Østfoldforskning

Report SUSTAINABLE INNOVATION

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Report no.:	OR 05.12
ISBN:	978- 82-7520-662-4
ISBN:	82-7520-662-6

Guarantees of Origin (GOs) for electricity

Legal regulations and application

Report no.: OR.05.12

ISBN no.: 978- 82-7520-662-4

ISBN no.: 82-7520-662-6

ISSN no.: 0803-6659

Report type: Commissioned report

Report title:

Guarantees of Origin (GOs) for electricity

Legal regulations and application

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Project number: 1477

Project title: Guarantees of Origin (GOs) for electricity

Commissioned by:

ECOHZ AS

Company contact:

Leif Hegna

Keywords:

- Guarantee of Origin (GO)
- Electricity
- Carbon footprint
- GHG emissions

Confidentiality:

Open

Number of pages:

19

Approved:
Date: June 14 2012

Project Manager
(Sign)

Research Manager
(Sign)

Contents

Summary

This report presents the legal regulations of Guarantees of Origin (GO) and Electricity Disclosure. In accordance with the EU Directives on Renewable Energy (2009/28/EC) and on the Electricity Market (2009/72/EC), national governments are currently implementing numerous regulations within the areas of Guarantee of Origin (GO) and Electricity Disclosure. Disclosing the fuel mix is a requirement which is placed upon suppliers by the Electricity Markets Directive. The standardised Guarantee of Origin (GO), as defined in the Renewable Energy Directive, is a tracking instrument which can be used for disclosure purposes. Electricity Disclosure as a requirement, was implemented for the first time in the Electricity Market Directive (2003/54/EC, Article 3(6)). This was, in 2009, replaced by a new directive (2009/72/EC, Article 3(9)). This directive requires that suppliers of electricity disclose their electricity portfolio with regard to energy source and environmental impact, specifying the emissions of CO_2 and the production of radioactive waste.

These measures and processes open up an opportunity for providing European consumers with more reliable information about the origin of their electricity supply and for electricity producers to create extra income from the generated electricity.

In Norway, the Norwegian Water Resources and Energy Directorate (NVE) is responsible for publishing the Electricity Disclosure for the Residual Mix. The system secures that all cancelled GOs are subtracted from the Disclosure, thus making the related environmental attributes “available” to the customers to be claimed. This system ensures that the environmental attributes related to the purchased GOs are not being double counted.

The report also gives a short presentation of how the most relevant standards and guidelines for environmental documentation allow GOs and similar products to be included in reports and inventories.

The main conclusions from the study are summarised as follows:

- The Norwegian Electricity Disclosure is annually published by The Norwegian Water Resources and Energy Directorate (NVE), thus ensuring that the attributes related to Norwegian GOs are not double counted.
- In June 2012 NVE implemented the pan-European harmonised methodology for Residual Mix calculations (RE-DISS) by publishing updated Norwegian Electricity Disclosures for 2010 and 2011. Thus, a complete Norwegian Electricity Disclosure regarding information about energy sources and CO_2 emissions is available for electricity suppliers and customers.
- According to the most relevant guidelines and standards for environmental documentation, specifically purchased energy products/instruments (e.g. GOs) seems to be allowed to be included and reported in the inventories, as long as the attributes are not double counted. However, there are ongoing discussions regarding specified eligibility criteria for the products/instruments to be claimed.

1 Introduction

In accordance with the EU Directives on Renewable Energy (2009/28/EC) and on the Electricity Market (2009/72/EC), national governments are currently implementing numerous regulations within the areas of Guarantee of Origin (GO) and Electricity Disclosure. Disclosing the fuel mix is a requirement which is placed upon suppliers by the Electricity Markets Directive. The standardised Guarantee of Origin (GO), as defined in the Renewable Energy Directive, is a tracking instrument which can be used for disclosure purposes. These measures and processes open up an opportunity for providing European consumers with more reliable information about the origin of their electricity supply and for electricity producers to create extra income from the generated electricity.

