

Beyond legislation and public pressure, renewable energy makes business sense for the companies that want to remain relevant in tomorrow's market. Companies want to use renewable energy, reduce their energy consumption and bring more renewable energy to the grid. In short, committing to renewable energy is important not only for their sustainability agenda, but also for their corporate agenda. For example, Google is striving to power its company with 100% renewable energy up from its current 35%. This year, Google and Apple have said that they will be increasing their commitment to renewable energy. It makes business sense to use electricity from renewable energy sources.

In order to achieve this, corporations are demanding transparency and documentation all around the world. They are demanding trustworthy systems such as Guarantees of Origin in Europe, REC in the US and I-REC in selected Asian countries.

Corporations also appreciate that the world needs more sources of renewable energy. H&M for example is committed to 100% renewable energy in markets where it is available, but they also want to contribute to building new more renewable capacity sources. In April, H&M committed to buy Green-e certified RECs in North America, Guarantees of Origin (GO) and ECOZH GO<sup>2</sup> in Europe to ensure that its stores, warehouses and offices use an increased amount of renewable electricity while bringing more renewable electricity to the grid. In short, H&M will adopt the ECOZH GO<sup>2</sup>, a solution that both ensures documented renewable electricity and contributes to building new production resources for renewable electricity. H&M is the first company to buy ECOZH GO<sup>2</sup>, bringing crucial top financing to a new small hydro plant in Norway.

So while leaders and the wider global community continue to shape the renewable energy agenda, business leadership are embracing the change and making it a reality. Corporations that are changing their energy behaviour are setting the standard for others to follow. Engaging the corporate sector will accelerate the change we need to see. It is one of the most critical issues on the broader climate change agenda.

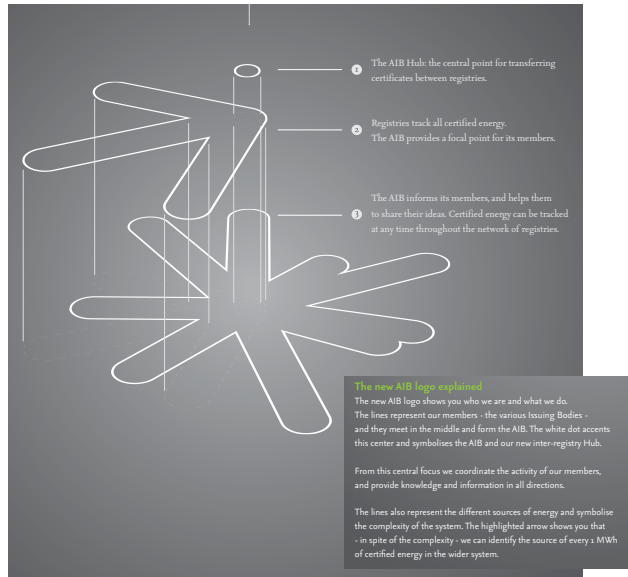


by Tom Lindberg, who is the Managing Director of ECOZH, a leading supplier of a wide range of renewable energy solutions to electricity providers, businesses and organisations across Europe, North America and Asia. The company also provides an innovative solution – GO<sup>2</sup> – combining renewable energy purchases with the financing and building of new renewable power generation.



# The new AIB Hub – preparing for the future

“With a growing number of members and traded volumes showing steady increase, the AIB is investing in the future and setting up the next generation AIB Hub.”  
Lars Olav Fosse, AIB Board



In order to facilitate the international exchange of energy certificates, the AIB operates an inter-registry telecommunications Hub. Since the launch of the current AIB Hub, the traded volumes through the AIB Hub are expected to have nearly doubled their 2011 volumes by the end of 2016. At the same time, the market expects the AIB to provide a 24/7 secure and accurate service. This made it paramount to develop the next generation AIB Hub.

## Setting up the tender project

Even though AIB draws its members from giants like Swissgrid, Powernext and Statnett, the AIB Secretariat does not have expertise in all specialist areas. This particularly applies to procurement within

Belgium, as the AIB is an AiSBL under Belgian law, and this is a country with complex tendering procedures. This called for external assistance. With Roelf van Dam of Minolo BV, Netherlands, as an external project manager, and legal assistance from Stefan van Camp of Time.lex of Belgium, the AIB began the process of finding the next AIB Hub provider. I was asked by the rest of the AIB Board to be the project owner on behalf of the AIB.

The tender project ran from January until June. We followed a negotiated procedure where companies were first invited to show their interest in tendering and then, through a prequalification procedure including both assessment of documents and interviews, five companies were invited to the second round, where they submitted their tender proposals.

It was important to strictly follow objective criteria in the evaluation of the tenders, mainly to end up with the best possible candidate, but also to avoid any legal claims against the AIB. At best, this would have slowed down the project. As the contract with the current AIB Hub provider expires in March 2016, we had no time to lose. The most economically advantageous offer in terms of the criteria stated in the specification, invitation to tender and descriptive documents would be chosen.

In the end, **UNICORN** Systems had the highest score on the selected criteria, and offered an advantageous price as well. On July 29, it was announced that Unicorn Systems had been awarded the contract to develop, maintain and host the new AIB Hub; and it was time to start the IT phase of the project.

## Developing the AIB Hub for the future

Shortly after the contract had been awarded, a new project organization was set up, this time for the systems development part of the project. Marcel den Besten of EnGarde Consulting took over

as project manager, and Annie Desaulniers, one of the co-chairs of the Working Group Systems in the AIB, took over as project owner.

The team immediately had a start-up meeting with Unicorn, and has had regular meetings to make sure we met the project delivery timeframe. The initial plan has so far been followed, achieving its targets for both time and cost. At the time of writing, user acceptance testing and testing of the connection to the new AIB Hub is being organised. If all continues according to plan, we will switch to the new AIB Hub later this year.

## Improved security and service

The new AIB Hub will be re-build from scratch using new technology. However, business rules will now be included according to the EECS Factsheets, and operations will not be affected. The technical design will be more modular to allow for easy future changes and extensions. The new AIB Hub will be designed to handle a huge increase in transfer activity. The security will be updated to the latest standards. A well-planned transition phase from the old to the new AIB Hub secures that there will not be any interruption in service, except for a short stoppage during the actual transition.

The AIB is confident that the new AIB Hub will prepare the European GO market for the future.



# The RE-DISS project has ended – but found a way of continuation

WGEA: The EU funded RE-DISS project ended in September, but it was not only a 2.5 year project, it had some predecessors. Could you tell us about the development since 2005?

**Dominik Seebach:** The first project of the kind, E-TRACK, was launched in 2005. It was motivated by the development of disconnected and diversified national systems of guarantees of origin (GO) across Europe. At the same time, trading of GOs started to gain importance and the need for a harmonised tracking system for electricity enabling cross border exchanges of GOs in Europe was growing proportionally. As a technical system, this was being developed by the AIB with the EECS standard. In this context, it was also necessary to put in place practices to account for the traded electricity, which would guarantee that double counting of green attributes was avoided. The E-TRACK project, coordinated by Christof Timpe, designed the E-TRACK standard, which consisted of two main elements: a standardised GO system which could be extended to other energy sources than renewables, and which could also be applied to electricity produced under cogeneration mode; and the so-called Residual Mix (RM), which is to be used by electricity suppliers for the electricity that they supply without a GO. A generic methodology was put forward for its calculation.

In the follow-up project, E-TRACK II, which started in 2007, the project team continued the monitoring of the different tracking systems used in all European countries and the team issued general recommendations as to how the tracking systems should be organised. It also enhanced the E-TRACK standard through additional recommendations and the invention of the concept of European Attribute Mix, designed to balance the deficits or excess in available attributes exchanged between European Domains. While this approach has been developed from a methodological point of view, it was beyond the scope of this project to find a way of organising the calculations of the national Residual Mixes on a common time schedule and a harmonised methodology in practice. As it was uncertain whether an application for a further EU-funded

follow-up project would be successful, RECS International and the AIB tentatively established the European Platform for Electricity Disclosure (EPED).

In the end, the first phase of the RE-DISS project was launched in 2010 to provide the centrally-organised RM calculations, and produced values for the RM for the years 2009 to 2012. RE-DISS, after intensive consultations with Competent Authorities for GO and Disclosure, also drafted the first version of the RE-DISS Best Practice Recommendation (BPR) document, a set of commonly agreed recommendations on GOs and Disclosure, which, if applied, should guarantee that accurate and reliable information is supplied to end consumers on their electricity disclosure statements.



With RE-DISS II, which I enjoyed coordinating, the project team fine-tuned the methodology of calculating residual mixes and produced results for 2013 and 2014. One of the challenges of this second phase was – with the ever growing volumes of international transactions – to provide a methodology and information that would enable Competent Bodies to assess the quality of GOs coming from abroad. With the help of the Competent Bodies, the project team elaborated criteria to ensure the reliability, accuracy and veracity of GOs, and analysed which information would be needed to assess whether these criteria would be fulfilled. The team collected this information for all European Domains, and Competent Bodies now have to hand all information necessary to make their own decisions.

WGEA: RE-DISS invited all interested stakeholders to its final event in Bruges, Belgium on 23 September. What were the most important and fruitful outcomes?

**DS:** First, I would like to warmly thank VREG for its kind hosting of the final event. VREG was always very much involved in this project; they even used to be member of the E-TRACK project team!

This conference was important because it demonstrated that RE-DISS II has accomplished a lot – thanks to the three preceding projects. Competent bodies can now refer to guidelines, methodology documents, recommendations, background analyses and best practice overviews, that were elaborated jointly thanks to the feedback and lessons learnt through previous projects, and thanks to the continuous participation of many stakeholders. The final event also enabled me to extend my thanks to all of them. It also showed that these stakeholders (European Commission, Competent Authorities, market players, electricity suppliers, NGOs...) share a common requirement in demonstrating that the disclosure systems put in place are trustworthy, which is to the benefit of the consumer!

WGEA: Several core tasks were done by the project teams during the past ten years. In which way will RE-DISS and these tasks be continued?

**DS:** In the RE-DISS II project, the focus was also on organising the RE-DISS legacy so that all relevant dynamics and routines established throughout these years would not terminate, but continue with the same level of quality. The AIB has volunteered to take over two of the major tasks of the project: the calculation of the European Attribute Mix and the national Residual Mixes, and the monitoring of national implementation of the GO and disclosure systems. RE-DISS has prepared all documentation necessary to proceed with the tasks and the documentation will be transferred in due time. In the meantime, the AIB has also secured the services provided by our experienced project partner Grexel in order to carry out the calculations, which means that results will be as reliable as ever. The AIB members are also in a very good position to continue the monitoring of country status, since they are Competent Bodies for GOs and often also for Disclosure. I think it is a major achievement that the AIB has agreed to take on these tasks and I am very confident that AIB will achieve high quality results!

