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association of issuing bodies



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SYNOPSIS OF ARTICLES

AIB met in Denmark

AIB members experienced Danish hospitality in an ancient castle, the high-tech and welcoming headquarters of Energinet.dk and during the evening event, we experienced how to take strategic and tactical decisions in optimizing the operation of power generating companies.

Does the EU renewables sector need a Guarantees of Origin market?

To the AIB it was an honour to be invited to join the panel of the CEPS seminar on 27 September 2017, and here is a recap of the proceedings, written by the AIB President Dirk van Evercooren.

Are GOs a vital instrument for European consumers? The audience was diverse: whenever someone in the panel mentioned “consumer deception”, part of the audience nodded enthusiastically; but mentioning “consumer empowerment” did not receive an equivalent response.

Corporate supply chains – the next frontier for renewables

Internationally, the trend shows a great demand for renewable energy, and this trend is likely to accelerate further – among both private consumers, cities, and businesses. What is currently missing is a similar engagement among large industrial, energy intensive companies. Tom Lindberg writes about the RE100 initiative and an interesting study, which was recently conducted by the UK think tank InfluenceMap.

CertifHy – Designing the first EU-wide Green Hydrogen Guarantee of Origin for a new hydrogen market

CertifHy's aim is to create the path forward for a concrete and actionable Guarantee of Origin (GO) scheme for Green and Low Carbon Hydrogen with a pilot demonstration and the creation of a Stakeholder Platform. The first event took place on 20 November. For more information please read the article and visit www.certifhy.eu.

Statistics

The latest activity statistics, showing continued growth in the market and the effect of the introduction of new members. Again with the new method: the statistics will show a monthly summary by technology group per country.

The AIB and RECS International are pleased with the ‘Open Markets Committee’ (OMC), which was a successful gathering with an upbeat, cooperative vibe and interesting discussions. The event took place in Vienna, Austria, on 30 November and the presentations are available on the [AIB website](#).





AIB met in Denmark

AIB members experienced Danish hospitality in an ancient castle, the high-tech and welcoming headquarters of Energinet.dk and they became electricity generators CEO's for one evening

Energinet.dk hosted the General Meeting (GM) in Denmark on 21-22 September 2017, and planned the joint AIB team-event, mainly inspired by the GM in Germany in September 2016.

Last year, we learned about Prince Frederic Franz III (Leopold III), in Dessau who ran the smallest kingdom of Europe throughout the 17's century. He ruled in peace based on open principles and values like freedom and culture, with the philosophy: 'share knowledge – share success' attracting artists, philosophers, and scientists.

In Kolding, which is yet another small border town on one of Europe's many historical cross roads, Energinet.dk hosted the meeting in Exners reconstructed ruins of Koldinghus. Energinet.dk certainly enjoyed experiencing the enthusiasm from the attending members during the GM, Working Group meetings as well as sharing the knowledge of the team-event with everyone from all over Europe.

The GM in Kolding was nesting the spirit of corporation within the AIB on many levels, resulting in productive meetings. *"Thanks to you all who participated."* (Energinet.dk, Morten Hilger)

< Energinet.dk head office located in Fredericia

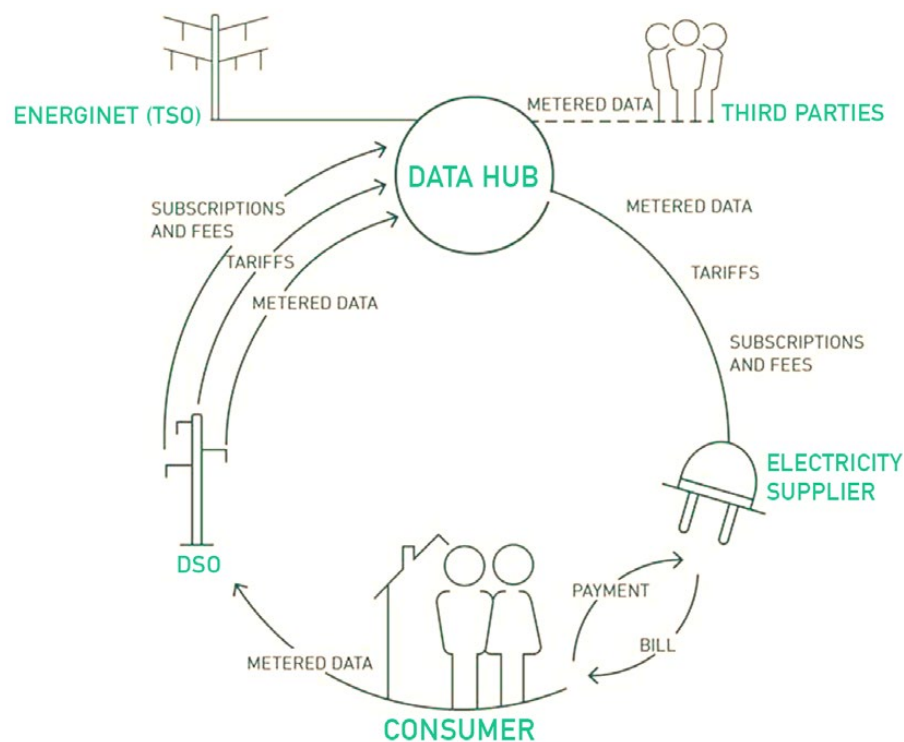
About Denmark and Energinet.dk

The energy system is changing. Europe is in the middle of a historic transition of the energy system – Denmark has a leading position: By 2020, wind power must constitute 50% of the electricity consumption; in 2016 it constituted 38%, the growth of e.g. biogas production is 43% GWh. In 2050, Denmark must be completely independent of fossil fuels. Since 2010, Denmark's electricity retail market has been going through a remarkable transformation. The overall purpose of the transformation is to stimulate competition, encourage innovation and to motivate the demand-side of the market to play an active role in Denmark's green transition.

Energinet.dk owns and operates the overall electricity and natural gas transmission system in Denmark. The tasks of Energinet.dk are to integrate renewable energy and ensure security of supply in Denmark. Energinet.dk is an independent public enterprise owned by the Danish Ministry of Energy, Utilities and Climate. At the beginning of 2017, the 1 000-employee mark was hit. Energinet.dk is based at eight locations, with the head office located in Fredericia.

An important pillar of Energinet.dk's work is a customer centric market model, and to proactively work on prosumer settlement to help integrating more green energy. Main approach is via a DataHub, which is an IT system, owned and operated by Energinet.dk. In addition to storing vast volumes of information about customers, consumption and prices, the DataHub handles all data communication between market participants in the electricity market.

>>



Data Hub of Energinet.dk

The DataHub handles data from the 'prosumers' – consumers who both produce and consume electricity. After an approval process, prosumers are allowed to sell their excess electricity to the grid. The net settlement of prosumers is made possible through advanced structures of metering points in the DataHub.

Approx. 117 000 of the Danish consumers are net settled:

- Approx. 26 000 with hourly netting
- Approx. 91 000 with yearly netting¹

¹ Only for renewable energy facilities and devices installed prior to 31-12-2013

The prosumers have one electricity supplier for their production and one for their consumption of electricity. For renewable energy production, the electricity supplier with the production obligation is the TSO (Energinet.dk), provided that the relevant plant has been approved for price subsidies. The electricity supplier delivering the electricity is chosen by the prosumer itself – giving the prosumer the same market terms as other consumers.

As a next step from 2020 smaller consumers will be hourly settled. Currently, hourly settlement is only mandatory for large consumers with a consumption above 100 MWh per year. The large consumers cover more than 50 % of the electricity consumed.

More information about Energinet.dk can be found in this [presentation](#) and on the [website](#).



“AIB members were surprised and very grateful for the unique possibility to visit the energy control centre of Denmark at Energinet.dk
Thank you to Energinet.dk”



AIB members become electricity generators CEO's for one evening

Issuing bodies experience how to take strategic and tactical decisions in optimizing the operation of power generating companies.

Travelling to Denmark, coming from all over Europe, and visit a small town instead of the capitol is a great experience in its own. But the third regular AIB meeting in 2017 had another opportunity for learning, team building and fun after a full day of work meetings: The Ensign Power Game.

Ensign Power Game lets you...

- Learn the basics on supply and demand curves using the electricity sector as an example
- Understand how the free market works - the market optimizes the total cost of electricity in socio-economic terms
- Learn how countries can share their infrastructure and optimize cost of electricity across interconnectors
- Learn about the effect of weather conditions such as wet, dry years and intermittent wind or solar resources
- ...



Ensign Games is a Danish company that focuses on developing fun and educational games for use in companies as well as schools and universities. And around 23 people from the member organisations of the AIB spend an interesting and fun evening.

"I think the game was such a success because it was insightful and fun, both to people who are really into the energy market and people who are not so familiar with the economic rational of this market." Says Max Laven who recently joined the team at CertiQ, in the Netherlands and is our newest member of Working Group External Affairs.

And Laura Plunkett from SEM-O in Ireland and our very active chair of Working Group Internal Affairs shares:

"Ensign was great at showing the fundamental interaction of supply and demand, the flexibility interconnection can offer, and both the positive and negative impact wind and rain conditions can have on your business. Teaming up with another AIB colleague really tested our influencing and negotiation skills when trying to agree and submit bids under time pressure. As with any game, it really brings out any natural competitive spirit... let's hope that didn't intimidate other AIB colleagues too much! A board game that is educational but still fun, nice one."



Does the EU renewables sector need a Guarantees of Origin market?



A recap of the CEPS seminar on 27 September 2017

Almost 18 months after the previous CEPS event dedicated to Guarantees of Origin (GO), a new seminar was organised, based on a new CEPS report on GOs, written by Jaap Jansen, who also co-wrote the CEPS report on the topic which accompanied the first event. The number of people who joined this meeting was considerably higher than at the previous meeting, most likely due to the discussions on the Clean Energy for all Europeans Package having entered into their final phase (but also because this time, there was no train strike ...). AIB was honoured to have been invited to join the panel, and here is a recap of the proceedings.