2 Guarantees of Origin (GOs) and Electricity Disclosure

A Guarantee of Origin (GO) is a means of proving the origin of electricity. The term was originally introduced in the old Renewable Energy Directive (2001/77/EC), and further adopted by the revised Renewable Energy Directive (2009/28/EC) with a reference to Electricity Disclosure: GOs shall provide proof to a final customer that a given share or quantity of energy was produced from renewable sources as required by Article 3(6) of Directive 2003/54/EC (repealed by Directive 2009/72/EC, The Electricity Market Directive). The Renewable Energy Directive also specifies that Member States may introduce criteria for the use of GOs in compliance with the Electricity Market Directive. Further, the Renewable Energy Directive specifies that one GO must be of a standard size of 1 MWh and requires that it must specify the energy source from which the energy was produced, its location and the start and end dates of production. The Directive also requires that Member States secure appropriate mechanisms to ensure that GOs are issued, transferred and cancelled electronically and are accurate, reliable and fraud-resistant.

Work on developing a European Standard for GOs began in 2009 with the objective to create a standardised GO, in line with relevant Directives and existing voluntary schemes, which can be used for mainly disclosure/labelling and trading. The work is planned to be finalised in July 2013 (della Faille de Leverghem 2012).

Electricity Disclosure as a requirement, was implemented for the first time in the Electricity Market Directive (2003/54/EC, Article 3(6)). This was, in 2009, replaced by a new directive (2009/72/EC, Article 3(9)). This directive requires that suppliers of electricity disclose their electricity portfolio with regard to energy source and environmental impact, specifying the emissions of CO_2 and the production of radioactive waste. The disclosed indicators are known as generated attributes and supply environmental information associated with the electricity generation processes. The aim of Electricity Disclosure is to provide consumers with relevant information about power generation and to allow informed consumer choice, in order that the selection of a supplier should not be based on electricity prices alone (RE-DISS 2010). The regulatory authority has to ensure that the information provided by suppliers to their customers is reliable and is provided, at a national level, in a form which easily enables comparison.

Suppliers of electricity can use GOs to account for the correct amount of electricity in order to achieve a satisfactory disclosure of the electricity mix. Thus an electricity supplier can disclose the relevant attributes of the GOs purchased by the consumer. For a customer who buys electricity as a commodity, without any special requirements, the disclosed electricity will represent a mix of electricity generated from different energy sources which are not covered by GOs. This electricity mix is known as the Residual Mix[1] and represents the consumption mix for all customers who do not purchase GOs in the related country/region. When calculating the Residual Mix it is necessary to take into consideration the trading of GOs, as well as national and international statistics for electricity generation, adjusted in accordance with import and export figures. The related attributes for the amount of electricity that have been traded explicitly (by GOs) have to be excluded from the calculation of the Residual Mix in order to avoid double counting. Double counting is defined as a

[1] Definition of Residual Mix (RE-DISS 2010): A set of attributes for purposes of implicit tracking in electricity disclosure, based on the attributes of all electricity generation in a domain/country, corrected for exports and imports of attributes of GOs etc. The objective of the introduction of the Residual Mix is to avoid double counting.

situation where attributes from the same instance of generated electricity are claimed more than once (Timpe et al. 2007)[2]. The principle for the system is illustrated in Figure 1.

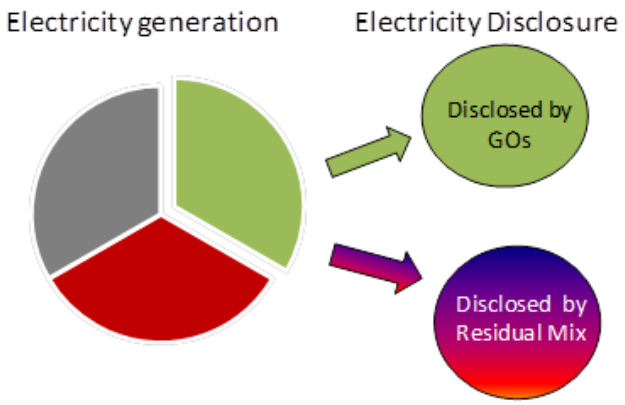

Figure 1: Principle for the Electricity Disclosure system.

As seen from the figure, GOs can be voluntarily purchased by any customer with the aim to claim the related attributes (origin, emissions etc.) of the generated electricity, thus improving the Electricity Disclosure. The remaining electricity customers have to use the Residual Mix for disclosure.