The AIB Working Group External Affairs thanks you a lot, Dominik, for this interview.

# Belgium – Flanders and Bruges – VREG

by Katrien Verwimp

## General Meeting in Bruges hosted by VREG

In September 2015, AIB's General Meeting was held in Bruges, in the Flemish part of Belgium where 60 % of the Belgian population lives. The meeting was hosted by VREG, the Flemish energy regulator, which is also the Issuing Body for the Flanders Domain and Competent Authority for disclosure in Flanders.

VREG has a long standing tradition of facilitating the discussions between market actors and system operators. Throughout the years, VREG has sharpened its focus on customer empowerment through dissemination of all information required for a deliberate choice of energy supplier: product price, quality of service and disclosure of energy sources.

Prolonging this work towards international platforms, in September 2015 VREG welcomed the AIB Working Groups and General Meeting, RE-DISS project and RECS International in Bruges by hosting a series of meetings for international stakeholders working in the field of guarantees of origin and energy disclosure, including AIB and Open Markets Committee meetings, and the RE-DISS final event.

## VREG in the AIB

VREG has a long standing relationship with the AIB. Since joining the organisation in 2006, VREG actively contributed to the work of AIB in the working groups. On top of that, with Thierry Van Craenenbroeck, VREG provided AIB with a treasurer for two

years and member of the board for four years, until 2012. Also, the AIB's registered offices have been located at the VREG's address since 2006. For the past two years, VREG has invested resources in co-chairing Working Group Systems (Katrien Verwimp), and since May 2014 VREG has provided the president of the AIB (Dirk Van Evercooren).

## VREG 's GreenCheck

Ever since the preparation of the Flemish GO system in 2003, VREG has been devoted to consumer awareness and consumer trust in the origin of green electricity. With this scope, Flanders expanded the European disclosure obligation with a tool called the GreenCheck.

In the GreenCheck module on VREG's website, every family and business in Flanders that concluded a contract for green electricity can check whether the supplier fulfils the contract and cancels the right amount of GOs to cover the supplied electricity. This is a free service provided by VREG.

The mechanism behind it involves monthly reporting by all electricity suppliers of the identifying EAN codes of each electricity consumer with a green contract, and an action on the grid operators to add the measured consumption of each of these consumers to that list. A VREG back-office tool calculates the amount of GOs to be cancelled by the supplier: the so-called GO quota. The monthly amount of GOs cancelled by supplier is then compared to the GO

quota. The process ends with passing on the outcome of this comparison to the consumer via the GreenCheck tool.

More information can be found here: in [English](#) and in [Dutch](#).

## Disclosure: VREG's Fuelmix Report

For years VREG has been publishing a disclosure report, listing the origin of the electricity by supplier. Though the information in this disclosure report is accurate and complete, it is not very accessible for consumers at the time when they decide on the choice of a new electricity supplier. GreenCheck is an interesting tool AFTER a contract with a supplier is signed. This leaves a gap for consumers looking for an electricity supplier BEFORE signing a contract, and willing to base their choice on the origin of the electricity. VREG is asked by the stakeholders to provide a solution to easily provide this information to consumers. This led to the development of the Origin Comparator tool.

## New Origin Comparator tool

In the beginning of September 2015, VREG launched a new tool on its website, which allows electricity customers to compare the origin of electricity of all active suppliers.

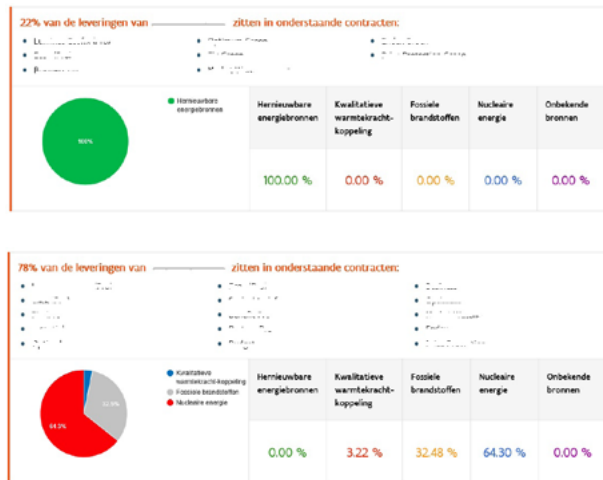
VREG launched the 'Origin Comparator' because in addition to price and service, the source of the electricity is also an important argument for choosing a specific electricity supplier.

>>

>> Customers – both households, SMEs and large corporate clients – preferring a specific type of (green) electricity or electricity generated in a particular region or country of origin, can now use reliable neutral information from the new VREG website module to make an informed choice when choosing a green electricity supplier. The information used in the Origin Comparator tool is derived directly from the annual VREG Fuelmix Disclosure Report.

**With this module, you can:**

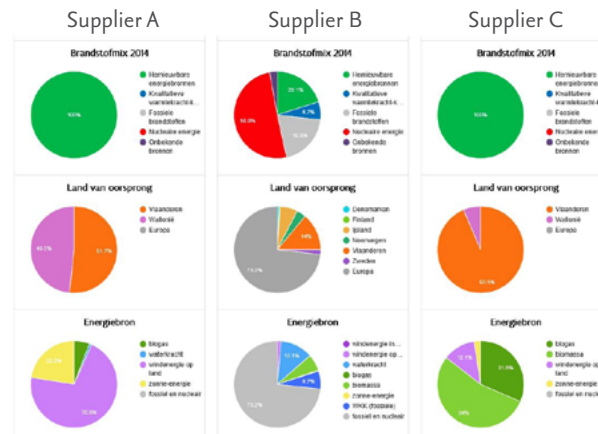
1. View the source of the electricity sold per contract (renewable, combined heat and power, fossil, nuclear) . An electricity supplier can offer more than one electricity contract. Check out the origin of each contract of one particular electricity supplier in 2014.



2. Make a comparison between up to 3 different electricity suppliers based on the origin of the electricity supplied in 2014, on these criteria:

- General fuel mix
- Country of origin
- Details of the (renewable) energy source

Graphical view of an origin comparison with 3 electricity suppliers:



You can do the comparison (in Dutch) here:

[www.vreg.be/nl/herkomst-stroom](http://www.vreg.be/nl/herkomst-stroom)

The data in the module is updated every year.

VREG is open for feedback and ideas to improve this tool on customer empowerment on the source of electricity. They are highly appreciated – please contact [katrien.verwimp@vreg.be](mailto:katrien.verwimp@vreg.be).



# The Netherlands – Arnhem – CertiQ / TenneT



## Welcome to CertiQ in Arnhem

The last AIB General Meeting in 2015 will be held in Arnhem, the Netherlands – home of TenneT and its daughter company CertiQ. As TenneT/CertiQ is one of the early members of the AIB, the link to Arnhem has always been strong. Arnhem is also the energy capital of the Netherlands. Many companies in the energy field found their origin here and are still based in this city, like DNV GL – Energy (formerly KEMA), Alliander etc.; Also TenneT has its European and Dutch headquarters in Arnhem, the MCE at Energy Business Park Arnhems Buiten\*. New initiatives and start-ups are being born here in Arnhem continuously, spurring developments like smart grids concepts etc. A nice example to illustrate the importance of electricity to Arnhem is the trolley bus. Public transportation in the urban area of Arnhem is done by trolley buses, powered with electric power. Power supply is provided through overhead lines.

## Fashion Quarter and more...

But Arnhem has much more to offer. The city is renowned for its Fashion Quarter (Modekwartier), and it houses numerous fashion ateliers in the city centre. Much of the Dutch fashion talents are fostered here – growing into artists. Arnhem, built on the banks of the Rhine, is located in the midst of spectacularly green surroundings like the Veluwe national park (host to the famous Kröller-Müller museum) and the flood plains area along the Rhine. In the city itself, you will find delightful parks and magnificent country estates. There are also

many exceptional gardens and, not to forget, the beautiful green avenues in and around the city centre, like Sonsbeek Park.

Arnhem has a rich history. The city is also famous for the Battle of Arnhem which took place in and around Arnhem from 17th to 25th September 1944 as part of Operation Market Garden.

## Guarantees of Origin in the Netherlands

Already in 1999, TenneT founded the “Energiecertificatenbank” or “Energy Certificates Bank”, but as only financial institutes were allowed to be called “bank”, the company had to change its name to “Energiecertificatenbeheer”. This is may best be translated to “Energy Certificates Services”. In 2003 with the implementation of Guarantees of Origin (GO), the organisation changed its name to CertiQ. The company carries out the task of issuing GOs and register trade including import and export plus cancellations under mandate of the Dutch Minister of Economic Affairs. In the Netherlands, GOs are issued mainly for Biomass and Wind. Due to its location, the contribution of solar and hydropower is (much) smaller. Demand for GOs has always been abundant. Approximately one third of the total electricity consumption is green, based on GOs. Demand is much higher than domestic production of Renewable Energy; therefore import is an important share of the GOs for the Dutch market.

\* CertiQ has its offices in TenneT’s headquarters Mariëndaal Centre of Excellence (MCE) at Energy Business Park Arnhems Buiten ↓

In 2014 approximately 40 TWh of green power was supplied, for which CertiQ issued GOs for 12 TWh.

Important developments of the last years in the Dutch domain are:

- The issuance of Renewable Heat GOs as of 2012
- Large industrial customers’ use GOs to demonstrate their carbon claims
- Also the increase in issuance and trade in GOs for fossil electricity – anticipated to double in 2015 to >2 TWh
- Double perception in exporting countries, leading to more demand for domestic GOs compared to foreign GOs
- Growing consumer demand for and political attention to full disclosure based on GOs

**CertiQ** is a team of twelve dedicated people. It services more than 12,000 producers representing approximately 12,500 MW (incl. co-firing biomass installations) and almost 100 traders. Also 300 end users have direct insight in the GOs that have been cancelled on their behalf by means of their end user account, a special service provided by CertiQ.