We heard from the author of the new CEPS 'policy insights' paper that "the GO can become a useful instrument to empower consumers to render the ... European energy mix more renewable". In order to realise this potential, a number of things need to be adjusted, says the paper. Reference was made to a perceived oversupply problem which it was feared would keep GO prices too low to have a real impact. Also, that issuing GOs for supported production would create a "double counting problem". These are both examples of common misconceptions that we have frequently debunked, but still emerge! In reality, the GO market has not only grown spectacularly, but demand (mostly driven by corporate buyers) has caught up with supply, so oversupply is a thing of the past – unless, of course, changes in policy cause the market to be flooded again. Issuing GOs for supported electricity does not cause double counting, as the producer does not claim the renewable origin, only the final consumer does this.

The European Commission's DG ENER representative, [Henrik Dam](#), presented the by now well-known proposals that started the Clean Energy Package discussions. He focussed on the need for GOs to create transparency and reliability for electricity consumers choosing a contract based on renewables.

Ole Lofsnæs of the Norwegian industry federation Norsk Industri repeated the same criticism as in the previous event, saying it makes no sense for more GOs than electricity to leave the country. A direct effect of restricting the number of Norwegian GOs leaving the country would, of course, lower the cost of green electricity for Norwegian industry ...

Claude Turmes, the green MEP, then proceeded to repeat his criticism that in his opinion GOs allow greenwashing (suppliers pretending to be greener than they really are by buying energy from fossil and nuclear producers and associating this with GOs for renewable energy) and do not provide additionality (meaning that they don't directly stimulate investment in new-build production based on renewable sources). He proposed to restrict the issuance of GOs such that they would only be received by a limited number of production facilities, and in particular new and unsupported production.

For the German government, [Andre Poschmann](#) said that GOs should not be issued to production that receives support, because the GO would then "transfer the value created by the taxpayer to other individuals". This would create the risk that the support system might lose credibility and therefore lose the support of the population.

He launched the idea of a European label to complement the GO and embody additionality, by contributing a small amount per MWh to a fund that would be used for new investments. This statement supports the views of the AIB that associating independent criteria schemes (ICSS) - labels – with GOs is the best way of ensuring additionality, and is most welcome.

Three testimonials from the floor then completed the messages from the panel, from a GO trader, a consumer organisation and an RE100 company. The ensuing [debate](#) followed the rather unfocussed panel discussion: a number of varying opinions, mixed with some misleading or actually incorrect 'facts', confirming the misconceptions that have plagued the debate on GOs during the past decade.

Did this event contribute anything to the understanding and advancement of the Guarantee of Origin as a vital instrument for European consumers and the internal energy market? I fear not... The debate seems to be stuck in a number of misconceptions, prejudices and outdated facts. Whenever someone in the panel mentioned "consumer deception", part of the audience nodded enthusiastically; but mentioning "consumer empowerment" did not receive an equivalent response. Strangely, even the consumer organisations seem to underestimate the capacity of consumers to actively participate in the energy transition and understand the principles behind the GO. It is therefore now time to finally address and overcome the perceived shortcomings of GOs, and thus focus stakeholders on the constructive and effective use of this great policy instrument!

Written by Dirk van Evercooren, AIB President

Corporate supply chains – the next frontier for renewables

Big corporations are moving towards more sustainable business models – and it won't be long before their value chains have to follow, writes Tom Lindberg.

At COP21 in Paris and following the launch of the UN Sustainable Development Goals, companies saw new and significant business opportunities in adapting to climate change, innovating business models to address global challenges, while becoming increasingly competitive.

This new foundation for growth is good for the climate and shareholders.

Many leading corporations “get the big picture”, and have already reduced their carbon footprint significantly. At the opening of the Climate Week in New York City in September 2017, Anne Finucane, vice chair at the Bank of America, underlined the business case for big banks to transition to 100% renewable electricity. “We’re all making money at it,” she said, “you will see greater investment in renewables because we see business there.”

Today, 111 of the world's most influential companies have committed to 100% renewable electricity through the initiative RE100, and the number of members is growing fast. Together, these companies are creating a demand of more than 150TWh of renewable electricity, more than enough to power the entire New York State. RE100 is a collaborate initiative uniting global brands committed to 100% renewable power, many of them as soon as 2020. These companies have made a public pledge, and further disclose their progress to RE100 on an annual basis. The latest companies to join RE100 are The Estee Lauder Companies, DBS Bank, Kellogg Company and JP Morgan Chase & Co.

A recent study, conducted by the UK think tank [InfluenceMap](#), shows that companies like Apple, Unilever and IKEA are among the top three most influential companies globally that are pushing for ambitious climate policies aligned with the Paris Agreement. These three companies are also part of RE100. But, the study also found that a significant number of global industrial corporations are still sitting on the fence – and that 35 of the 50 most influential companies are even actively lobbying against widely accepted global climate policies. The companies include ExxonMobile, Valero Energy, Chevron from the fossil fuel value chain, in addition to powerful automotive manufacturers like Fiat Chrysler, Ford, and Daimler among others.

Purchasing tracked and documented renewable electricity from the grid, or from specific renewable projects, is often the easiest and most effective way for a company to address sustainability. In September, General Motors announced a new [200MW wind energy deal](#) that will power manufacturing plants in the US, and bring the company's renewable energy coverage up to 20% of all electricity used in 2018. This is clearly a step in the right direction.

RE100 will gain even further momentum when memberships reach even higher levels. But, I am certain that what will really transform this from a movement to “a torrent” is when we see more of the ambitious RE100 members starting to push their own renewable targets down their value chains. This will start a chain reaction resulting in thousands of supplying companies – large and small – being “forced” to reflect the same ambitious targets as their customers have.

Internationally the trend shows a great demand for renewable energy, and this trend is likely to accelerate further – both among private consumers, cities, and businesses. What is currently missing, is the same engagement among large industrial, energy intensive companies. There are definitely good exceptions, but still a large number of them are still undecided in how to approach setting ambitious enough renewable targets. Many of these companies, unlike the majority of RE100 members, are not well-known consumer brands, but rather 2nd or 3rd tier supplying companies.

I believe pressure from the RE100 members toward their most critical suppliers, will soon spur also the large industrials to adopt a different sense of urgency than we have seen so far. To further entice the large industrial energy intensive companies, RE100 may consider providing more industry specific paths to reaching 100% renewable consumption.

Hundreds of companies globally now recognise that the transition to a low-carbon economy is the only way to secure sustainable economic growth. Although this is still a fairly limited number of companies, these leading businesses are clearly paving the trail for others to follow.

The corporate world, stepping up its purchase of, and investments in renewable energy, will contribute significantly to accelerating the global transition from fossil to renewable power.

Tom Lindberg is managing director of [ECOHZ](#), a corporate energy consultancy based in Oslo, Norway.

This Article was published in [RECHARGE](#) on 12 October 2017.

RECHARGE
The global source for renewable energy news & intelligence

ECOHZ

Designing the first EU-wide Green Hydrogen Guarantee of Origin for a new hydrogen market

Taking Europe-wide green and low carbon hydrogen Guarantees of Origin (GO) to the next level: **from concept to implementation**. This is the objective of the **CertifHy project** undertaken by a consortium led by HINICIO, composed of ECN, GREXEL, Ludwig Bölkow System Technik (LBST), and TÜV SÜD and financed by the FCH 2 JU.

CertifHy's aim is to create the **path forward for a concrete and actionable Guarantee of Origin (GO) scheme for Green and Low Carbon Hydrogen with a pilot demonstration** and the **creation of a Stakeholder Platform**. The project will define the green hydrogen GO scheme, its governance, processes and procedures over the entire GO life cycle: from auditing hydrogen production plants, certification of green or low carbon hydrogen production batches, through issuing, trading to "usage" of GOs.

The **CertifHy pilot** will deliver a **realistic, detailed and rapidly deployable European-wide green and low carbon hydrogen GO scheme**. The pilot covers, from the production side, four plants located in Belgium, France, Germany and the Netherlands covering different production pathways. It will demonstrate how the system will work under real life conditions and provide lessons learnt for a future European-wide deployment.

To support the implementation of the GO scheme by bringing together all interested stakeholder, gather momentum and provide legitimacy to the **GO scheme** a Stakeholder Platform, a Steering Group and Working groups have been set up during the first plenary session on November 20th in Brussels, with 100+ members from industry, policy makers, standardization and issuing bodies, associations, SMEs, research and academia to design the 1st EU-wide Green Hydrogen Guarantee of Origin (GO) system.

For more information please visit www.certifhy.eu and contact [Joel Neave](#).

The Secretary General of AIB, Phil Moody, was chosen to be the chair of the CertifHy working group about Guarantees of Origin. We are pleased about this trust and look forward to this collaboration.



FUEL CELLS
AND HYDROGEN
JOINT UNDERTAKING

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.

Further data is available on our [website](#).

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 13th November 2017 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 between 4th October and 13th November on the following days

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, HR, IE, IS, LU, NO and SE) provide all required information. 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 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).