The European Energy Certification System (EECS) is a harmonised system for international trade of renewable energy certificates, such as GOs. EECS has been developed by the Association of Issuing Bodies (AIB), which is the leading enabler of international energy certificate schemes. Currently 17 European countries (including 3 Belgian regions) are registered in the EECS (AIB 2012a). The life cycle of a GO, according to the EECS system, is issuance, transfer and cancellation (AIB 2011). In order to maintain an open and steady market, the Issuing Body in any domain has a duty to publish activity reports on the number of GOs which have been issued, transferred and cancelled. The EECS market has increased significantly since its early start in 2000. This is illustrated in Figure 2.

[2] If a GO purchased by customers (who rightly can claim the corresponding attributes) also is accounted for in the Residual Mix, the attributes related to this GO is double counted (claimed both by the customer purchasing it specifically and by the “ordinary” customers who relates to the Residual Mix). It is therefore important that countries coordinate their treatment of such flows in the calculation of national or regional Residual Mixes for Electricity Disclosure.

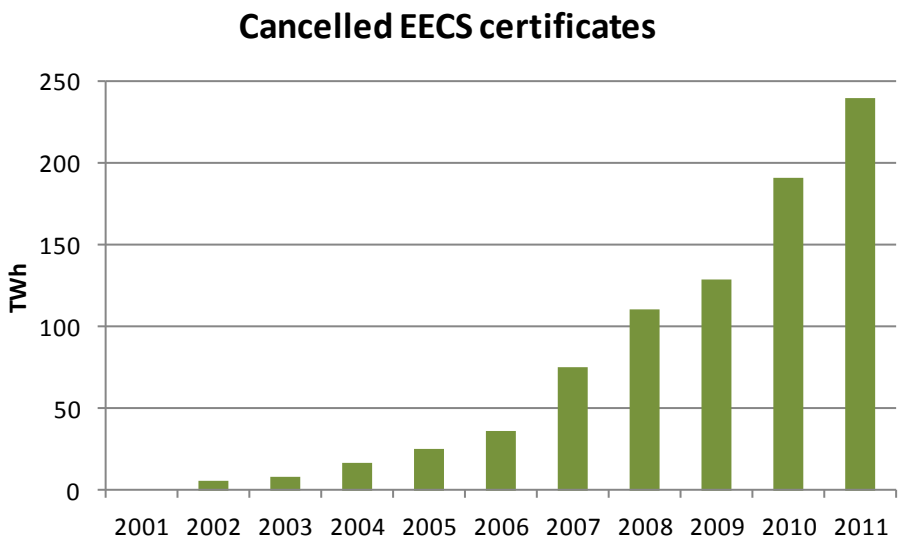

Figure 2: Cancelled GOs (and similar certificates) through the EECS system (AIB 2012b).

Norway is the major issuing country accounting for 61% (about 114 TWh) of the total issued volume in 2011 (AIB 2012b).

However, an analysis of the implementation of Electricity Disclosure and GOs in 29 European countries (Draeck et al. 2009) showes that Disclosure Systems were still not being implemented in accordance with harmonised standards in these countries. This is in line with Raadal et al. (2009) who conclude that there is a need for implementation of a fully coordinated, harmonised, and reliable system for the accounting of Residual Mixes in European countries. This would secure avoidance of double counting and create reliable systems for the European electricity market.

3 The Norwegian Electricity Disclosure of the Residual Mix

In Norway, the Norwegian Water Resources and Energy Directorate (NVE) is responsible for publishing the Electricity Disclosure for the Residual Mix. The legal authority for Electricity Disclosure in Norway is Forskrift om kraftomsetning og nettjeneste (The regulation for power sale and web services) (NVE 2012a), which is founded on the Norwegian Energy law (The Ministry of Petroleum and Energy 2010).

The calculation of the Norwegian Electricity Disclosure of the Residual Mix is based on a national approach and has been published by NVE for each of the years 2007 to 2011 (NVE 2012b), see Figure 3.