All in all, we are looking forward to welcoming members and observers in our hometown Arnhem. We are currently working enthusiastically to prepare everything to ensure fruitful meeting days for the AIB and make your stay as comfortable as possible. See you in December in Arnhem.





# Report of the CEER Workshop “Guaranteed Green”

On 19 June, the Council of European Energy Regulators (CEER) organised an EU Sustainable Energy Week event in Brussels, titled ‘Guaranteed Green’.

This event brought together customers and companies interested in sustainability and in buying “green” electricity; along with the European Commission, customer representatives, regulators and issuing bodies of “Guarantee of Origin”.

At this “Guaranteed Green” event, CEER wanted to discuss the importance of having a robust electricity disclosure system for creating a voluntary, consumer-driven market for renewables and regulators’ recent recommendations on how to make the electricity disclosure system more transparent and consistent so that customers can make decisions based on information they can trust.

The format of the workshop was a panel with four participants (AIB, industry, EC and BEUC) and it was moderated by CEER. All the presentations can be downloaded on the [CEER website](#) and it is worthwhile to have a look at them!

## Main messages from the speakers:

By way of introduction, the background and main recommendations of the [CEER Advice on Customer Information on Sources of Electricity](#) were presented by the moderator.

Philip Good, on behalf of DG ENER, then pointed out that the European Commission is indeed

planning to revise the Renewables Directive (along with the Internal Energy Market Directive and the Energy Efficiency Directive, as a global post 2020 package) to be finalised by the end of 2016, but the first half of 2017 might be more realistic, and therefore DG ENER is currently in ‘listening mode’. He stated that the EU Commission has identified several good practices that have emerged in the areas of issuance of Guarantees of Origin (GOs) and of disclosure. He singled out the development of EECS and the CEN standards, the CEER Advice and the work of RE-DISS and Concerted Action – Renewables. He presented four questions that are on the Commission’s mind:

1. Need to improve the GO system?
2. Is it desirable to further harmonise the system?
3. Should GOs be the sole instrument for tracking electricity?
4. Should GOs remain limited to RES-E or should the system be extended to other sources?

He stressed the importance of carefully considering the costs and benefits of all suggestions.

Alex Polfliet from Zero Emission Solutions, working as the consultant to Nike on sustainable energy strategy, then showed how this corporate strategy is put into practice. Nike wanted to be able to prove that they are really into a sustainability strategy, not merely ‘greenwashing’. Nike invested in five wind turbines onsite, also in PV (1 MW), and they buy the GOs from two nearby production facilities: a small hydro and a bio-gas fuelled plant. There is a need to prove that the electricity is sourced on-site or locally. The aim of 100% renewable

energy is preferably reached by auto-production and auto-consumption. If this is not possible, then the energy is purchased from suppliers of locally generated energy, backed by Guarantees of Origin.

Nike also ‘greens’ its gas and fuel consumption, but because there are no green gas GOs in Belgium. It does this by converting the energy into the electricity equivalent, and redeeming GOs for that amount of energy. So there are expectations from industrial customers which are not yet fulfilled by the disclosure system.

Jan van der Lee, Chair of AIB’s Board, presented the AIB’s organisation and achievements, focusing on explaining the philosophy behind the GO and its role in the disclosure process. He summed up the main messages from AIB’s [Reflection Paper](#) on the Forthcoming RES Directive:

- The energy market of the future offers full disclosure on the origin of energy to consumers, encompassing all types of energy not just on renewable energy
- Consumers should be consistently informed about the carbon impact of their energy use
- The social value of the GO (transparency) should be matched with an EU wide economical price – to avoid double perception
- Disclosure information should let energy consumers vote ‘with their feet’, thus putting them in the driver’s seat of the energy market and promote a more sustainable energy model
- Finally, it should help to find an integral approach to a strong energy market based on renewables.

Jörg Mühlhoff, coordinator of the BEUC renewables project, presented the European Consumers organisations’ views. He started the project by doing a tour of BEUC members to collect their views: what are consumers expecting; and do they get what they want – and what they think they are getting? Prosumers are not all there is to bringing renewables to retail market customers!

BEUC finds that there are good (electricity suppliers who have renewable production) and bad (electricity suppliers who have little or no renewable production) ways to use GOs. The ‘bad way’ is not pushing environmental advancement. BEUC sees it as a problem that the GO is not a market driver where investment in renewable energy sources (RES) is concerned: it does not see direct additionality. BEUC formulated three Do’s for “green tariffs”:

1. Increase the transparency of offers at all stages. Consumers’ money should be spent on RES kWhs if they chose a “green tariff”;
2. Full disclosure for a level-playing field (he called this “mainstreaming GOs”);
3. Criteria for measurable environmental benefits. Suppliers’ efforts of obtaining new RES capacities should be tracked.

The message from BEUC was overall rather reassuring, given the consumer organisations’ sometimes hard criticism on the GO-system in the past. They called the system hard to understand, feared double-counting and double-disclosure, and wondered why there should be no physical link, etc... Now, only the need for additionality and the ‘light vs dark green’ electricity viewpoint remain, but BEUC stressed that it does not want to build additionality into the GO, but would welcome labels built on the GO to assure additionality.

All in all, the workshop was a success, as the messages from customers (both household and industrial) and from AIB were in unison.

## Europex Environmental Market work group meets with AIB members

On 6 October 2015 Europex<sup>1</sup> Environmental market work group held its regular meeting on the premises of Borzen, the Slovenian Power Market Operator. Colleagues from HROTE, the Croatian Energy Market Operator (Croatian Issuing Body) and a colleague from E-Control (Austrian Issuing Body) were invited as guests to discuss “hot” topics of the guarantee of origin (GO) system, such as extending the use of GOs to all sources, using the GO system as the sole tool for disclosure; and also issues regarding the trustworthiness of the GO system were discussed.

Angela Tschernutter presented best practices from the Austrian disclosure system, including its development over the past years as well as the relation towards RE-DISS Best Practice recommendations. The revision of disclosure rules in 2011 resulted in growth of disclosure based on GO usage. Regarding the trustworthiness of disclosure – suppliers must satisfy the criteria for trading and

cancelling GOs in order to be approved by the market. E-Control, the Austrian issuing body, regularly updates a list of systems which fulfil the Austrian criteria for accepting foreign GOs for national disclosure purposes.

Furthermore, at the meeting it was argued that extending the scope of GOs to apply to all sources (i.e. also fossil and nuclear) alongside renewables will be the main factor that drives the system forward. It leads to more transparency and market development. As a drawback it is important to point out that it could result in higher costs of the system. However, since the system is mandatory for renewables, the added costs would probably be small. Finally, all participants supported the use of GOs as a sole disclosure tool.

A full disclosure system for all sources of energy has been developed in Austria, Switzerland and in Sweden so far.

Regrettably, the European Commission Summer package does not mention GOs at all. Hopefully, in the future some legislative changes will be made that would spur the GO system forward, preferably based also on recommendations and ideas put forward to the European Commission by the AIB, Europex and others.

During the discussion Europex representatives also emphasized the importance of price transparency on the GO market. The call for increased transparency has been one of the drivers for exchange markets to introduce GOs as a product. On the exchange market data on prices and volumes is published. Only few websites offer these data which are partially available on the AIB portal among others.

The AIB supports meetings with important stakeholders in the EU energy sector, since it reflects on further development of sustainability and guarantees of origin.

<sup>1</sup> Europex is the Association of European Energy Exchanges  
[www.europex.org](http://www.europex.org)

# Statistics

## Methodology

### Frequency of reporting

Statistical data is collected and reported quarterly. Where available, data has been collected for all months since 2000, as this permits a high level of reconciliation between individual and total figures.

### Data items recorded

Data is collected for each domain and month, and relates to single energy sources or groups of energy sources. For each domain / month / source the following is recorded:

- a. **By production date:** issued, expired and cancelled - this lets the market know how many certificates of each vintage are available for trade, so informing price setting.
- b. **By transaction date:** transferred within domain, imported, exported, expired and cancelled - this helps in judging the level of market activity, and making certificate expiry dates visible further informs pricing and trading strategy; and also enables AIB to calculate its membership fees.

### Energy source codes

The list of codes has been prepared by reference to the codes used by all registries, and member preferences. EECS Rules Fact Sheet 5 provides the definitive list of energy source codes, aggregating reported codes into higher-level codes where codes: are **inactive** (e.g. hydro and wave power will be aggregated until such time as wave power becomes more widely used); are **unknown** (e.g. sold renewable fuel may be used where conversion between codes has resulted in the original code becoming unknown); are **not demanded** by the market (e.g. orimulsion is simply reported as "Fossil").

## Analysis

Where possible, the statistical reports will provide a disclaimer explaining shortcomings in the data. This might include domains that do not provide certain items of data, and those that have not contributed to the latest report. The value of publishing data which contains such shortcomings is felt to outweigh the absence of such data.

Some items may solely be useful at a pan-European level (e.g. domains will not know if certificates they issued and exported have been cancelled). Hence it will be possible to know the length of the market across Europe, but not necessarily for certificates issued in a specific country).

Certificates withdrawn by the issuer (perhaps those issued in the wrong quantities or for the wrong technology) are statistically insignificant, and have therefore been ignored.

## General

All certificates are 1MWh. As metering data is the basis for issuing certificates, there is always some delay in gaining accurate statistics for the corresponding data for a specific month, so the most recent quarter's issuing activity will always be understated and consequently this information should be treated with caution.

Statistics for certificates issued in a specific month are not presented, as the value of this data is not clear. In general, "issued by transaction date" will be similar to, but slightly later than, "issued by production date", due to the inevitable delays in processing meter data. Currently, close to 100% of the certificates for energy produced in a month will be issued within the following 6 months.