Country	Collected	Source
Austria	17 October 2017	website (password protected)
Belgium - Federal	09 October 2017	spreadsheet provided by CREG
Belgium - Brussels	20 October 2017	spreadsheet provided by Brugel
Belgium - Flanders	27 October 2017	spreadsheet provided by VREG
Belgium - Wallonia	15 October 2017	spreadsheet provided by CWaPE
Croatia	17 October 2017	website
Cyprus	17 October 2017	Not yet available
Czech Republic	11 October 2017	spreadsheet provided by OTE
Denmark	17 October 2017	website
Estonia	18 October 2017	spreadsheet provided by Elering
Finland	04 October 2017	spreadsheet provided by FinExtra
France	09 October 2017	spreadsheet provided by Powernext
Germany	13 November 2017	website
Greece		Not yet available
Iceland	17 October 2017	website
Ireland	17 October 2017	website
Italy	13 October 2017	spreadsheet provided by GSE
Luxembourg	17 October 2017	website
Netherlands	09 October 2017	spreadsheet provided by CertiQ
Norway	18 October 2017	website
Portugal		Not yet available
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	23 October 2017	spreadsheet provided by CNMC
Sweden	10 October 2017	website and link
Switzerland	19 October 2017	website (password protected)

Please note

New data

The latest version of the statistics now provides:

- Relating to electricity produced during a specific year: the number of certificates issued, expired and cancelled
- Relating to the date when transactions actually took place: the number of certificates transferred, exported, imported, expired and cancelled.

The number of domestic and international certificate transfers have not been reported by production year, as this information does not seem to have a use. For the same reason, the number of certificates actually issued during each month is not reported.

Fuels

The fuels displayed reflect those used by member registries, normally at the most detailed level. Due to the more detailed information now being kept, some information is at a high level. For instance, "Solid - unspecified wood" might contain forestry products, energy crops and so on. Similarly, "liquid - renewable fuels" may contain black liquor. However, when this has been recorded, then it is displayed as such. Hopefully, over time, all registries will provide information at the more detailed level, enabling more accurate analysis.

As other certificates are issued for fuels not on the current list, so these categories will be added and reported against.

Missing and seemingly contradictory data

A further point for consideration is that the new data has only been collected by registries since last year, so it will be absent in earlier data; and for those countries where the registries have yet to capture and report this information. However, given the recent restriction on the lifetime of certificates, this matter should be corrected in the next year or two.

This explains a number of anomalies - for instance, the difference between the total number of certificates cancelled for all production years, and the total number of certificates cancelled by year of transaction: while all registries report when certificates are cancelled; not all registries report the production year to which they relate.

Production and Transaction statistics

Production statistics refer to the month and year when the electricity was produced, whereas Transaction statistics refer to the month and year when the transaction took place.

Thus Production → issue is the number of GOs issued for electricity produced in a specific month, while Transaction → issue is the number of GOs issued during a specific month, regardless of when the associated electricity was produced (note that GOs are issued one or more months after the electricity is produced).

Similarly, Production → cancelled is the number of GOs cancelled which relate to electricity produced in a specific month, while Transaction → cancelled is the number of GOs cancelled during a specific month, regardless of when the electricity was issued.

For each of the above (Production and Transaction):

- Issue = GOs created in a month for electricity produced in an earlier month
- Transfer = GOs transferred within a country or region
- Export = GOs transferred to another country
- Import = GOs transferred from another country
- Cancel = GOs which have been made non-transferrable by the holder of the account in which they reside (or its agent)
- Expire = GOs which relate to electricity produced more than a year ago, and which have consequently been cancelled.

Statistical report

During the third quarter of 2017, market activity continued to increase, as has the use of guarantees of origin (GOs) 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:

- 1. **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.
- 2. **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.

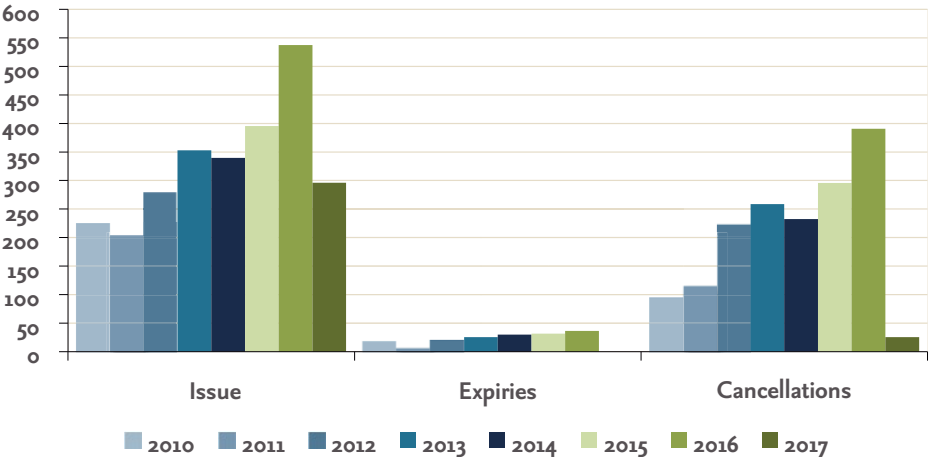
Further growth is expected as new countries are connected to the Hub, and as activity increases within existing members.

Note that Cyprus continues to test its registry against the AIB Hub and has yet to commence issuing.

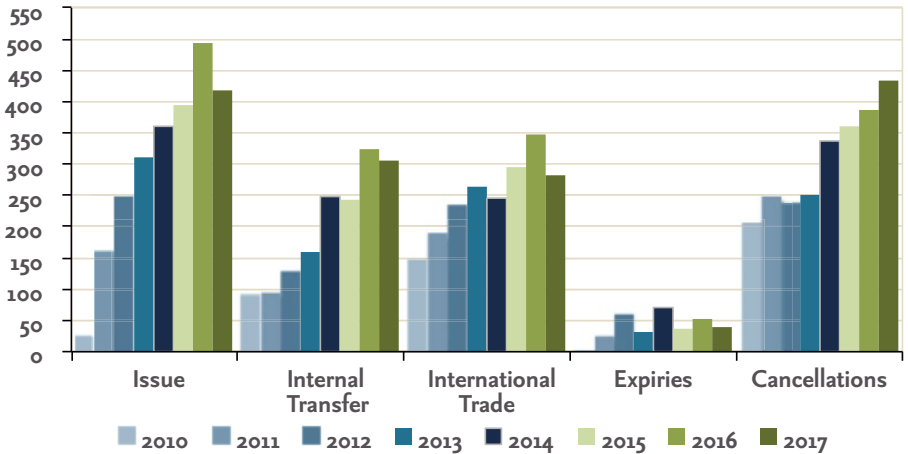
Energimyndigheten of Sweden recently gained membership, and is gradually replacing Grexel over the remainder of 2017. LAGIE of Greece and Litgrid of Lithuania have applied for membership, and will probably become active next year.

Ofgem of the United Kingdom, RES Operator of Bosnia and Herzegovina, Elektromreža Srbije of Serbia, AST of Latvia and DGEG of Portugal are official observers; and contact continues with interested parties in Poland, Kosovo, Hungary, Slovakia and Montenegro. Turkey is showing an interest in implementing a compatible system of GOs.

Annual EECS transactions by production date (TWh)



Annual EECS transactions by transaction date (TWh)



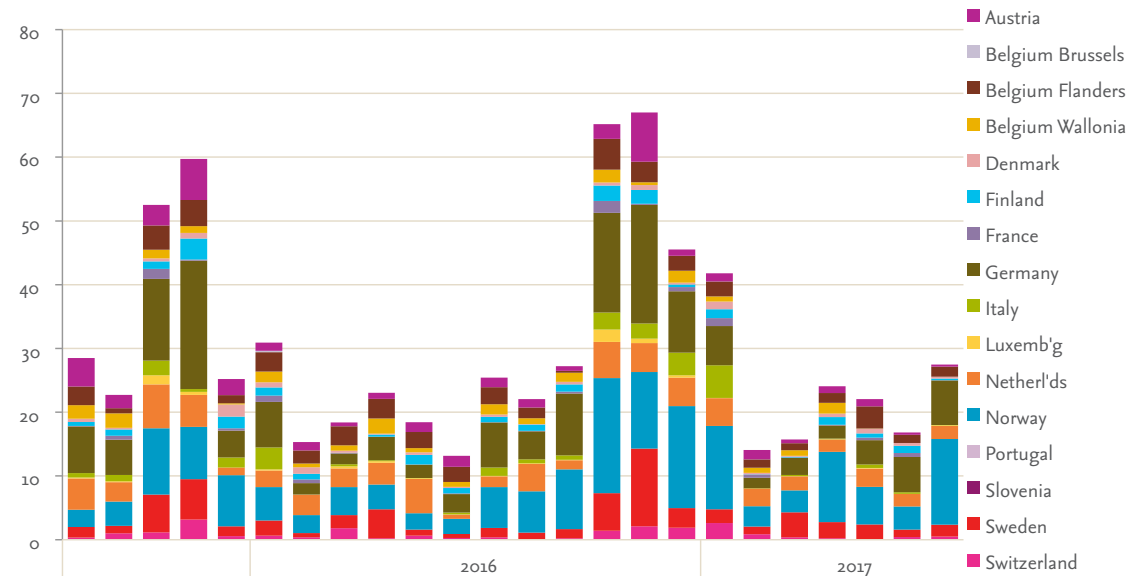
The number of cancellations continue to grow, and 2017 has already exceeded the previous years' record levels, demonstrating the increased use of GOs for purposes of selling products for differentiated energy sources. Note that issuing tends to be 20% understated over the past quarter, due to delays in capturing metering data, so the number of issued GOs will doubtless top last years.

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.