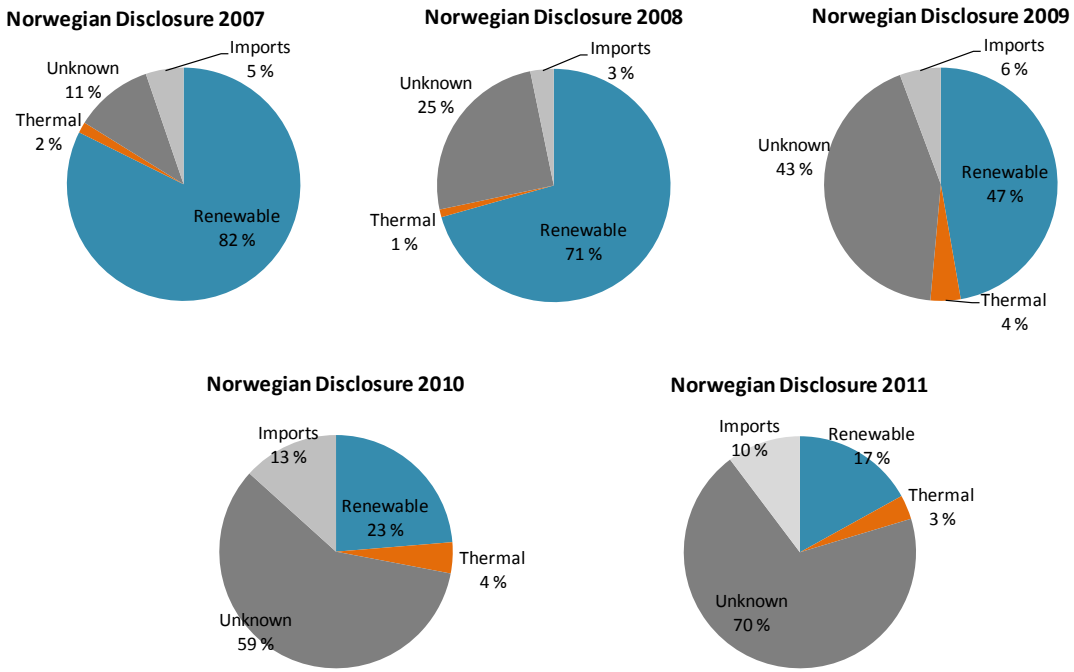

Figure 3: The Norwegian Electricity Disclosure 2007 – 2011, calculated by NVE (NVE 2012b). According to NVE, the CO_2-emissions related to the "unknown share" is suggested to account for 374,6 g CO_2/kWh (based on average European power generation, EU-27 2008)

As seen in the figure, the "Unknown" share accounts for 11%, 25%, 43%, 59% and 70% of the total Disclosures for the years 2007 to 2011, respectively. This "Unknown" share represents a deficit of attribute information related to the Norwegian Residual Mix which occurs because of the large volume of GOs being exported from Norway to countries in Europe. Thus, a deficit of attribute information related to the Norwegian Residual Mix occurs, as the volume of attributes available for the Residual Mix is lesser than the final consumption of electricity. The 70% "Unknown share" of the Disclosure 2011 corresponds to the net export of GOs (~90 TWh), corrected for physical export of electricity (~14 TWh). This clearly shows that trading of GOs has increased substantially in recent years and plays an important role in the calculation of the Residual Mix

However, the 11th of June 2012, NVE published (NVE 2012b), for the first time, the Norwegian Electricity Disclosure based on the pan-European harmonised methodology for Residual Mix calculations developed by the E-TRACK project (see section 3.1 below). In accordance with this, the Norwegian Electricity Disclosures for 2010 and 2011 are presented in Figure 4.

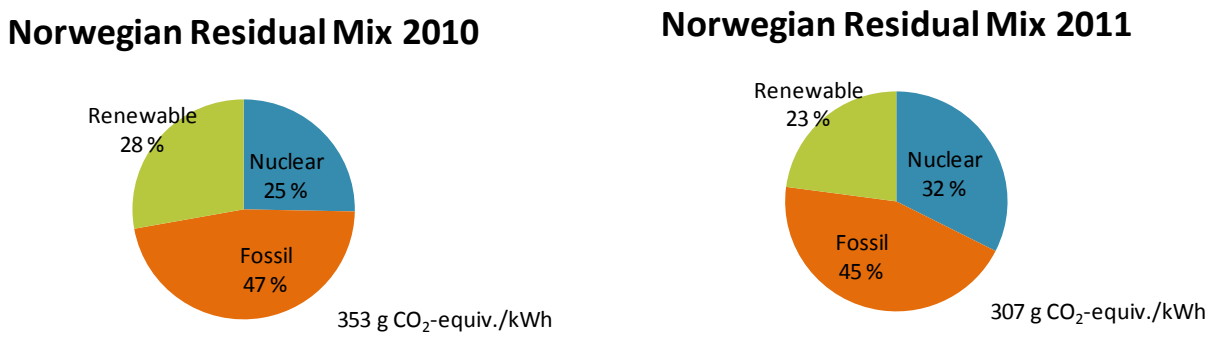

Figure 4: The Norwegian Electricity Disclosures 2010 and 2011 published by NVE and calculated on the basis of the European harmonised E-TRACK methodology (corrected for Norwegian regulations).