## Explanatory notes to statistics

### Date of collection of data

These statistics were completed on 3<sup>rd</sup> November 2015 and based on statistics gathered either from statistics published AIB member websites, or where such data is not available, from data provided to the AIB by individual members. The data itself was provided on the following days:

Country	Collected	Source
Austria	26 October 2015	<a href="#">website</a> (password protected)
Belgium - Federal	29 October 2015	spreadsheet provided by CREG
Belgium - Brussels	30 October 2015	spreadsheet provided by Brugel
Belgium - Flanders	27 October 2015	spreadsheet provided by VREG
Belgium - Wallonia	05 October 2015	spreadsheet provided by CWaPE
Croatia	29 October 2015	<a href="#">website</a>
Cyprus	-	Not yet available
Czech Republic	26 October 2015	spreadsheet provided by OTE
Denmark	30 October 2015	<a href="#">website</a>
Estonia	28 October 2015	spreadsheet provided by Elering
Finland	07 October 2015	spreadsheet provided by FinExtra (replaced Grexel from January 2015)
France	03 November 2015	spreadsheet provided by Powernext
Germany	16 October 2015	<a href="#">website</a>
Greece	-	Not yet available
Iceland	29 October 2015	<a href="#">website</a>
Ireland	29 October 2015	<a href="#">website</a>
Italy	29 October 2015	spreadsheet provided by GSE
Luxembourg	29 October 2015	<a href="#">website</a>
Netherlands	08 October 2015	spreadsheet provided by CertiQ
Norway	01 November 2015	<a href="#">website</a>
Portugal	26 October 2015	<a href="#">website</a>
Slovenia	10 January 2012	Only one market party currently, so publication of data would expose their trading position. Data will be published when other market parties commence trading.
Spain	-	Not yet available
Sweden	30 October 2015	<a href="#">website</a>
Switzerland	30 October 2015	<a href="#">website</a> (password protected)

### Aggregation of data

In some cases detailed data has been aggregated. For instance “manure” also refers to “pig manure”, and “fossil” also contains “unknown source”. Further, unspecified renewable energy contains that which originates from technology codes T05000000 (combustion) and T07000000 (known).

### Completeness of data

The Grexel registries (DK, FI, IS, LU, NO and SE) provide all required information, and have done for a number of months. However, information from these domains relating to periods prior to the adoption of this version of the registry is not always available. For instance, the previous registries did not record the quantity of cancellations by production date that had taken place during the life of these registries.

The LogActiv registries (ES and PT) do not currently provide facilities for the expiry of certificates; and the Austrian registry does not currently provide expiry data.

The difference between total exports and imports is the result of absences in the information gathered, and due to exports to Belgium needing to be accepted by the importer, introducing delay registering the transaction (and which is potentially treated differently by different registries).

### Change to pie-charts

The basis of the pie charts has changed since the last statistics report: in the past, issued certificate referred to those certificates issued for electricity produced in a year, but cancellation referred to certificates cancelled in a year, regardless of when the associated electricity was produced. Now, both refer to the date of production of the associated electricity.

Further, to make the charts more clear, only contributions of 1% or greater are shown.

### Statistical report

During the third quarter of 2015, market activity continued to increase, as has the use of guarantees of origin (GOs<sup>1</sup>) for disclosure purposes – which is now appreciably higher than it was at this time of the year in any preceding year.

These graphs illustrate activity in two ways:

- Activity by production date** – this shows the quantity of GOs issued, expired and cancelled which relate to **electricity produced in a given year**; and indicates those which either remain on the market or are otherwise unaccounted for.
- Activity by transaction date** – this shows the quantity of certificates **actually** issued, transferred within that country or region, transferred internationally, expired and cancelled in a given year.

Issue, transfer and cancellation continue to increase over preceding years.

Further growth is expected as new countries are connected to the Hub, and as the RECS scheme ceases and member countries replace RECS certificates with GOs – the last issuers of RECS certificates (at the end of 2014) were Spain and Portugal: Spain ceased transferring RECS certificates at this point; while Portugal will continue to transfer them until the end of 2015.

Ireland (SEM-O) and Federal Belgium (CREG) became members in May 2015, and are now active.

Spain (CNMC) has applied for membership, replacing GCC (but issuing GOs rather than RECS certificates), and now expects to become active in 2016Q1. Also, Energimyndigheten of Sweden has applied for membership, and expects to replace Grexel and become active in mid-2016. Finally, Greece has also applied for membership, and will probably also become active in 2016.

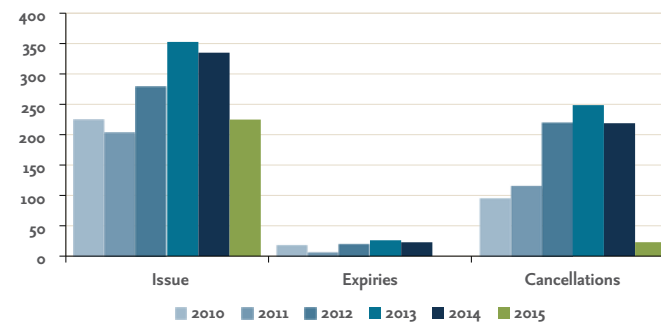
Croatia completed changes to its legislation, and is now active. Cyprus is testing its registry against the new AIB Hub, and will connect to the new Hub with the other members.

The United Kingdom and Serbia are official observers; and contact continues with interested parties in Poland, Hungary, Slovakia, Bosnia and Herzegovina and Montenegro.

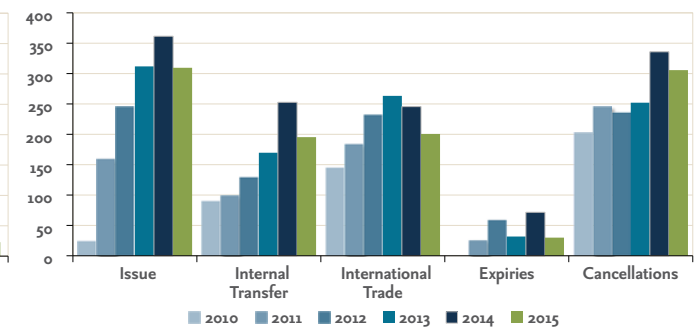
The United Kingdom and Serbia are now official observers; while contact continues with interested parties in Poland, Hungary, Slovakia, Bosnia and Herzegovina and Montenegro.

<sup>1</sup> Note that this includes the few remaining RECS certificates (these ceased to be issued from the end of 2014, and they will all expire and no longer be transferrable via the AIB Hub at the end of 2015).

Annual EECS transactions by production date (TWh)



Annual EECS transactions by transaction date (TWh)



It is also interesting to see how the market has developed since its inception in 2001. Note that the issuing statistics are now based on transactions dates, whereas previous newsletters used the production dates for these.

Cancellation continues to grow, and looks like exceeding last year's record levels; demonstrating the increased use of GOs for purposes of selling products for differentiated energy sources. Note that issuing tends to be 20% understated over the past quarter, due to delays in capturing metering data, so it is more than likely that this year's issuing will exceed last year's.

The monthly discrepancy between exports and imports is due to not all transfers being instantaneous, so hence trades which commence in one month can complete the following month; however, the general shape of the import and export graphs is similar.

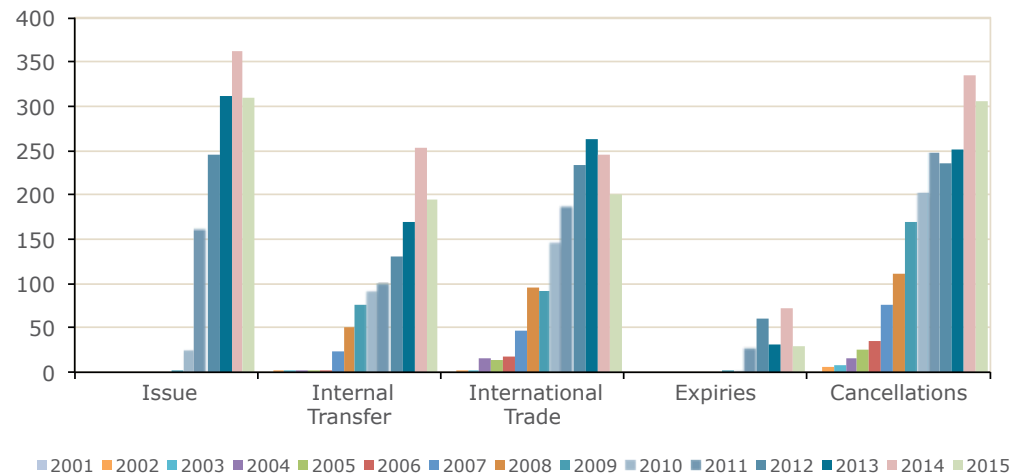
In 2014, Norway, Sweden, Finland and Austria were the major exporters, closely followed by France and Belgium; while Germany, Netherlands, Sweden, Norway and Belgium remained the main importers. So far in 2015, the major exporters have been Norway, Switzerland, Sweden and Finland; while Germany, Norway, Belgium, Netherlands, Austria, Sweden, and Finland remained the main importers. During both years, some countries figure in both exports and imports, suggesting trading activity.

There are still trades where certificates are cancelled in one country for use in another: these are known as "ex-domain cancellations (EDCs)". The EECS Rules only permit this where transfer is technically impossible, so this does not occur between member countries.

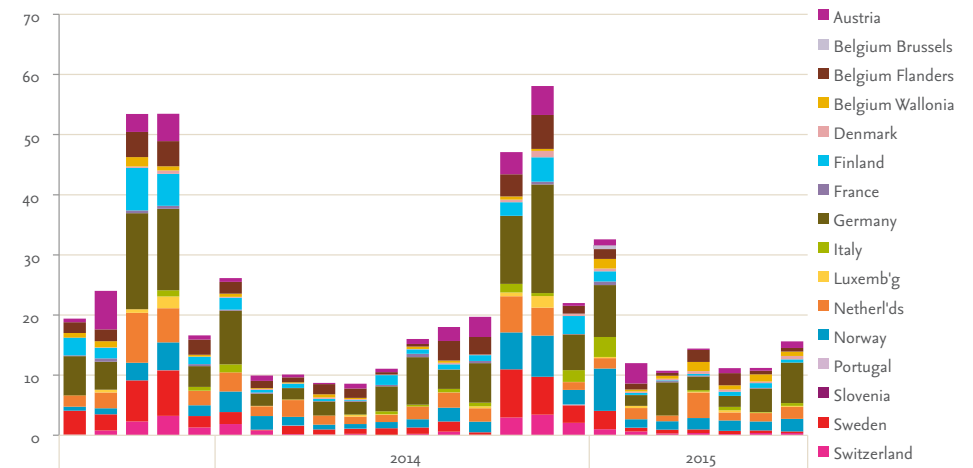
EDCs can and do occur between member countries and non-member countries; and AIB is currently seeking to quantify the size of this market sector, and to agree with market parties whether such information can be published without compromising their activity and trading positions.

EDCs may also occur where the account holder either does not reveal (or perhaps conceals) the country for which GOs are being cancelled: this is a matter for individual competent bodies.