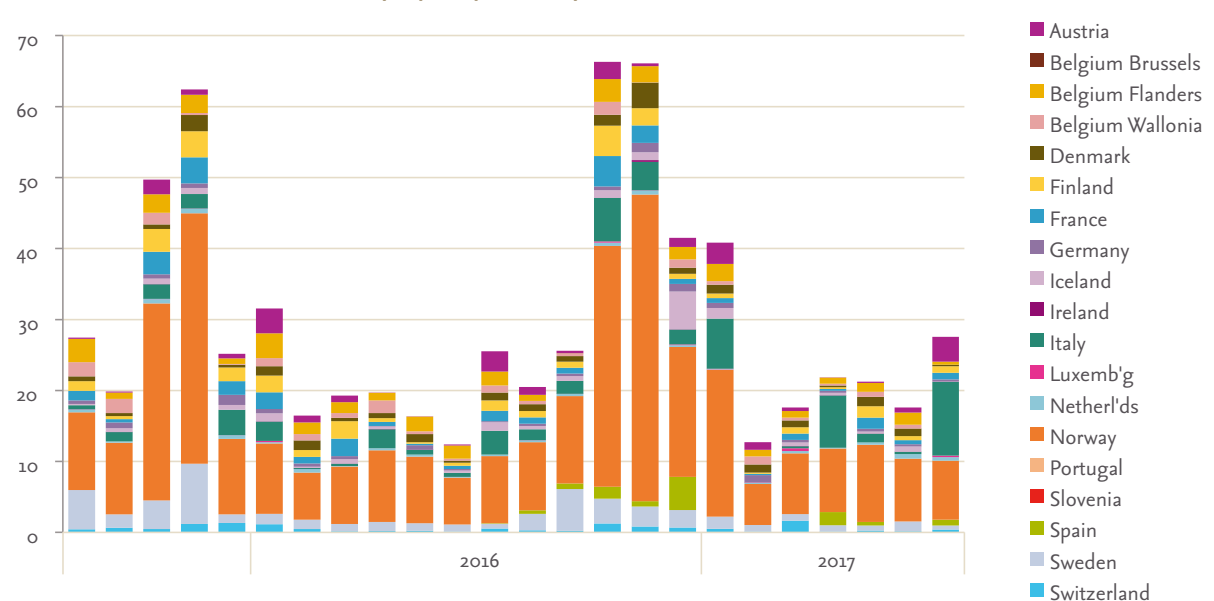
In 2016, Norway, Belgium, Sweden, Italy and France were the major exporters; while Germany, Norway, Belgium, Netherlands and Sweden were the main importers. So far in 2017, the major exporters have been Norway, Italy, France and Belgium; while Norway, Germany, Sweden, Belgium and Netherlands have been the main importers. During both years, some countries figure in both exports and imports, suggesting trading activity.

These charts show the large role that the Nordic region has in this market, and the interest in renewable products elsewhere in Europe, particularly Germany and Benelux.

Monthly imports per country (TWh)



Monthly exports per country (TWh)



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 - less than one percent of all EDCs are between member countries. 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.

EDCs can and do occur between member countries and non-member countries, to the extent that in 2017, almost 99 percent of all EDCs went to non-member countries in Europe, only half a percent of EDCs being used outside of Europe. The following table gives an indication of the countries for which ex-domain cancellations were executed in 2017.

Ex-Domain Cancellations by Country : 2016										
Destination	Source									
	CH	DK	EE	FI	FR	IE	NO	SE	SI	TOTAL
Albania	0	0	0	0	0	0	445	0		445
Algeria	0	0	0	0	0	0	558	0		558
Australia	0	0	0	0	0	0	5.284	0		5.284
Austria	129	0	0	0	0	0	0	0		129
Bosnia	0	0	0	0	0	0	5	0		5
Brazil	0	0	0	0	0	0	37	6.670		6.707
Bulgaria	0	0	0	0	0	0	28.976	0		28.976
Chile	0	0	0	0	0	0	183	0		183
China	0	0	0	0	0	0	332	0		332
Cyprus	0	0	0	0	0	0	325	0		325
Czech Republic	71.280	0	0	0	0	0	11.222	6.125		88.627
Denmark	3.590	0	0	0	0	0	0	0		3.590
France	55.969	0	0	0	0	0	0	0		55.969
Germany	233.609	0	0	0	0	0	0	0		233.609
Greece	0	0	0	0	0	0	83.760	0		83.760
Hungary	81.927	0	0	10	0	0	85.211	0		167.148
India	0	0	0	0	0	0	0	18		18
Israel	0	0	0	0	0	0	1.224	0		1.224
Italy	360.598	0	0	0	0	0	0	0		360.598
Japan	0	0	0	0	0	0	1.644	0		1.644
Latvia	0	0	1.221.431	150	0	0	7.345	304.404		1.533.330
Lithuania	0	0	1.327.678	0	0	0	42.880	0		1.370.558
Luxembourg	600	0	0	0	0	0	0	0		600
Malta	0	0	0	0	0	0	100	0		100
Norway	14.598	0	0	0	0	0	0	0		14.598
Oman	0	0	0	0	0	0	395	0		395
Poland	4.100	0	0	0	54.212	0	474.191	18.027		604.742
Portugal	0	0	0	0	6.950	0	196.849	0		203.799
Qatar	0	0	0	0	0	0	1.436	0		1.436
Romania	0	0	0	10	40.483	0	22.993	0		63.486
Russia	0	0	0	2.141	0	0	29.017	0		31.158
Saudi Arabia	0	0	0	0	0	0	3.158	0		3.158
Serbia	0	0	0	0	0	0	13.661	0		13.661
Singapore	0	0	0	0	0	0	249	0		249
Slovakia	700.131	700.521	0	7.500	268.824	0	631.290	578.491		2.886.757
Slovenia	4.730	0	0	0	0	0	0	0		4.730
South Africa	0	0	0	0	0	0	2.705	0		2.705
South Korea	0	0	0	0	0	0	1.576	0		1.576
Spain	0	45.500	0	0	4.500	0	40.580	712		91.292
Sweden	0	0	0	0	0	0	220.000	0		220.000
Turkey	0	0	0	0	0	0	0	5.170		5.170
UK	9.739.562	5.115.793	85.390	151.274	4.252.195	961.872	8.538.323	8.396.635	122.516	37.363.560
Ukraine	0	0	0	0	0	0	187	0		187
United Arab Emirates	0	0	0	0	0	0	4.550	0		4.550
United States	0	0	0	0	0	0	113.824	0		113.824
TOTAL	11.270.823	5.861.814	2.634.499	161.085	4.627.164	961.872	10.564.515	9.316.252	122.516	45.574.752

EDCs to member countries	Ex-Domain Cancellation between NO and SE due to cancellation erroneously done in Norwegian registry with country of consumption= Norway. During calculation of national disclosure, it was discovered that cancellation was done on behalf of a Swedish company, so the country was changed in the database. Routines have since then been changed to avoid such errors.										
	Ex-domain cancellations to CY from NO; and to ES from DK, FR, NO and SE: linkage to Cyprus registry was not yet in place.										
	Ex-domain cancellations to CZ from CH and NO: linkage to Czech registry suspended due to EECS Rules infringement, which has now been rectified.										
	Ex-domain cancellations to AT, DE, DK, FR, IT, LU, NO and SI from CH: reason unclear, as these are all connected member countries										

	TOTAL		Q1		Q2	Q3				Q4	
EDCs to member countries	1.073.742	2,36%	275.732	3,12%	589.407	2,16%	37		0,00%	208.566	4,49%
EDCs to European non-member countries	44.320.839	97,25%	8.513.955	96,39%	26.666.444	97,79%	4.732.422		98,02%	4.408.018	94,92%
EDCs to Europe	45.394.581	99,60%	8.789.687	99,51%	27.255.851	99,95%	4.732.459		98,02%	4.616.584	99,41%
EDCs outside of Europe	180.171	0,40%	43.163	0,49%	13.600	0,05%	95.697		1,98%	27.316	0,59%
EDCs to unknown destination	-	0,00%	-	0,00%	-	0,00%	-		0,00%	-	0,00%
	45.574.752		8.832.850		27.269.451		4.828.156			4.643.900	

In 2016, 97 percent of all EDCs went to non-member countries in Europe, and less than half a percent of EDCs being used outside of Europe.

The following table gives an indication of the countries for which ex-domain cancellations were executed in 2016.

Note that in some instances, EDCs took place between member countries where technical issues prevented transfer of GOs.

DESTINATION	SOURCE							
	CH	DK	EE	FI	FR	NO	SE	TOTAL
Albania	0	0	0	0	0	87.539	0	87.539
Belarus	0	0	0	30	0	0	0	30
Belgium Flanders	0	0	0	0	0	15.000	0	15.000
Bosnia	0	0	0	0	0	5	0	5
Brazil	0	0	0	0	0	1.000	0	1.000
Bulgaria	0	0	0	0	0	21.955	0	21.955
Chile	0	0	0	0	0	1.002	0	1.002
Cyprus	0	0	0	0	0	0	471	471
Czech Republic	0	0	0	1.465	0	2.226	0	3.691
Greece	50.665	0	0	0	0	42.825	0	93.490
Hungary	250.167	0	0	15.201	0	173.722	0	439.090
Latvia	0	0	855.731	0	0	8.591	0	864.322
Lithuania	0	0	997.182	0	0	295.624	0	1.292.806
Morocco	0	0	0	154	0	0	0	154
Poland	4.100	0	0	0	0	559.446	7.000	570.546
Portugal	629	0	0	0	0	0	209.787	210.416
Romania	0	0	0	0	0	37.749	0	37.749
Russia	0	0	0	6.000	0	78.288	0	84.288
Saudi Arabia	0	0	0	0	0	5.393	0	5.393
Serbia	0	0	0	0	0	16.898	0	16.898
Slovakia	275.643	232.000	0	0	658.237	641.627	89.280	1.896.787
Thailand	0	0	0	0	0	504	0	504
Turkey	0	0	0	0	0	4.000	0	4.000
UK	3.395.250	3.505.251	0	0	0	9.098.814	3.995.813	19.995.128
Ukraine	0	0	0	0	0	2.257	0	2.257
United Arab Emirates	0	0	0	0	0	39	0	39
United States	0	0	0	0	0	46.000	0	46.000
TOTAL	3.976.454	3.737.251	1.852.913	22.850	658.237	11.140.504	4.302.351	25.690.560