This means that a complete Electricity Disclosure for the Residual Mix regarding information about energy sources and CO_2 emissions is being available for electricity suppliers and customers and double counting of attributes related to GOs is avoided.

The Residual Mix for 2011 represents 87% of the electricity consumption in Norway as the remaining 13% is covered by GOs.

3.1 Harmonised methodology for Residual Mix calculations

The EU financed E-TRACK project (E-TRACK 2010) aimed to provide detailed insight into the tracking of electricity in order to set a European-wide standard for such tracking systems. The Reliable Disclosure Systems for Europe (RE-DISS) project was launched in mid April 2010 as a follow-up to the E-TRACK project (RE-DISS 2010). This project has been funded by the Intelligent Energy Europe Programme of the European Commission. It aims at improving significantly the reliability and accuracy of the information given to consumers of electricity in Europe regarding the origin of the electricity they are consuming. The background of the project is formed by the formal tools of the Guarantees of Origin for electricity from renewable sources and from high-efficient cogeneration, which are defined by European Directives. The project aims at supporting European countries to properly implement the requirements set out in the relevant Directives. In the long-term, the project aims to (RE-DISS 2010):

- Reduce significantly the double counting of energy issued with GOs across Europe;
- Increase the accuracy and reliability of disclosure information provided to European consumers;
- Give additional green electricity production in Europe a true market value

The RE-DISS project is scheduled to terminate in October 2012. However, the results, methodology and calculations from the RE-DISS project are supposed to be followed up by EPED: a platform for competent bodies that are establishing a European standard for Electricity Disclosure (EPED 2010). EPED and RE-DISS are therefore working closely together.

Based on the methodology recommended by the E-TRACK project, the EPED platform and RE-DISS project have calculated national Residual Mixes for 27 European countries for 2009 and 2010 (Jakobsson 2010) and (Klimscheffskij 2011). By applying the results from the above described Residual Mix calculations for Norway, the incomplete Norwegian Disclosures (with "Unknown" shares) presented in Figure 3 can be replaced by more complete Disclosures showing energy sources and related CO_2-emissions. These are presented in Figure 5. It should be noted, however, that information about the production of radioactive waste related to the generation of electricity is still missing.

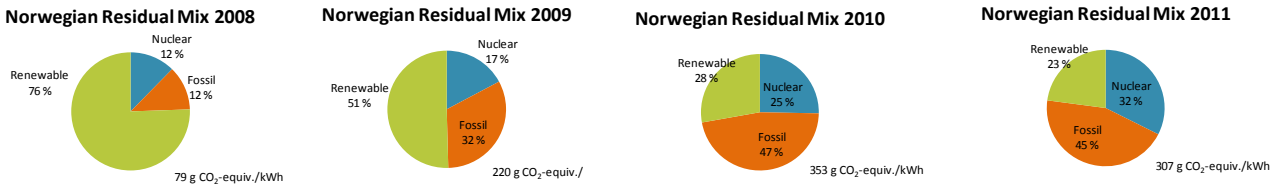

Figure 5: The Norwegian Electricity Disclosure 2008 – 2010, calculated on the basis of a European harmonised E-TRACK methodology[3].

The Residual Mix for 2011 refers to NVE's publication of the 11th of June 2012 (NVE 2012b), which has been based on the E-TRACK/RE-DISS methodology (see Figure 4 above).

However, it should be mentioned that NVE's version differs to some extent from the calculations within the RE-DISS project. The main reasons for this are some differences between the Norwegian regulations and the RE-DISS methodology. In Norway, the issued GOs must be cancelled within the 28th of February the coming calendar year (while the deadline within the RE-DISS project is the 31st of March). Further, in Norway GOs have to be issued and cancelled within the same calendar year (while, within the RE-DISS project, issued GOs which have not been cancelled within the 31st of March the coming calendar year will be transferred to the next calendar year).