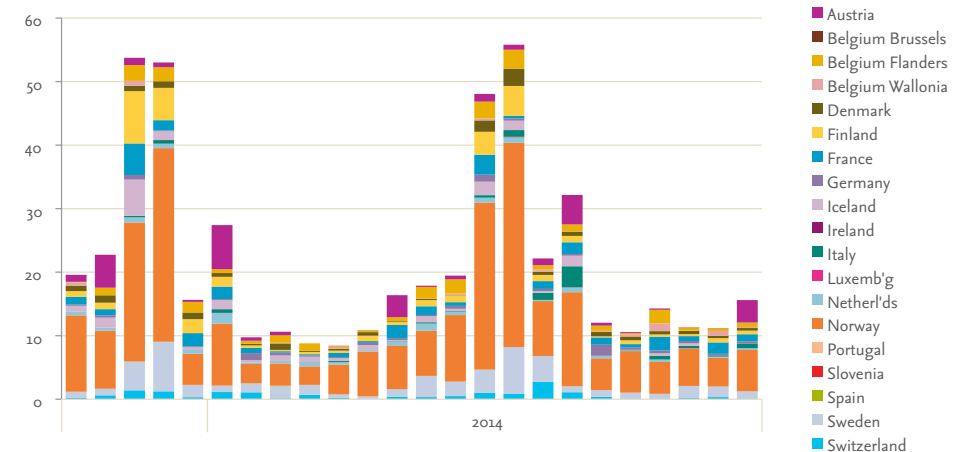
Annual EECS transactions by transaction date (TWh)



Monthly imports per country (TWh)



Monthly exports per country (TWh)



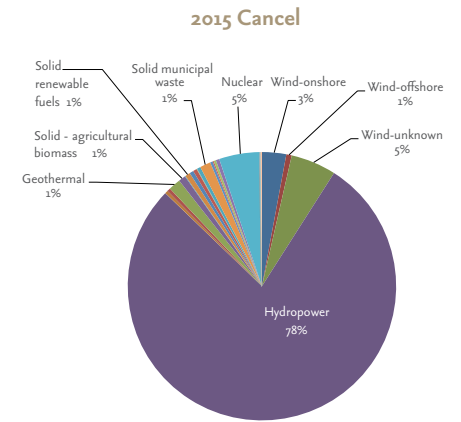
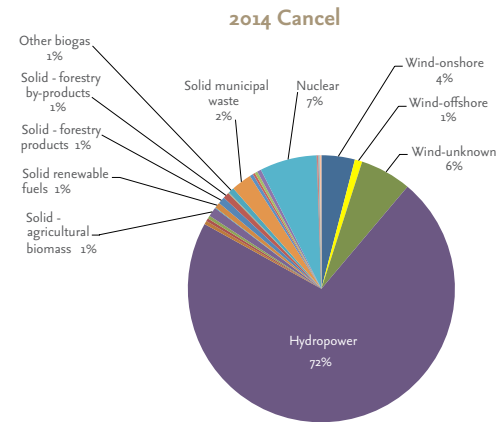
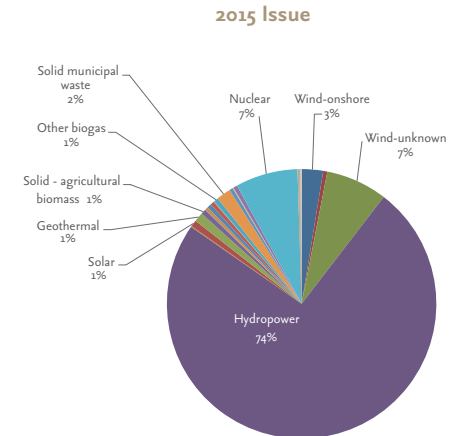
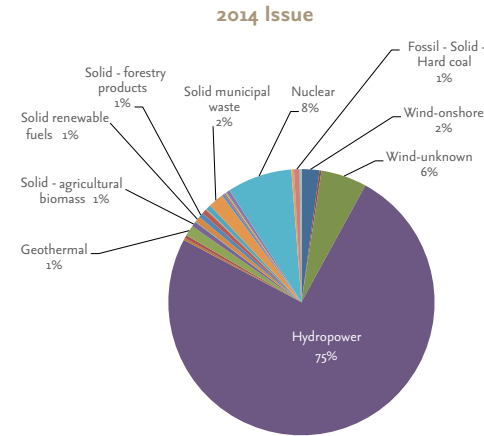
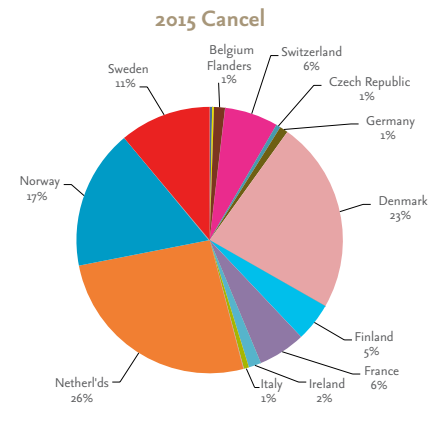
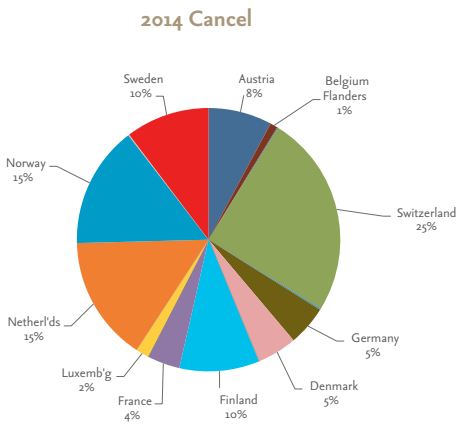
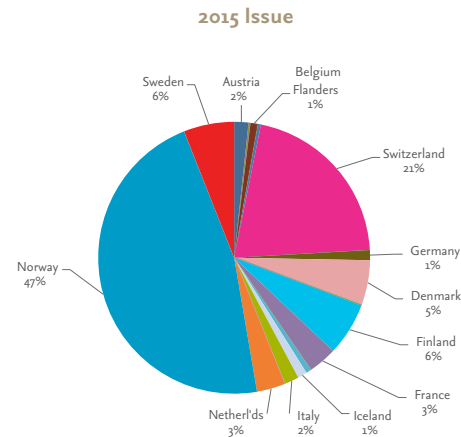
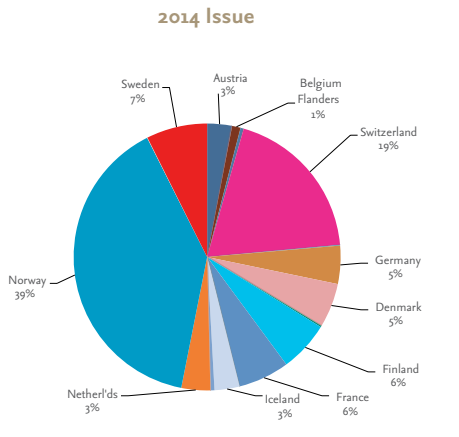


The following graphs are based on specific “vintages” of certificate (i.e. associated with electricity produced in a particular year), and show the final destination of GOs associated with electricity produced by each member country in a year.

Broadly, the picture in 2015 is similar to 2014, although Germany is issuing far less GOs, which is currently hard to explain, and Switzerland seems to have replaced Denmark for cancellations.

So far, the contribution of the various fuel sources remains broadly similar to last year: for renewables, hydropower remains by far the prevalent renewable energy source, followed by wind and then biomass.

Certificates for fossil and nuclear are increasingly being issued, as countries increasingly certify all sources of energy, and not just renewable energy.

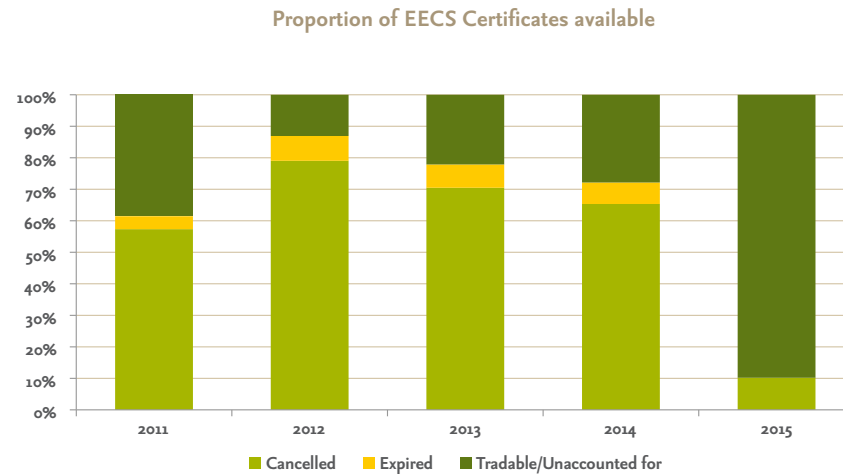
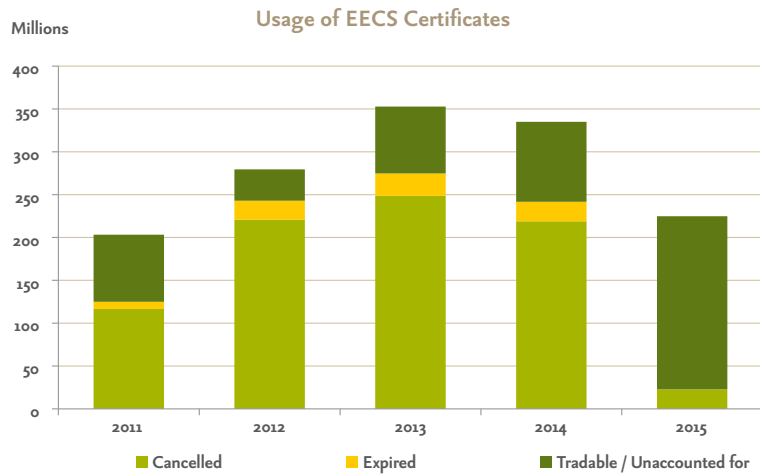


Comparing the status of different vintages of EECS certificate, we can see what has happened to the certificates that were issued for energy produced in the last four years - that is, whether the certificates have:

- been cancelled as evidence of supply;
- expired due to it being more than one year since the associated energy was produced (as required by Directive 2009/28/EC); or
- whether their whereabouts is unknown. This may mean that they remain available for trade, but it could also be that they have been transferred to a registry that does not currently report expiry and cancellation by the date of production.