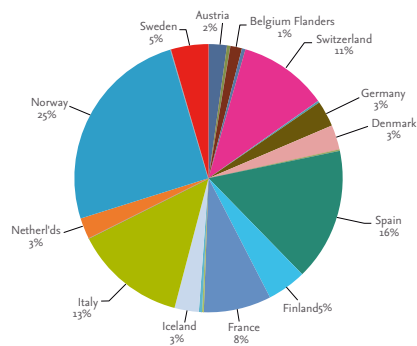
EDCs to member countries	Ex-domain cancellations to CZ from FI: linkage to Czech registry suspended due to EECS Rules infringement, which has now been rectified.
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	TOTAL		Q1		Q2		Q3		Q4	
EDCs to member countries	18.691	0,07%	3.691	0,06%	15.000	0,09%	-	0,00%	-	0,00%
EDCs to European non-member countries	25.529.459	99,37%	6.286.566	98,68%	15.848.399	99,83%	1.992.803	97,60%	1.401.691	99,99%
EDCs to Europe	25.548.150	99,45%	6.290.257	98,74%	15.863.399	99,92%	1.992.803	97,60%	1.401.691	99,99%
EDCs outside of Europe	141.876	0,55%	80.307	1,26%	12.384	0,08%	49.000	2,40%	185	0,01%
EDCs to unknown destination	-	0,00%	-	0,00%	-	0,00%	-	0,00%	-	0,00%
TOTAL	25.690.026		6.370.564		15.875.783		2.041.803		1.401.876	

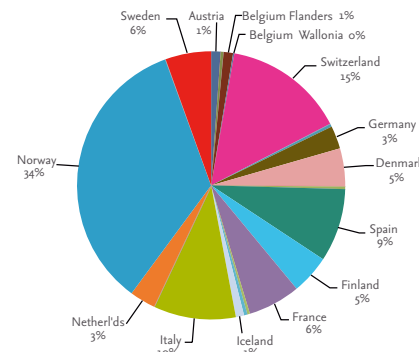
The following graphs are based on specific “vintages” of certificate (i.e. associated with electricity produced in a particular year), and show the final destination of GOs associated with electricity produced by each member country in a year.

For renewables, hydropower remains by far the prevalent supplied renewable energy source, followed by wind and then biomass.

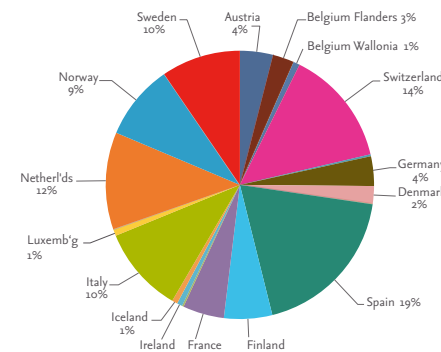
2016 Issue



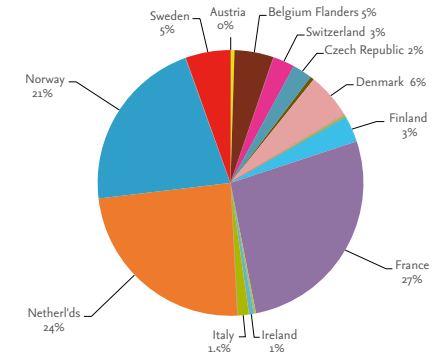
2017 Issue



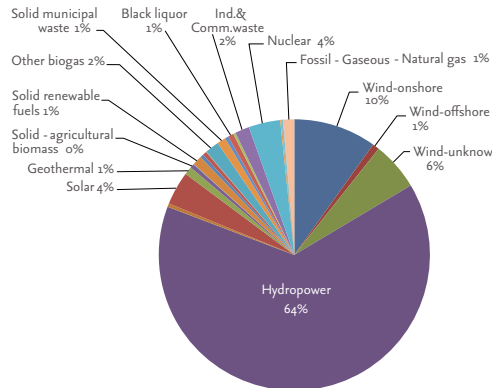
2016 Cancel



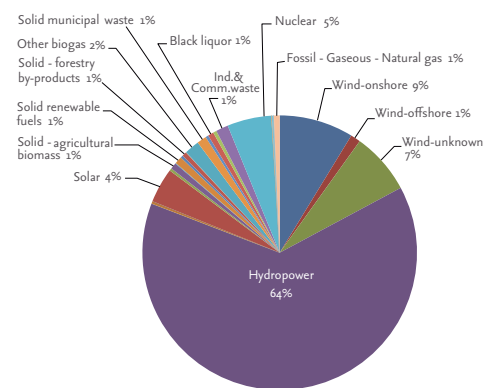
2017 Cancel



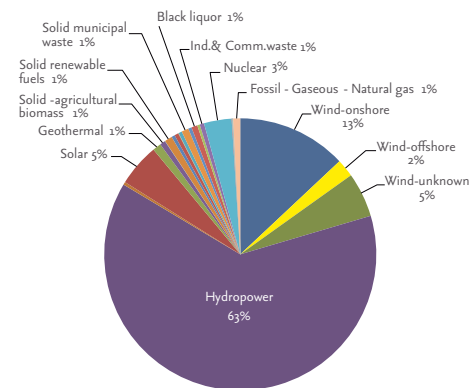
2016 Issue



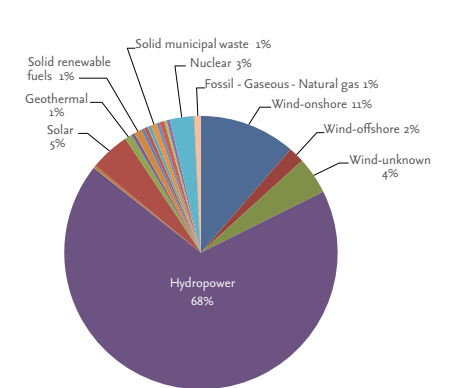
2017 Issue



2016 Cancel



2017 Cancel



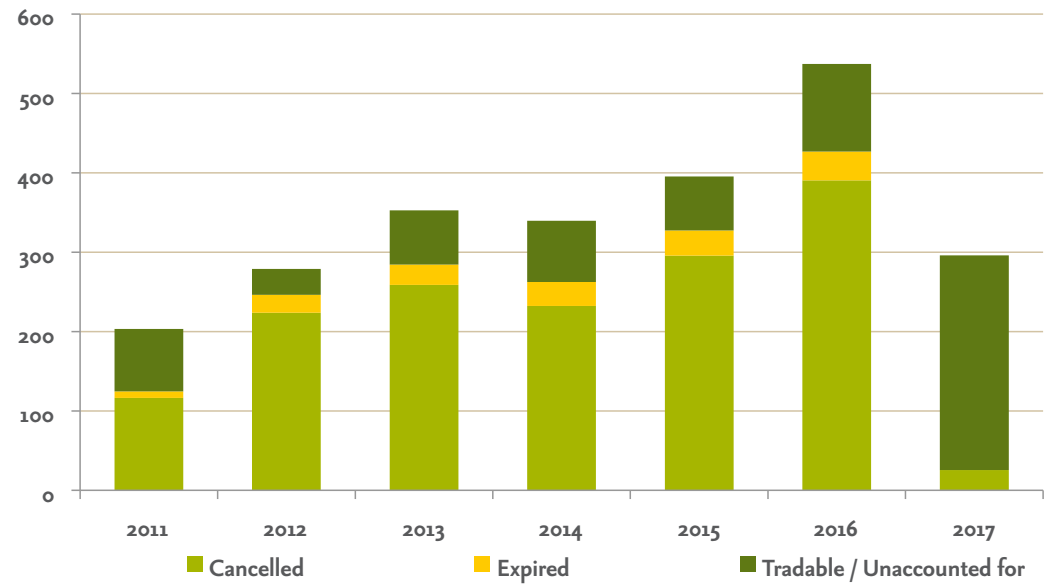
Comparing the status of different vintages of EECS certificate, we can see what has happened to the certificates that were issued for energy produced in the last four years - that is, whether the certificates have:

- 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.

Usage of EECS Certificates



Proportion of EECS Certificates available



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 2016 until the date of collection of