As seen in the figure, the increasing volume of exporting GOs affects the Norwegian Electricity Disclosure in the direction of containing less and less renewable energy sources. This is logic, as the export of GOs leads to a need for import of the European Attribute Mix (EAM) to compensate for the national attribute deficit (or "Unknown" share, according to Figure 3). As long as the European Attribute Mix mainly consist of fossil energy sources, the "exchange" between exported GOs and the EAM will, of course, reduce the renewable share of the Disclosure, thus making it more "dirty".

[3] The energy sources and related CO2-emissions for the Residual Mix 2008 been calculated by Ostfold Research, based on information about the composition of the European Attribute Mix.

3.2 Avoiding double counting of attributes

As long as the Norwegian Water Resources and Energy Directorate (NVE) annually calculates and publishes the Norwegian Electricity Disclosure (NVE 2012b), the attributes related to Norwegian GOs are excluded, thus not double counted. The system secures that all cancelled GOs (whether cancelled in Norway or in another European country) are subtracted from the Disclosure, thus making the related attributes “available” to the customers to be claimed. This means that Norwegian customers, who do not purchase GOs, have to be referred to NVE’s Disclosure and the related attributes.

As long as both physical electricity and GOs are being exchanged cross border, a harmonised system should be established to balance those imports and exports, thus creating reliable and complete national Disclosures and secure avoidance of double counting of attributes. When applying the pan-European harmonised methodology for Residual Mix calculations in all the European countries, which is developed through E-TRACK and further implemented through RE-DISS, double counting of attributes related to the purchased GOs is avoided. In addition, all countries will attain Residual Mixes containing the complete picture regarding energy sources. In accordance with this, NVE implemented this RE-DISS Residual Mix methodology for Norway by publishing the updated Norwegian Electricity Disclosures for 2010 and 2011 (NVE 2012b). Thus, a complete Norwegian Electricity Disclosure regarding information about energy sources and CO_2 emissions is being available for electricity suppliers and customers.

4 Relevant international standards and guidelines for environmental documentation

Documenting environmental performance, by the use of the environmental indicator Greenhouse gas (GHG) emissions, can be done by applying different scopes related to the value chain of the product/corporate under study (GHG Protocol 2012b). The scopes relate to direct and indirect GHG emissions, where direct GHG emissions are emissions from sources that are owned or controlled by the reporting entity and indirect GHG emissions are emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity.

According to the GHG Protocol those direct and indirect emissions are categorised into the following three broad scopes:

Scope 1:	All direct GHG emissions
Scope 2:	Indirect GHG emissions from consumption of purchased electricity heat or steam.
Scope 3:	Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&D losses) not covered in Scope 2, outsourced activities, waste disposal, etc.

Since electricity represents an energy carrier, the consumption of electricity does not lead to any emissions when looking at the consumption stage as a separate stage of the life cycle of electricity generation. However, the production stage of the electricity value chain leads to GHG emissions, and the amount of the emissions is strongly dependent on the energy source, as well as the technology used for the electricity generation. In addition, the extraction of fuels (e.g. coal and gas) also leads to emissions and environmental burdens. Hence, the different scopes include different life cycle stages of the electricity value chain. As Scope 1 only includes direct emissions, the emissions from the consumption of purchased electricity will always be zero, independent of the energy source used for the electricity production. Scope 2 includes the electricity production stage, thus including the direct emissions related to the electricity production of the purchased electricity. Further, Scope 3 includes the entire value chain for electricity generation, which means that extraction of fuels, infrastructure related to the building of dams, power plants etc., as well as end of life of the plants shall be included.

Currently, several different standards and guidelines for environmental documentation of companies and products/services exist. The most relevant standards according to their application of the different scopes and the purchase of GOs are presented in the following.

4.1 GHG accounting for companies and organisations

With regard to corporate GHG accounting, there are two relevant GHG Protocol standards. A short description of these standards is given below.