Two graphs are shown. In the first, actual numbers of certificates are given; while the second illustrates the proportion of certificates in each category.

The picture is becoming clearer as more and more registries support expiry.



The following tables display the raw data by domain at a yearly level. Aggregated totals are given for the period since records began (2000); and for the period from January 2013 until the date of collection of

the data (during October/November 2015 – although note that not all registries can provide the required information upon request – see also “Explanatory notes to statistics” in this statistical report).

### ISSUING, TRADE & REDEMPTION FOR ALL FUELS

		TOTAL : 2001 TO 2015								2013 TO 2015									
		PRODUCTION			TRANSACTION					PRODUCTION			TRANSACTION						
		ISSUE	EXPIRE	CANCEL	ISSUE	TRANSFER	EXPORT	IMPORT	EXPIRE	CANCEL	ISSUE	EXPIRE	CANCEL	ISSUE	TRANSFER	EXPORT	IMPORT	EXPIRE	CANCEL
Austria		49.732.605		64.436.278	52.670.827	92.817.239	65.688.849	123.169.448		96.896.518	26.908.849		32.563.900	32.646.565	47.001.495	38.340.344	53.985.892		49.222.452
Belgium (Federal)		450.657			450.657						450.657			450.657					
Belgium Brussels		160.874		102.041		4.584.934	14.800	11.513.821		17.179.103	150.080		102.041		4.584.053	14.800	3.651.437		9.740.965
Belgium Flanders		24.693.543	4.243.296	14.638.943	20.497.311	94.681.498	42.427.527	199.790.732	6.275.501	136.721.538	9.097.310	2.760.297	4.939.464	9.847.973	54.967.060	35.598.736	67.542.740	5.046.701	30.107.806
Belg & Lux RECS		113.390					2.031.496			2.048.355									
Belgium Wallonia		8.621.354		2.553.168	3.751.056	29.146.880	13.434.752	67.829.805	950.893	45.005.173	3.565.992		1.164.949	3.751.056	19.479.044	7.013.291	22.734.575	679.127	12.051.181
Belgium		34.039.818	4.243.296	17.294.152	24.699.024	128.413.312	55.877.079	281.165.854	7.226.394	200.954.169	13.264.039	2.760.297	6.206.454	14.049.686	79.030.157	42.626.827	93.928.752	5.725.828	51.899.952
Switzerland		209.676.371	28.084.858	140.951.635	210.514.721	102.015	25.264.055	42.692.857	74.478.850	164.267.047	173.015.868	28.084.858	110.440.156	176.300.450		18.288.481	29.484.857	74.478.850	139.824.423
Cyprus																			
Czech Republic		1.205.442	199.374	1.247.470	1.205.442	1.848.939		1.140.374	199.374	1.247.470	1.205.442	199.374	1.247.470	1.205.442	1.848.939		1.140.374	199.374	1.247.470
Germany		45.858.434	3.984.311	162.988.963	51.077.693	195.393.253	24.973.406	347.824.839	7.444.514	335.005.690	40.389.523	3.984.311	30.392.996	46.684.169	146.925.470	13.598.685	190.825.836	7.444.514	209.524.462
Denmark		72.667.044	7.133.378	29.177.032	62.872.354	26.294.268	42.622.450	15.434.697	7.133.378	31.000.050	42.534.067	3.379.848	21.951.677	44.466.509	19.702.924	23.556.005	8.707.366	4.361.414	24.341.563
Estonia		565.079		57.939	1.134.536	800.677	416.427	200.613	385.635	177.861	565.079		57.939	1.134.536	800.677	416.427	200.613	385.635	177.861
Spain		14.686.142			3.435.153		5.409.210	58.380		6.543.588	1.546.358			2.648.299		626.743	58.377		
Finland		156.024.990	7.948.021	88.587.064	94.490.730	54.267.863	186.736.371	168.157.080	7.948.021	104.043.774	53.076.052	854.137	42.080.511	55.819.212	29.736.823	58.904.282	62.882.645	7.948.021	57.961.958
France		97.985.464	13.519.233	30.630.899	75.422.911	15.342.790	35.907.796	23.578.441	17.424.516	77.770.248	48.763.706	1.578.038	17.177.410	55.567.420	7.038.753	33.870.298	5.563.600	13.519.233	24.868.656
Croatia				22.574										22.574			23.013		22.574
Ireland		1.604.094		348.349	1.441.680	170.207	10.001	202.000		348.349	1.441.680		348.349	1.441.680	170.207		202.000		348.349
Iceland		33.739.117	986.356	328.694	33.739.117	2.449.967	32.383.123	1.018.443	986.356	328.694	24.445.933	47.536	75.949	28.369.916	2.449.967	28.036.227	718.432	986.356	328.694
Italy		91.806.282	1.434.278	28.987.906	64.748.303	117.532.471	20.396.472	24.320.439	5.021.948	119.266.071	35.784.785	1.434.278	28.948.157	64.748.303	96.549.977	9.925.812	14.523.558	5.021.948	68.919.449
Luxembourg		184.298	396.287	11.289.959	184.298	5.561.876	991.323	13.522.959	396.287	11.289.959	183.565	105.661	6.828.491	183.571	5.160.245	666.617	10.309.626	396.287	9.652.602
Netherlands		106.736.308	3.987.074	127.883.944	21.200.472	74.907.878	27.103.420	241.703.303	3.987.079	302.422.218	30.784.751	1.754.434	79.886.776	21.200.472	24.901.714	17.342.085	91.841.485	3.544.541	106.509.661
Norway		1.071.461.207	59.613.240	108.883.233	595.412.536	361.315.558	802.022.510	117.299.584	59.613.240	246.192.677	361.633.912	3.540.577	63.126.558	370.740.575	147.508.428	332.320.258	70.990.057	7.229.373	82.342.440
Portugal		1.455.576		422.472	477.440		1.064.056	371.468		487.048	362.933		395.587	391.008		106.800	312.766		418.622
Sweden		386.732.835	27.529.038	147.826.094	122.699.293	20.852.122	178.691.133	152.517.665	27.529.038	324.674.976	56.676.196	1.147.127	48.686.403	65.165.742	8.858.524	76.811.308	73.705.263	1.885.547	65.943.495
Slovenia		4.002.666				668.004	117.018			1.927.200									
UK		90.158																	
TOTAL		2.380.704.587	159.058.744	961.364.657	1.417.877.187	1.098.070.435	1.506.225.685	1.554.518.475	219.774.630	2.024.866.181	912.582.738	48.870.476	490.437.357	982.763.555	617.684.300	695.437.199	709.404.512	133.126.921	893.554.683

## ISSUING, TRADE & REDEMPTION FOR ALL FUELS

	2015									2014								
	PRODUCTION			TRANSACTION						PRODUCTION			TRANSACTION					
	ISSUE	EXPIRE	CANCEL	ISSUE	TRANSFER	EXPORT	IMPORT	EXPIRE	CANCEL	ISSUE	EXPIRE	CANCEL	ISSUE	TRANSFER	EXPORT	IMPORT	EXPIRE	CANCEL
Austria	3.806.647		69.621	9.887.407	11.453.427	11.066.733	16.506.617		15.240.640	9.983.403		17.075.119	11.933.527	20.802.434	14.642.930	18.926.148		15.739.673
Belgium (Federal)	450.657			450.657														
Belgium Brussels	74.681		50.295		1.500.186		623.835		2.392.283	75.399		51.746		3.077.384				2.782.754
Belgium Flanders	1.966.301		304.732	3.167.030	18.141.880	12.120.236	17.350.956	833.604	4.457.925	3.463.679	1.369.855	1.994.057	3.553.502	22.929.637	15.059.446	24.661.839	1.870.625	12.074.962
Belg & Lux RECS																		
Belgium Wallonia	822.518		4.930	1.505.615	4.782.812	3.186.320	6.906.406	395.194	97.353	1.303.648		280.307	2.245.441	8.754.605	900.708	3.809.485	184.875	4.175.207
Belgium	3.314.157		359.957	5.123.302	24.424.878	15.306.556	24.881.197	1.228.798	6.947.561	4.842.726	1.369.855	2.326.110	5.798.943	34.761.626	15.960.154	28.471.324	2.055.500	19.032.923
Switzerland	47.001.020		1.486.107	53.275.669		6.378.553	9.008.451	14.448.473	54.890.825	64.061.423	14.774.110	54.469.415	63.371.975		7.149.631	11.774.398	50.367.293	54.143.349
Cyprus																		
Czech Republic	40.980		123.756	150.213	807.339		1.134.037	41.964	465.458	287.948	41.933	403.577	810.356	820.118		6.337	157.410	778.105
Germany	2.701.058		233.255	14.160.403	42.735.316	4.458.347	54.641.551	3.324.003	79.151.507	15.474.098	453.053	10.754.081	18.402.937	53.838.657	4.824.014	67.430.491	4.120.511	80.439.277
Denmark	11.856.502		5.346.992	15.244.116	7.607.554	7.591.598	4.635.107	2.438.518	12.012.779	17.851.220	2.291.047	10.702.552	16.533.662	8.607.918	7.176.803	2.363.459	987.700	8.330.499
Estonia	378.595		949	926.040	800.677	416.427	200.613	337.871	77.728	186.484		56.990	208.496				47.764	100.133
Spain										529.595			849.587		228.546	38.377		
Finland	14.120.539		1.074.821	19.227.968		9.396.934	11.475.160	228.731	15.507.445	20.419.657	164.760	21.489.741	20.874.102	15.330.358	17.177.936	16.582.922	7.719.290	25.429.302
France	7.669.862		1.321.743	15.769.511	2.716.262	11.041.742	1.603.544	647.195	6.364.974	20.779.785	647.195	8.796.334	20.178.649	2.278.514	14.952.064	2.710.031	930.843	7.927.689
Croatia							23.013		22.574			22.574						
Ireland	1.441.680		348.349	1.441.680	170.207		202.000		348.349									
Iceland	2.513.007			5.274.078	1.443.380	4.483.231		22.221	5.701	10.142.345	22.221	6.681	10.041.952	25.747	10.072.162	68.000	25.315	70.228
Italy	3.799.174		146.169	23.377.069	44.689.936	7.412.987	7.221.324	3.440.938	34.103.094	1.589.962		261	27.435.216	45.611.330	2.104.246	6.430.277	1.581.010	31.614.057
Luxembourg	96.953		12.097	124.177	1.701.647	226.118	3.316.991	99.966	3.514.750	65.093	98.659	3.521.653	47.010	1.647.211	165.981	3.514.224	296.321	3.317.580
Netherlands	7.618.965		5.956.866	9.583.306	5.643.982	3.043.293	19.510.322	1.118.514	28.612.158	11.713.575	585.214	33.659.442	11.617.166	8.959.120	7.944.970	32.495.837	1.015.165	37.941.424
Norway	104.987.108		3.891.275	112.432.231	48.566.743	99.998.894	28.993.921	1.680.948	27.677.897	132.196.066	1.574.017	32.851.473	130.513.251	58.137.703	116.935.996	27.670.840	1.872.262	29.917.140
Portugal						11.800	155.963		205.659	173.524		225.236	186.341			155.446		181.287
Sweden	13.486.666		2.541.638	23.550.368	2.577.692	25.270.132	17.017.566	781.628	20.528.846	24.700.974	757.459	22.547.396	22.633.802	1.934.611	26.903.557	26.912.797	419.372	20.885.508
Slovenia																		
UK																		
TOTAL	225.283.570	0	22.913.595	309.998.195	195.339.040	206.103.345	200.527.377	29.839.768	305.677.945	334.997.878	22.779.523	218.908.635	361.436.972	252.755.347	246.238.990	245.550.908	71.595.756	335.848.174

Similar to the “by country” data above, the following tables display the raw data “by technology” at a yearly level.