the data (during October/November 2017 – 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 2017									2015 to 2017								
	Production			Transaction						Production			Transaction					
	Issue	Expire	Cancel	Issue	Transfer	Export	Import	Expire	Cancel	Issue	Expire	Cancel	Issue	Transfer	Export	Import	Expire	Cancel
Austria	71.689.004		104.720.272	74.627.226	134.422.102	92.422.219	166.625.295		137.180.512	25.751.339		38.086.645	31.843.806	53.058.290	37.800.103	59.962.464		55.524.634
Belgium (Federal)	5.181.188			5.303.814		5.236.922				5.181.188			5.303.814		5.236.922			
Belgium Brussels	326.843		213.062	77.388	11.154.044	14.800	11.743.543	5.390	22.716.026	240.650		161.316	77.388	8.069.296		853.557	5.390	7.929.206
Belgium Flanders	44.481.907	11.718.499	57.578.071	29.859.241	86.360.668	111.587.828	259.427.871	9.261.593	163.598.512	18.651.903	5.297.822	23.792.732	12.528.960	44.278.520	51.927.251	73.243.938	4.047.036	31.401.065
Belg & Lux RECS	113.390						2.031.496		2.048.355									
Belgium Wallonia	12.595.061	77.885	6.919.046	7.096.093	49.989.811	33.099.654	94.358.277	1.689.297	57.136.898	4.796.225	77.885	4.370.808	4.850.652	25.625.743	22.851.222	33.434.878	1.133.598	12.229.078
Belgium	62.698.389	11.796.384	64.710.179	42.336.536	147.504.523	149.939.204	367.561.187	10.956.280	245.499.791	28.869.966	5.375.707	28.324.856	22.760.814	77.973.559	80.015.395	107.532.373	5.186.024	51.559.349
Switzerland	324.192.569	51.428.984	249.814.897	325.672.825	102.015	38.472.403	64.013.364	99.354.675	273.534.870	161.515.601	19.909.248	110.886.362	168.434.380		19.586.901	30.360.802	39.350.157	164.171.565
Cyprus	255.685			239.984				179.188		255.685			239.984				179.188	
Czech Republic	3.491.855	272.678	4.324.270	3.491.855	2.857.369	574.956	1.931.831	272.678	4.324.270	2.327.393	58.782	3.174.942	2.436.626	1.815.769	574.956	1.925.494	115.268	3.542.258
Germany	85.833.051	5.019.814	189.049.177	84.422.939	283.182.498	38.581.875	511.174.067	12.264.383	512.973.036	42.629.785	788.456	25.965.287	47.505.649	130.524.561	18.066.816	217.686.777	8.143.872	257.118.853
Denmark	106.929.102	8.489.743	45.812.091	97.134.412	42.010.290	66.879.470	27.940.537	8.489.743	47.638.536	46.118.560	937.143	21.938.740	49.506.174	23.323.576	31.848.618	17.121.046	3.794.883	28.651.265
Estonia	2.790.712		404.119	5.048.846	7.392.348	2.053.679	4.136.240	914.621	2.804.006	2.604.228		347.129	4.840.350	7.392.348	2.053.679	4.136.240	866.857	2.703.873
Spain	126.651.294	3.129.610	73.377.630	115.404.189	80.232.229	17.736.460	1.466.623	3.129.610	81.329.461	111.965.152	3.129.610	73.377.630	111.969.036	80.232.229	12.327.250	1.408.243	3.129.610	74.785.873
Finland	206.352.199	8.204.086	131.720.389	144.817.939	54.267.863	220.852.434	194.291.212	8.198.847	147.121.159	64.447.748	156.677	43.432.841	69.555.177		42.613.608	36.777.552	479.557	58.584.830
France	182.895.225	14.540.322	67.562.700	160.207.671	21.683.629	89.720.713	34.501.476	19.286.076	114.773.024	91.540.705	853.330	38.250.011	100.554.271	9.057.101	64.854.659	12.526.579	2.506.596	43.367.750
Croatia	2.203.877	32.797	996.765	2.203.877	852.846	313.239	151.870	32.797	996.765	2.203.877	32.358	974.191	2.203.877	852.846	313.239	151.870	32.797	996.765
Ireland	5.732.793	34.231	5.538.886	5.570.379	2.497.271	505.209	1.863.561	34.231	5.538.886	5.570.379	34.231	5.537.982	5.570.379	2.497.271	495.208	1.863.561	34.231	5.538.886
Iceland	56.420.080	1.003.048	4.014.159	56.420.080	6.822.683	51.295.548	1.046.983	1.003.048	4.014.159	25.193.970	15.942	3.685.465	27.955.041	5.816.096	23.395.656	28.540	38.913	3.691.166
Italy	224.212.296	31.225.513	101.695.057	202.067.127	282.298.665	82.657.068	52.165.897	52.824.079	198.322.275	136.205.188	29.791.235	72.853.320	160.695.893	209.456.130	69.673.583	35.066.782	51.243.069	113.159.298
Luxembourg	424.778	431.795	17.738.375	424.778	7.378.773	2.203.404	20.061.085	431.795	17.738.375	337.433	22.720	6.437.247	364.657	3.518.544	1.438.199	9.855.117	135.474	9.963.166
Netherlands	135.365.956	5.141.944	223.888.149	49.830.126	91.923.547	35.202.945	321.232.115	5.141.955	398.426.423	36.194.616	788.233	99.009.776	38.213.766	22.659.651	11.142.818	99.039.134	2.273.390	124.616.363
Norway	1.338.987.007	65.200.096	177.731.173	862.938.336	533.762.271	1.142.392.838	294.223.145	65.200.096	314.995.370	372.512.908	5.241.181	72.454.737	379.958.031	221.340.934	440.892.430	206.176.654	7.384.234	96.541.590
Portugal	1.455.576		422.472	477.440		1.064.056	371.468		487.048						11.800	155.963		205.659
Sweden	445.607.178	28.558.971	212.787.338	180.485.913	41.332.063	226.333.606	219.072.950	28.555.703	390.070.082	72.316.855	903.032	66.910.227	81.336.988	23.057.633	72.912.605	83.572.851	1.808.293	85.923.952
Slovenia	4.002.666					668.004	117.018		1.927.200									
UK	90.158																	
TOTAL	3.388.281.450	234.510.016	1.676.308.098	2.413.822.478	1.740.522.985	2.259.869.330	2.283.947.924	316.269.805	2.899.695.248	1.228.561.388	68.037.885	711.647.388	1.305.944.899	872.576.538	930.017.523	925.348.042	126.702.413	1.180.647.095

Issuing, Trade & Redemption for All Fuels																		
	2017									2016								
	Production			Transaction						Production			Transaction					
	Issue	Expire	Cancel	Issue	Transfer	Export	Import	Expire	Cancel	Issue	Expire	Cancel	Issue	Transfer	Export	Import	Expire	Cancel
Austria	3.366.218		11.890	9.601.774	16.229.194	10.809.767	15.190.086		15.201.294	11.852.156		15.581.114	10.505.930	20.528.469	13.713.446	22.274.692		21.826.108
Belgium (Federal)	1.001.172			1.446.238		1.379.346				2.116.702			2.377.838		3.136.152			
Belgium Brussels	56.141		111.021		3.230.662		10.146		2.510.618	109.828				3.148.349		219.576	5.390	3.026.305
Belgium Flanders	3.352.784		1.208.527	3.487.809	9.527.046	12.556.105	18.134.723	1.502.729	9.506.392	7.493.604	2.216.229	10.045.537	4.183.694	16.032.749	20.983.837	30.908.800	1.647.173	13.296.574
Belg & Lux RECS																		
Belgium Wallonia	460.170		9.429		7.848.489	4.762.730	6.659.648	240.300	2.941.633	2.333.747	48.749	3.030.503	2.698.096	11.476.459	9.253.225	14.111.041	345.557	5.748.727
Belgium	4.870.267		1.328.977	4.934.047	20.606.197	18.698.181	24.804.517	1.743.029	14.958.643	12.053.881	2.264.978	13.076.040	9.259.628	30.657.557	33.373.214	45.239.417	1.998.120	22.071.606
Switzerland	43.208.716		665.705	47.708.202		4.870.299	9.189.518	8.997.185	53.167.189	57.811.309	8.053.660	54.704.525	58.393.123		7.174.309	9.824.606	12.877.045	54.805.015
Cyprus	159.505			161.063				179.188		96.180			78.921					
Czech Republic	1.007.938		614.525	1.635.662	597.323	574.956	142.264	28.634	962.480	1.197.792	28.632	900.321	620.696	140.544		127.470	44.053	1.482.914
Germany	8.177.098		118.076	13.262.636	33.828.565	5.835.902	57.074.486	1.250.200	85.514.391	16.775.468	152.864	13.937.876	14.621.681	46.500.291	5.861.011	80.298.053	2.607.135	84.018.233
Denmark	13.615.499		1.437.730	15.674.381	4.796.474	10.811.450	4.729.647	311.967	6.234.518	15.961.335	278.758	8.316.384	16.037.121	9.332.608	12.395.134	6.974.355	713.715	8.187.816
Estonia	899.680		87.949	1.553.494	2.546.519	655.594	1.545.178	203.722	1.553.382	988.440		205.456	1.691.639	3.493.588	653.583	2.320.143	186.553	903.607
Spain	26.141.869			64.473.799	60.931.612	9.165.143	1.255.000	3.129.610	74.785.873	85.823.283	3.129.610	73.377.630	47.495.237	19.300.617	3.006.144	153.243		
Finland	13.961.683		800.737	19.719.188		8.182.138	7.281.817	88.209	16.511.353	25.357.814	84.522	22.693.829	24.908.710		20.017.954	15.293.104	86.552	21.244.834
France	18.723.103		6.855.832	34.398.198	2.588.330	18.763.890	3.872.319	1.161.864	18.012.507	43.732.095	323.552	19.468.096	39.816.428	3.145.661	24.955.943	4.763.106	529.778	15.831.644
Croatia	923.265		72.962	1.532.163	831.888	176.952	30.357	24.914	858.119	1.145.653	24.914	785.657	603.336	20.958	136.287	98.500	7.444	116.072
Ireland	1.210.784		145.383	1.418.035	897.942	387.870	754.293	34.221	2.066.480	2.038.069	28.080	2.533.561	2.176.944	1.404.524	93.300	797.268	10	3.080.981
Iceland	2.941.007		4	12.310.306	1.961.511	9.972.979	3.540	14.670	2.583.179	15.744.320		2.583.175	9.196.668	1.921.095	7.596.836	25.000	1.272	1.100.026
Italy	29.378.774		360.652	51.309.914	71.156.452	32.783.775	12.249.890	18.752.979	39.647.604	72.518.939	18.752.979	40.649.595	73.676.345	86.406.695	25.525.831	11.602.934	29.049.152	38.796.750
Luxembourg	66.789			82.466	1.354.336	824.859	1.360.996	10.701	2.547.132	138.147	10.701	3.222.768	147.728	443.381	384.220	3.614.277	12.060	3.393.366
Netherlands	9.242.052		6.081.198	10.942.781	7.314.911	2.932.896	27.187.865	372.816	33.883.739	13.595.392	265.636	45.730.336	13.837.809	7.493.695	3.956.287	37.524.732	593.053	48.030.514
Norway	101.721.425		5.439.143	106.813.424	62.763.437	141.149.560	85.299.151	2.652.319	31.436.215	136.112.467	2.630.010	35.585.805	138.459.470	88.986.419	161.872.336	77.671.297	2.614.991	32.670.060
Portugal																		
Sweden	16.304.628		1.389.177	21.050.675	16.316.772	12.440.273	30.503.709	367.246	32.922.002	24.282.826	301.463	37.275.568	31.384.598	3.949.433	29.304.056	28.965.584	611.236	29.924.796
Slovenia																		
UK																		
TOTAL	295.920.300	0	25.409.940	418.582.208	304.721.463	289.036.484	282.474.633	39.323.474	432.846.100	537.225.566	36.330.359	390.627.736	492.912.012	323.725.535	350.019.891	347.567.781	51.932.169	387.484.342

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 Excel 2010 format, containing the detailed data since records began, summarised by year and by month; and also analysing certificate

activity by fuel source grouping per country, and giving details of the number of GOs that have been cancelled for use in other countries (“Ex-Domain Cancellations”), along with their source and destination.

Issuing, Trade & Redemption for All Countries																			
		Total : 2001 to 2017										Total : 2015 to 2017							
		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	160.931.903	3.788.708	98.271.464	105.182.767	102.055.752	39.338.946	63.646.946	4.949.787	145.156.890	89.267.315	2.189.537	67.740.763	91.511.944	60.589.769	14.832.485	23.261.080	3.141.553	77.098.722
	Wind - offshore	16.839.778	857.337	20.624.408	11.788.525	14.031.746	12.525.051	25.145.937	918.757	26.203.491	11.122.396	253.089	14.602.977	11.068.101	10.283.652	10.670.390	19.231.525	339.378	18.322.041
	Wind - unknown	132.133.584	13.678.210	74.213.016	135.110.791	87.282.424	126.437.817	91.791.693	10.477.731	78.770.550	79.228.264	7.350.632	44.689.459	83.995.857	62.891.301	84.404.803	67.339.088	4.791.990	57.595.747
		309.905.265	18.324.255	193.108.888	252.082.083	203.369.922	178.301.814	180.584.576	16.346.275	250.130.931	179.617.975	9.793.258	127.033.199	186.575.902	133.764.722	109.907.678	109.831.693	8.272.921	153.016.510
Hydro/marine		2.539.123.985	132.910.190	1.233.999.956	1.774.008.100	1.319.427.089	1.920.302.819	1.935.797.309	192.988.886	2.259.062.434	826.369.629	22.189.564	466.896.334	886.193.566	616.492.299	717.725.770	720.121.999	42.507.306	864.841.794
Other	Unspecified mechanical/other	23.126	41.731	191.959	69.580	99.379	26.698	5.975.630	1.561	5.973.646	11.294		14.910	57.968	85.300	18.498	81.234	835	157.213
	Unspecified renewable energy	9.143.620	1.498.336	4.446.457	7.653.036	3.755.354	4.733.640	12.361.113	2.177.580	4.859.218	7.087.713	377.382	2.796.710	5.147.678	2.753.334	3.736.630	3.844.530	1.437.733	3.919.842
	Unspecified heat	7.901		3.151	1.167		1.167	88		88	7.901		3.151	1.167		1.167	88		88
	Solar	38.694.610	4.936.703	26.802.273	39.966.169	50.962.915	30.859.961	29.647.396	15.177.392	28.370.298	35.452.268	3.700.204	25.136.528	36.625.243	49.737.394	30.526.353	29.317.100	12.500.274	26.996.326
	Geothermal	29.440.170	377.125	14.339.313	24.090.173	15.906.014	26.687.699	26.137.738	395.059	27.886.313	11.197.599	124.243	6.418.884	13.943.555	9.780.155	16.718.990	16.272.190	342.299	14.501.916
		77.309.427	6.853.895	45.783.153	71.780.125	70.723.662	62.309.165	74.121.965	17.751.592	67.089.563	53.756.775	4.201.829	34.370.183	55.775.611	62.356.183	51.001.638	49.515.142	14.281.141	45.575.385
	Solid - agricultural biomass (inc. energy crops)	13.945.295	452.567	10.164.343	11.641.001	3.623.482	10.517.061	12.195.123	503.361	11.836.357	6.804.741	158.328	5.386.251	7.127.204	2.299.438	6.636.871	7.988.794	218.544	6.557.172
	Solid - agricultural products	1.380.435	114.192	817.490	1.130.699	344.117	1.019.393	929.021	103.386	794.995	740.626	33.733	392.218	788.406	205.378	849.935	740.895	56.212	551.710
	Solid - renewable fuels (inc. For&Ag bp & w)	68.297.171	4.288.956	14.770.686	25.394.324	40.848.917	25.901.250	22.810.998	5.185.538	58.013.132	12.638.892	1.663.122	6.353.692	15.519.435	13.265.321	6.745.553	4.575.100	2.917.616	9.616.309
	Solid - forestry products	11.523.826	418.904	8.769.367	10.177.636	7.301.796	4.976.256	4.286.495	657.673	10.651.987	4.965.686	122.365	2.955.548	6.349.761	2.193.708	1.960.023	1.641.154	431.140	4.854.064
	Solid - forestry by-products & waste	15.705.897	714.840	7.819.278	10.759.129	6.481.237	5.035.442	4.777.864	1.018.720	10.818.125	6.005.929	87.301	3.976.357	6.410.690	2.425.282	2.320.114	2.333.045	396.148	5.675.758
	Gas - landfill	4.609.834	134.098	1.261.931	1.324.483	3.137.267	336.261	421.982	180.400	3.488.311	511.753	33.050	391.228	570.984	455.329	98.209	96.793	80.377	624.158
	Gas - sewage	608.928	45.189	138.056	569.913	12.748	24.760	25.020	257.376	169.108	350.160	9.473	92.028	363.041	8.430	20.420	20.680	16.560	118.142
	Gas - other biogas	23.932.553	8.004.522	8.130.528	20.609.748	13.137.854	9.814.005	8.269.140	14.715.851	10.547.909	15.996.287	7.112.302	3.871.817	16.793.011	9.374.717	8.405.818	6.913.800	13.691.513	5.159.164
	Solid - municipal biogenic waste	34.479.616	3.374.848	16.058.869	19.198.826	16.294.904	11.095.910	10.346.574	4.779.292	25.762.621	12.622.727	1.763.156	7.261.584	13.653.766	7.921.240	5.195.878	4.455.210	3.696.428	9.627.259
	Liquid - renewable fuels (inc. Mun.waste)	4.633.919	864.142	3.119.550	4.895.044	5.527.177	4.051.349	4.802.157	1.722.439	4.121.130	4.013.547	837.554	2.388.760	4.333.013	4.496.779	3.567.277	3.585.548	1.383.649	2.941.728
	Liquid - black liquor	15.092.649	121.201	10.840.885	15.159.495	2.404.670	3.961.181	2.977.830	115.161	11.599.897	8.410.501	16.140	4.932.239	9.420.652	1.062.867	2.579.590	2.233.289	16.369	7.126.997
	Solid - unspecified wood	8.168.908	410.522	6.304.803	9.107.963	2.606.413	4.440.061	4.274.294	362.428	6.827.144	4.715.530	209.525	3.098.509	6.145.956	1.442.973	3.337.319	3.197.943	221.897	4.733.145
Solid - industrial & commercial waste	33.938.042	7.308.260	9.484.657	24.369.864	20.944.121	6.601.493	6.137.851	14.719.866	19.439.681	15.880.328	6.634.760	3.903.404	17.429.208	9.121.255	4.055.910	3.611.649	13.769.754	5.563.817	
Biomass	236.317.073	26.252.241	97.680.443	154.338.125	122.664.704	87.774.423	82.254.350	44.321.491	174.070.397	93.656.707	18.680.809	45.003.635	104.905.127	54.272.717	45.772.917	41.393.900	36.896.207	63.149.423	
RENEWABLE		3.162.655.750	184.340.581	1.570.572.440	2.252.208.433	1.716.185.377	2.248.688.220	2.272.758.200	271.408.244	2.750.353.325	1.153.401.086	54.865.460	673.303.351	1.233.450.206	866.885.921	924.408.003	920.862.734	101.957.575	1.126.583.112
NUCLEAR		190.193.456	39.890.558	89.992.104	135.003.822		1.868.720	355.863	39.899.122	133.623.674	57.665.768	8.106.677	31.718.152	60.413.187		1.786.233	273.376	20.240.203	47.076.679
		3.521.500	224.651	96.544	3.159.156	497.631	3.358.512	233.434	155.554	83.366	2.106.912	72.121	5.905	2.151.708		2.224.506	200.004	154.834	1.884
	Solid - Unknown				3.447				3.447					3.447				3.447	
	Solid - Hard coal	2.238.884	1.989.226	1.298.582	2.238.884	1.380.582	249.582	1.339.582	1.989.226	1.298.582			609.000	1.397.144	940.582	249.582	899.582	1.989.226	858.582
	Solid - Brown coal	67			67														
	Solid - Peat	34.286	1.796	12.356	61.071	21.387	26.897	21.750	21.747	24.857	34.286	1.796	12.356	61.071	21.387	26.897	21.750	21.747	24.857
	Solid - Municipal solid waste	3.205.842	1.193.996	1.137.813	3.292.657	41.994	118.469	239.340	1.268.046	1.208.062	2.269.414	736.177	703.410	2.439.551	41.994	118.469	239.340	1.013.337	1.070.902
	Solid - Industrial and commercial waste	245.429	25.928	184.294	289.559	25.206	27.569	27.560	30.386	259.205	124.066	2.395	88.515	148.291	25.206	21.200	21.200	5.916	206.761
	Liquid - Unknown	7.354		6.913	7.154					6.913	441			5.301					5.060
	Liquid - Crude oil	11.074	10.656	418	11.074	418	418	418	10.656	418				5.541	418	418	418	10.656	418
	Liquid - Natural gas	261.476			64.013					164	244.573			64.013					164
	Liquid - Petroleum products	73.003	2.272	53.570	181.657	53.603			92.983	60.388	49.515	607	53.570	112.189	53.603			50.867	59.501
	Gaseous - Unknown	166.352			18.076		2		2.270	167	166.350								
	Gaseous - Natural gas	25.666.977	6.830.352	12.953.064	17.283.408	22.316.787	5.530.941	8.971.777	1.388.124	12.776.127	12.498.977	4.252.652	5.153.129	5.693.250	4.607.427	1.182.215	2.829.638	1.254.605	4.759.175
	Gaseous - Coal-derived gas																		
	Gaseous - Petroleum products																		
	Gaseous - Municipal gas plant																		
	Gaseous - Process gas				</														