See also the AIB website at [Statistics](#) for Excel spreadsheets in both Excel 2003 and Excel 2010 formats, containing the detailed data since records began, summarised by year; and also by month.

ISSUING, TRADE & REDEMPTION FOR ALL COUNTRIES																			
		TOTAL : 2001 TO 2015										TOTAL : 2013 TO 2015							
		PRODUCTION			TRANSACTION						PRODUCTION			TRANSACTION					
		ISSUE	EXPIRE	CANCEL	ISSUE	TRANSFER	EXPORT	IMPORT	EXPIRE	CANCEL	ISSUE	EXPIRE	CANCEL	ISSUE	TRANSFER	EXPORT	IMPORT	EXPIRE	CANCEL
Wind	Wind - onshore	77.390.912	1.334.551	31.908.095	21.411.468	48.692.470	25.796.306	43.211.467	2.296.717	76.970.390	23.241.064	885.716	22.430.833	19.658.550	25.019.281	6.217.170	14.511.034	1.769.677	31.391.806
	Wind - offshore	6.832.181	522.180	5.710.363	1.985.512	4.975.079	1.835.414	7.955.160	593.504	9.885.627	2.673.860	198.851	4.512.617	1.985.512	2.983.494	1.400.375	6.720.639	527.365	6.319.499
	Wind - unknown	69.428.447	6.192.214	35.432.556	72.466.755	37.956.888	58.242.703	36.730.765	7.794.668	37.855.595	48.475.005	1.544.342	26.788.075	52.424.972	32.080.159	40.092.849	28.047.136	4.426.582	33.086.361
		153.651.540	8.048.945	73.051.014	95.863.735	91.624.437	85.874.423	87.897.392	10.684.889	124.711.612	74.389.929	2.628.909	53.731.525	74.069.034	60.082.934	47.710.394	49.278.809	6.723.624	70.797.666
Hydro/marine		1.878.651.923	107.061.199	756.322.894	1.116.820.766	892.161.514	1.350.380.387	1.381.622.479	163.432.514	1.633.242.283	686.762.009	22.220.195	348.523.828	750.848.832	494.126.870	604.379.765	607.124.591	97.482.917	709.821.989
	Unspecified mechanical/other	19.207	41.731	177.049	65.661	21.923	15.697	5.896.803	726	5.847.112	19.207	8.237	10.206	65.661	21.042	15.697	4.179	726	32.900
	Unspecified renewable energy	2.277.091	1.039.576	1.934.725	4.077.413	1.569.158	1.668.446	9.456.919	1.552.505	2.057.905	2.277.091	1.039.565	1.823.985	4.077.413	1.485.081	1.660.258	9.209.897	1.552.494	1.936.849
	Unspecified heat		100						100			100						100	
	Solar	5.597.065	3.806.763	2.296.923	4.991.742	2.580.169	1.767.192	2.143.359	3.414.400	2.890.768	3.881.043	2.703.225	1.776.130	3.741.453	2.244.608	1.645.217	2.029.870	3.291.110	2.534.553
	Geothermal	20.748.833	226.726	4.940.415	15.398.836	9.976.925	13.598.697	13.556.467	272.506	17.500.529	13.097.576	207.511	4.529.370	14.935.887	9.749.292	13.407.519	13.365.278	272.506	11.882.325
Other		28.642.196	5.114.896	9.349.112	24.533.652	14.148.175	17.050.032	31.053.548	5.240.237	28.296.314	19.274.917	3.958.638	8.139.691	22.820.414	13.500.023	16.728.691	24.609.224	5.116.936	16.386.627
	Solid - agricultural biomass (inc. energy crops)	8.489.306	293.441	6.171.095	6.185.010	1.496.478	4.262.921	5.165.779	322.310	7.871.635	5.527.010	67.313	5.884.032	5.846.818	364.948	3.426.160	4.326.717	317.820	6.485.009
	Solid - agricultural products	804.029	76.202	524.010	554.293	182.170	264.355	285.259	82.805	480.059	518.848	47.713	395.731	544.596	153.911	173.439	171.467	76.076	407.104
	Solid - renewable fuels (inc. For&Ag bp & w)	56.483.494	2.572.712	9.172.412	12.786.093	31.863.872	19.864.432	18.773.267	2.780.456	50.333.071	5.838.854	1.430.205	3.835.185	7.420.822	9.191.856	2.714.325	1.873.532	2.616.156	5.730.703
	Solid - forestry products	7.644.341	222.898	5.966.002	5.886.671	6.120.540	3.558.258	3.150.897	484.905	7.265.256	5.727.414	97.171	4.455.158	4.961.428	4.994.825	2.294.632	1.947.434	457.678	6.135.047
	Solid - forestry by-products & waste	10.715.479	567.607	3.824.364	5.872.627	4.610.873	2.950.812	2.685.265	772.513	6.550.913	4.893.383	388.724	3.263.721	4.861.343	2.655.459	1.514.509	1.676.325	660.730	4.759.095
	Gas - landfill	4.206.403	84.629	919.497	932.496	2.921.165	241.644	262.048	115.770	3.030.599	707.062	28.533	469.640	708.021	742.065	65.890	57.239	84.201	665.644
	Gas - sewage	449.004	46.038	168.228	380.758	258.208	1.024.374	1.141.920	257.941	196.849	326.992	33.321	96.310	322.121	27.739	441.808	472.315	257.941	129.077
	Gas - other biogas	9.181.650	727.031	4.786.824	5.420.830	4.994.922	1.289.293	1.311.768	1.177.924	6.737.420	4.872.915	364.609	3.240.509	4.250.855	3.042.925	1.023.079	1.093.450	1.042.274	4.046.531
	Solid - municipal biogenic waste	32.223.866	1.465.937	14.421.874	16.853.151	11.364.148	7.204.668	5.647.413	1.577.164	23.952.525	16.200.329	436.689	11.434.902	14.739.929	6.375.149	4.960.425	4.029.742	1.245.453	13.398.279
	Liquid - renewable fuels (inc. Mun.waste)	3.787.555	99.624	2.318.095	4.006.923	3.019.769	1.882.104	1.877.844	577.398	3.292.525	3.346.027	86.957	2.013.223	3.865.744	2.851.123	1.766.622	1.287.947	261.808	2.922.883
	Liquid - black liquor	1.421.053	20.721	1.255.958	1.412.053	1.379.514	1.673.802	1.807.422	21.849	1.286.936	1.062.998	20.382	1.210.757	1.120.649	1.037.088	1.026.213	1.275.170	21.849	1.275.334
	Solid - unspecified wood	1.250.051	96.095	1.507.948	1.330.439	523.533	785.029	1.693.701	117.729	1.719.172	1.138.032	46.196	1.427.115	1.330.439	522.905	784.898	1.683.570	117.729	1.709.172
	Solid - industrial & commercial waste	17.800.551	551.570	5.705.995	7.197.294	12.366.227	1.531.304	2.540.981	1.134.921	14.853.270	3.859.300	414.001	2.198.183	4.125.340	3.671.245	508.631	1.395.153	1.047.091	3.756.372
	Biomass	154.456.782	6.824.505	56.742.302	68.818.638	81.101.419	46.532.997	46.343.564	9.423.685	127.570.230	54.019.164	3.461.814	39.924.466	54.098.105	35.631.238	20.700.631	21.290.061	8.206.806	51.420.250
RENEWABLE		2.215.402.441	127.049.545	895.465.322	1.306.036.791	1.079.035.545	1.499.837.838	1.546.916.983	188.781.325	1.913.820.439	834.446.019	32.269.556	450.319.510	901.836.385	603.341.065	689.519.481	702.302.685	117.530.283	848.426.532
NUCLEAR		149.329.722	29.572.082	58.170.289	94.140.088		145.857	145.857	28.510.569	101.424.617	68.096.753	14.175.415	35.897.168	68.096.753		145.855	145.855	13.113.902	35.589.316
	Unknown	1.715.547	49.869	87.842	1.487.319	497.631	1.384.920	33.430	49.745	81.482	1.705.879	49.866	56.352	1.482.195	497.631	1.374.920	3.893	49.745	77.842
	Solid - Unknown																		
	Solid - Hard coal	2.238.884	1.692.251	440.000	2.238.884	440.000	249.582	689.582	1.692.251	440.000	2.238.884	1.692.251	440.000	2.238.884	440.000	249.582	689.582	1.692.251	440.000
	Solid - Brown coal	67			67						67			67					
	Solid - Peat	368			368		368	368			368			368		368	368		
	Solid - Municipal solid waste	1.314.952	418.250	522.476	1.286.838		3.706	124.425	443.179	522.476	1.272.641	418.250	522.476	1.267.328		3.706	124.425	443.179	522.476
	Solid - Industrial and commercial waste	138.151	22.866	95.779	161.237		6.369	6.360	27.018	95.779	120.318	11.258	91.605	160.171		6.369	6.360	27.018	95.779
	Liquid - Unknown	6.913		6.913	6.913					6.913	6.913		6.913	6.913					6.913
	Liquid - Crude oil	11.074	9.812		11.074		418	418	9.812		11.074	9.812		11.074		418	418	9.812	
	Liquid - Natural gas	101.855									101.855								
	Liquid - Petroleum products	93.872	42.742	2.797	93.872				62.611	2.797	72.258	42.742	2.797	93.872				62.611	2.797
	Gaseous - Unknown	1.798		38	18.076		2	2.270	167		1.798		38	18.076		2	2.270	167	
	Gaseous - Natural gas	9.898.286	201.327	6.573.201	11.945.003	18.097.259	4.596.625	6.600.952	195.850	8.471.511	4.507.911	201.326	3.100.498	7.551.469	13.405.604	4.136.498	6.130.826	195.850	8.392.861
	Gaseous - Coal-derived gas																		
	Gaseous - Petroleum products																		
	Gaseous - Municipal gas plant																		
	Gaseous - Process gas																		
	Heat - unknown							100										100	
	Heat - Process heat																		
FOSSIL		15.521.767	2.437.117	7.729.046	17.249.651	19.034.890	6.241.990	7.455.635	2.482.736	9.621.125	10.039.966	2.425.505	4.220.679	12.830.417	14.343.235	5.771.863	6.955.972	2.482.736	9.538.835
	TOTAL	2,380,253,930	159,058,744	961,364,657	1,417,426,530	1,098,070,435	1,506,225,685	1,554,518,475	219,774,630	2,024,866,181	912,582,738	48,870,476	490,437,357	982,763,555	617,684,300	695,437,199	709,404,512	133,126,921	893,554,683