Issuing, Trade & Redemption for all countries																			
		2017								2016									
		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	25.851.593		3.147.012	44.745.586	33.873.792	7.018.474	7.413.724	2.212.191	49.250.510	53.031.651	2.017.747	50.795.606	36.393.063	20.394.630	4.780.352	9.815.603	288.851	15.406.608
	Wind - offshore	3.464.729		1.288.687	3.920.844	4.824.934	3.243.549	7.710.275	130.681	8.115.456	4.360.753	77.290	8.306.653	4.511.054	4.410.569	5.647.074	7.926.761	187.885	7.067.408
	Wind - unknown	21.503.648		3.423.799	27.649.123	18.476.655	30.305.803	25.191.574	1.031.691	18.977.155	30.942.971	908.303	20.690.221	30.157.958	26.144.331	32.090.330	24.326.621	1.547.260	18.184.823
		50.819.970		7.859.498	76.315.553	57.175.381	40.567.826	40.315.573	3.374.563	76.343.121	88.335.375	3.003.340	79.792.480	71.062.075	50.949.530	42.517.756	42.068.985	2.023.996	40.658.839
Hydro/marine		188.360.433		12.898.068	262.484.901	196.250.217	196.714.048	195.125.644	10.715.982	294.438.470	345.706.900	8.193.511	246.673.649	330.468.528	223.676.293	275.713.342	275.242.034	16.786.544	293.760.138
Other	Unspecified mechanical/other					68.948	4.940	78.264	835	125.962	1.410		4.982	2.086	6.068	4.277	323		572
	Unspecified renewable energy	874.228		1.724	1.638.161	1.068.669	1.639.078	1.576.904	272.321	1.347.239	2.133.020	82.492	1.314.544	1.438.166	900.868	1.053.621	1.148.622	209.954	1.234.843
	Unspecified heat							88		88	7.901		3.151	1.167		1.167			
	Solar	12.105.685		1.936.370	17.059.974	19.540.614	16.774.398	15.766.728	1.340.446	20.230.566	21.492.553	1.267.688	19.820.984	17.838.461	27.891.916	12.176.604	11.945.348	10.400.025	5.260.309
	Geothermal	905.470		173.160	2.379.945	2.467.510	4.404.442	4.661.642	43.181	3.612.812	5.154.490	28.511	3.940.860	5.305.229	4.023.473	5.518.019	5.289.769	88.404	5.601.168
		13.885.383		2.111.254	21.078.080	23.145.741	22.822.858	22.083.626	1.656.783	25.316.667	28.789.374	1.378.691	25.084.521	24.585.109	32.822.325	18.753.688	18.384.062	10.698.383	12.096.892
Solid - agricultural biomass (inc. energy crops)		2.167.733		141.500	2.668.115	1.446.789	4.738.027	5.211.051	144.389	1.753.485	2.627.971	125.509	2.557.683	2.382.023	691.469	1.479.478	1.736.788	36.238	1.694.618
Solid - agricultural products		232.510		57.306	272.058	150.832	634.331	530.928	12.498	156.129	278.684	30.607	118.110	262.276	6.376	99.017	93.380	5.824	137.364
Solid - renewable fuels (inc. For&Ag bp & w)		2.569.986		118.790	5.919.184	4.232.369	3.223.117	2.796.613	1.153.857	3.686.501	6.056.622	1.147.158	3.543.609	5.107.569	4.741.316	1.906.796	959.490	1.181.181	3.433.103
Solid - forestry products		919.342		159.469	1.907.825	1.119.599	544.700	399.301	27.578	1.593.782	2.299.269	23.734	1.554.590	2.033.429	168.593	589.535	528.046	140.464	1.455.576
Solid - forestry by-products & waste		1.521.156		342.029	2.096.477	913.656	1.119.708	950.688	100.811	1.949.940	2.504.810	56.186	1.866.209	2.310.011	1.074.648	798.709	925.936	120.648	1.719.366
Gas - landfill		66.959		14.313	82.292	94.847	25.714	40.196	12.604	180.376	194.843	7.799	172.540	242.462	187.500	51.679	34.968	36.224	204.691
Gas - sewage		81.397		2.676	100.561	2.731	11.088	1.196	5.650	49.688	143.029	4.527	44.663	142.888	597	9.331	19.483	4.686	46.784
Gas - other biogas		5.162.501		609.693	6.107.152	5.768.289	7.526.886	6.217.654	6.974.876	1.680.443	8.921.886	6.932.946	1.587.043	8.740.140	1.874.210	573.786	418.719	6.562.674	1.662.141
Solid - municipal biogenic waste		3.304.721		467.798	4.347.189	3.044.765	2.585.481	2.070.443	1.617.468	2.926.555	5.563.436	1.609.830	3.287.829	5.402.813	1.984.209	1.006.924	1.000.772	1.473.024	2.921.938
Liquid - renewable fuels (inc. Mun.waste)		1.025.606		124.395	1.813.593	1.811.641	1.704.387	1.597.066	730.348	1.478.660	2.290.043	730.439	1.546.491	1.811.208	1.351.433	1.135.335	1.257.591	507.227	850.923
Liquid - black liquor		1.997.979		627	3.360.087	419.007	235.054	235.054	13.696	2.549.391	3.546.780	13.696	2.799.558	2.768.478	439.130	1.794.553	1.448.252	2.444	2.463.130
Solid - unspecified wood		1.203.685		91.192	2.365.347	714.258	1.156.180	920.406	10.053	1.232.632	1.551.664	8.737	1.178.348	1.927.991	404.385	1.378.859	1.334.999	114.180	1.638.220
Solid - industrial & commercial waste		4.310.661		94.548	6.043.139	5.649.000	2.534.963	2.312.501	6.472.861	1.713.181	9.204.406	6.464.324	2.027.421	9.302.519	1.679.451	868.225	795.712	7.067.492	2.096.190
Biomass		24.564.236		2.224.336	37.083.019	25.367.783	26.039.636	23.283.097	17.276.689	20.950.763	45.183.443	17.155.492	22.284.094	42.433.807	14.603.317	11.692.227	10.554.136	17.252.306	20.324.044
RENEWABLE		277.630.022		25.093.156	396.961.553	301.939.122	286.144.368	280.807.940	33.024.017	417.049.021	508.015.092	29.731.034	373.834.744	468.549.519	322.051.465	348.677.013	346.249.217	46.761.229	366.839.913
NUCLEAR		15.366.710			16.661.743		1.594.050	81.193	4.862.094	12.129.271	20.233.542	4.544.053	12.825.902	20.924.948		85.904	85.904	4.447.573	18.986.272
Unknown		189.405			383.102		593.386	160.000	31.561	1.884	792.338	28.997	1.884	576.517		868.141	4	70.032	
Solid - Unknown									3.447					3.447					
Solid - Hard coal													209.000		691.000		650.000	47.714	609.000
Solid - Brown coal																			
Solid - Peat		3.375			8.955	2.439	7.871	7.871	16.392		25.793	1.796	7.238	36.791	12.641	15.363	10.216	5.355	18.550
Solid - Municipal solid waste		706.793			885.695	41.994	95.596	110.109	388.199	403.274	975.357	348.647	371.088	1.002.059		19.167		391.902	265.571
Solid - Industrial and commercial waste		41.142		6.401	67.070	25.206	21.200	21.200	408	133.383	53.262	408	53.386	57.876				2.654	30.043
Liquid - Unknown		441			241														
Liquid - Crude oil																			
Liquid - Natural gas											159.621			64.013					164
Liquid - Petroleum products					39.306	53.603			236	53.570	48.937	133	53.570	44.763				26.056	4.021
Gaseous - Unknown											166.350								
Gaseous - Natural gas		1.982.412		310.383	3.574.543	2.659.099	580.013	1.286.320	997.120	3.075.697	6.755.274	1.675.291	3.270.924	1.652.079	970.429	354.303	572.440	179.654	730.808
Gaseous - Coal-derived gas																			
Gaseous - Petroleum products																			
Gaseous - Municipal gas plant																			
Gaseous - Process gas																			
Heat - unknown																			
Heat - Process heat																			
FOSSIL		2.923.568		316.784	4.958.912	2.782.341	1.298.066	1.585.500	1.437.363	3.667.808	8.976.932	2.055.272	3.967.090	3.437.545	1.674.070	1.256.974	1.232.660	723.367	1.658.157
TOTAL		295.920.300	0	25.409.940	418.582.208	304.721.463	289.036.484	282.474.633	39.323.474	432.846.100	537.225.566	36.330.359	390.627.736	492.912.012	323.725.535	350.019.891	347.567.781	51.932.169	387.484.342



Forthcoming events

13–14	March	2018	Amsterdam, The Netherlands	RECs Market Meeting
23	March	2018	Brussels, Belgium	AIB General Meeting
16–17	April	2018	Dessau, Germany	<u>5th HKNR Conference on Guarantees of Origin</u> (at UBA in German language!)
8	June	2018	Edinburgh, Scotland	AIB General Meeting