Issuing, Trade & Redemption for All Countries																					
	2015									2014											
	Production			Transaction						Production			Transaction								
	Issue	Expire	Cancel	Issue	Transfer	Export	Import	Expire	Cancel	Issue	Expire	Cancel	Issue	Transfer	Export	Import	Expire	Cancel			
Wind	Wind - onshore	5.786.991		2.854.081	7.739.865	5.383.696	1.897.006	4.057.182	491.961	8.909.721	7.294.249	184.328	8.848.359	10.265.696	12.397.429	2.759.961	5.017.663	896.139	13.261.949		
	Wind - offshore	1.114.799		545.560	1.265.088	632.361	569.086	2.047.039	14.125	2.004.177	788.588	11.717	1.978.186	720.424	1.347.477	254.074	2.540.479	208.401	2.930.172		
	Wind - unknown	16.544.849		5.978.125	21.351.821	13.565.765	16.379.120	12.842.804	2.108.927	16.680.792	18.627.482	578.992	13.590.391	19.516.217	12.586.745	12.691.870	7.760.664	1.601.649	11.192.695		
		23.446.639		9.377.766	30.356.774	19.581.822	18.845.212	18.947.025	2.615.013	27.594.690	26.710.319	775.037	24.416.936	30.502.337	26.331.651	15.705.905	15.318.806	2.706.189	27.384.816		
Hydro/marine			166.937.395		8.532.299	229.006.087	159.325.325	174.055.388	168.472.567	12.666.693	238.953.386	250.497.389	7.990.288	157.389.305	270.566.129	204.587.172	217.404.400	217.786.906	57.418.585	259.738.051	
	Unspecified mechanical/other	7.375			54.049	7.844	7.497	2.407		30.679			5.538		1.985	5.953	6.640	6.428	726	2.100	
	Unspecified renewable energy	268.523		306.989	1.572.055	567.138	671.436	940.336	812.658	1.118.529	899.114	276.018	924.753	1.929.038	575.546	872.201	412.506	739.836	715.415		
	Unspecified heat								100			100									
	Solar	1.730.101		191.844	1.650.328	1.349.346	1.030.382	1.115.969	731.301	1.217.196	1.208.870	1.360.706	775.023	1.253.984	840.532	251.646	337.457	1.479.333	800.098		
	Geothermal	2.506.262		150.000	5.252.218	3.164.200	4.756.186	4.427.169	210.664	4.415.732	4.352.029	23.505	823.189	5.471.450	5.049.355	4.481.584	4.395.655	42.638	4.543.936		
Other		4.512.261		648.833	8.528.650	5.088.528	6.465.501	6.485.881	1.754.723	6.782.136	6.465.551	1.660.329	2.524.950	8.660.425	6.472.073	5.611.859	5.145.618	2.262.533	6.061.549		
Solid - agricultural biomass (inc. energy crops)		1.348.755		1.554.821	1.671.213	170.180	384.985	959.450	37.493	2.592.450			2.048.557	30.142	2.465.055	1.975.108	52.372	625.392	725.401	41.247	2.778.958
Solid - agricultural products		164.220		98.915	212.000	41.136	97.192	97.133	35.631	236.774	237.365	39.407	190.034	213.992	70.075	2.948	2.720	22.264	133.907		
Solid - renewable fuels (inc. For&Ag bp & w)		795.359		258.312	2.911.204	3.515.213	1.312.680	596.550	511.820	1.873.257	2.344.926	231.162	1.491.706	3.316.714	3.385.644	986.643	632.775	1.941.868	2.036.538		
Solid - forestry products		1.121.156		391.465	2.058.796	881.995	672.482	505.556	243.380	1.467.333	1.986.193	21.389	1.873.910	2.040.102	1.692.787	649.098	649.092	83.688	1.995.200		
Solid - forestry by-products & waste		1.046.227		215.385	1.524.188	401.819	311.886	317.143	149.941	1.408.546	1.960.132	64.570	1.649.838	2.455.464	1.272.169	437.341	556.101	409.543	2.201.115		
Gas - landfill		111.544		37.571	178.997	172.421	13.970	13.287	17.874	166.446	273.283	8.847	190.239	388.717	391.597	18.540	18.540	43.472	307.413		
Gas - sewage		99.359		2.222	141.572	5.102	1	1	5.357	55.917	156.231	5.212	85.667	121.470	4.318	6.647	2.756	199.586	40.056		
Gas - other biogas		1.230.316		369.987	1.578.546	1.159.233	247.173	241.113	146.785	1.336.128	1.941.779	120.714	1.539.503	1.876.522	1.209.592	389.163	368.456	579.640	1.513.163		
Solid - municipal biogenic waste		3.813.288		750.276	5.601.562	1.704.586	1.213.869	915.152	414.961	3.949.135	6.238.026	181.652	5.404.593	7.060.974	2.498.654	2.139.648	1.500.983	442.541	6.696.444		
Liquid - renewable fuels (inc. Mun.waste)		892.844		53.109	1.366.827	1.106.160	877.990	656.250	153.614	936.278	1.119.419	6.499	916.709	1.338.462	1.016.191	512.071	231.019	90.024	1.401.284		
Liquid - black liquor		88.099		112.725	130.903	204.730	341.683	474.589	8.907	440.167	559.974	8.840	591.706	706.073	585.542	341.188	546.359	12.942	642.505		
Solid - unspecified wood		252.600		211.418	480.774	203.166	296.890	691.973	30.702	828.953	504.852	9.703	724.368	422.111	129.268	199.464	491.936	37.500	583.675		
Solid - industrial & commercial waste		1.072.824		215.061	1.529.058	1.389.725	150.186	262.628	170.292	1.294.444	1.484.024	155.656	1.071.892	1.161.663	1.315.623	94.278	453.955	644.764	1.077.416		
Biomass		12.036.591		4.271.267	19.385.640	10.955.466	5.920.987	5.730.825	1.926.757	16.585.828	20.854.761	883.793	18.195.220	23.077.372	13.623.832	6.402.421	6.180.093	4.549.079	21.407.674		
RENEWABLE		206.932.886		22.830.165	287.277.151	194.951.141	205.287.088	199.636.298	18.963.186	289.916.040	304.528.020	11.309.447	202.526.411	332.806.263	251.014.728	245.124.585	244.431.423	66.936.386	314.592.090		
NUCLEAR		16.802.034			19.549.453		63.370	63.370	8.851.650	14.877.622	26.378.385	9.452.250	15.185.474	26.115.591		82.485	82.485	4.262.252	20.159.693		
	Unknown	378.059			479.871		250.914		49.025		1.100.054	49.149		998.242	440.716	945.908		719	55.994		
	Solid - Unknown																				
	Solid - Hard coal				1.397.144		249.582	249.582	1.692.251		2.238.808	1.692.251	440.000	841.664	440.000		440.000		440.000		
	Solid - Brown coal																				
	Solid - Peat	368			368		368	368													
	Solid - Municipal solid waste	378.524		82.335	433.732		3.706	118.528	188.470	379.419	518.556	181.743	302.981	484.222		5.897	231.436	143.057			
	Solid - Industrial and commercial waste	16.788			19.969				2.548	43.335	45.709	1.706	43.335	46.770		9		9.389	48.270		
	Liquid - Unknown				5.060					5.060	5.060		5.060						1.853		
	Liquid - Crude oil				5.541		418	418	9.812		11.074	9.812		5.533							
	Liquid - Natural gas	84.952									16.903										
	Liquid - Petroleum products	21.730			24.404				20.495	1.910	27.116	20.353	1.910	26.778				22.075	887		
	Gaseous - Unknown	1.796		38										2		2					
	Gaseous - Natural gas	215.776		1.057	354.845	387.899	247.899	458.813	62.331	454.559	128.193	62.812	403.464	111.907	859.903	86.001	591.003	133.499	406.330		
	Gaseous - Coal-derived gas																				
	Gaseous - Petroleum products																				
	Gaseous - Municipal gas plant																				
	Gaseous - Process gas																				
	Heat - unknown																	100			
	Heat - Process heat																				
FOSSIL		1.097.993		83.430	2.720.934	387.899	752.887	827.709	2.024.932	884.283	4.091.473	2.017.826	1.196.750	2.515.118	1.740.619	1.031.920	1.037.000	397.118	1.096.391		
TOTAL		224.832.913	0	22.913.595	309.547.538	195.339.040	206.103.345	200.527.377	29.839.768	305.677.945	334.997.878	22.779.523	218.908.635	361.436.972	252.755.347	246.238.990	245.550.908	71.595.756	335.848.170		



## Forthcoming events

### 2015

2-4 Dec	Arnhem, The Netherlands	AIB General Meeting
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### 2016

3-4 March	Namur, Belgium	AIB General Meeting
8-9 March	Amsterdam, The Netherlands	RECs Market Meeting