The GHG Protocol Corporate Accounting and Reporting Standard
The GHG Protocol Corporate Accounting and Reporting Standard (World Resources Institute (WRI) & World Business council for Sustainable Development (WBCSD) 2004) serves as the basis for most public GHG reporting programs and a guide for many corporations that develop internal GHG inventories (Bird & Sumner 2011). It covers the accounting and reporting of the six greenhouse gases covered by the Kyoto Protocol (carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF6)) and was designed to help companies prepare a GHG inventory that represents a true and fair account of their emissions, through the use of standardized approaches and principles. This standard applies scope 2, which means that the electricity consumption data shall represent direct GHG emissions from the power generation process. This means that renewable power is usually accounted for as zero GHG emission. According to this standard, ”Scope 2 GHG emissions will primarily be calculated from metered electricity consumption and supplier-specific, local grid, or other published emission factors” (World Resources Institute (WRI) & World Business council for Sustainable Development (WBCSD) 2004).

The GHG Protocol started, in December 2010, a process to develop GHG Power Accounting Guideline, primarily designed to assist organisations in preparing inventories and mitigation strategies for corporate reporting practices for scope 2. The final publication of the guidelines is scheduled for summer 2012. The background for this work has mainly been the many existing opportunities, provided by energy markets around the world, to purchase the rights and benefits of renewable energy independent of commodity electricity (GHG Protocol 2010).

A draft document was presented in February 2012 (GHG Protocol 2012a), provided by the GHG Protocol to stakeholders around the world. The draft has been followed up by several webinars (February/March 2012) where stakeholders have been invited. According to the draft, “the GHG Protocol has recognised that its existing recommendations to only use grid average emission factors can limit a company’s ability to influence the composition of energy sources on the grid at large, and constrain the way end-user purchasing power and sustainability reporting can be leveraged towards the common goal of driving growth in renewable energy”. Energy purchasing mechanisms can provide a means of purchasing, tracking, and claiming the use of specific generation and its attributes, and to build awareness and demand for low-emitting energy products over time. The GHG Protocol recognises these instruments as an appropriate means of demonstrating action towards mitigating scope 2, provided they meet the specifications outlined in the Guidelines concerning accurate accounting and integrity of these market instruments. Further, the GHG Protocol will identify a few consensus-based eligibility criteria with the aim to strengthen the impact of these market instruments, of which companies and program designers are strongly advised to consider in their energy purchasing instruments. Ostfold Research has, among others, given their feedback to the Guidelines Draft (Raadal & Svanes 2012).

The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard
In October 2011, the *GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard* (World Resources Institute (WRI) & World Business council for Sustainable Development (WBCSD) 2011b) was published, enabling companies to assess their entire value chain emissions impact and identify the most effective ways to reduce emissions. Often, the majority of total corporate emissions come from scope 3 sources, which means many companies have been missing out on

significant opportunities for improvement. Users of this new standard can now account for emissions from 15 categories of scope 3 activities, both upstream and downstream of their operations. When using this standard, the electricity consumption data must represent the whole life cycle chain of the power generation process (LCA data). Hence, renewable power will always represent GHG emissions larger than zero. According to this standard (Table [7.4]) company-specific power purchased data is an example of primary data which can be used in the accounting.

4.2 GHG accounting of products and services

The most relevant standards and guidelines for GHG accounting of products and services are presented below.

ISO/DIS 14067 Carbon footprint of products
The International Organization for Standardization (ISO) is working on a new standard for Carbon footprint of products (ISO/DIS 14067 Carbon footprint of products, (ISO 2012)). The standard builds largely on the existing ISO standards for Life Cycle Assessments (ISO 14040/44) and environmental labels and declarations (ISO 14025) and is planned for final publication during 2012. In comparison to the existing LCA standards it contains further provisions for the uniform quantification of GHG emissions. The standard is currently a Draft International Standard (DIS), implying that the main provisions have been set and commenting is now taking place on a per country basis. The commenting and voting period ends on the 6th of June 2012. Since the standard has a life cycle perspective it requires electricity consumption data which represents the whole life cycle chain of the power generation process.

The ISO/DIS has the following text regarding treatment of electricity (Chapter 6.3.9.3): *"When a supplier of electricity can deliver a specific electricity product and guarantee that the electricity sale and the associated GHG emissions are not double counted, the data for that electricity shall be used for the product studied. When the supplier of electricity does not provide specific GHG data for the specific electricity product, the GHG emissions associated with the national grid where the life cycle stage occurs shall be used"*.

PAS 2050:2011
In UK, the *Publicly Available Specification (PAS) 2050:2011* (Department for Business Innovation & Skills (BSI) 2011) was published in September 2011 (as a revised version of the earlier PAS 2050). PAS specifies requirements for assessing the life cycle greenhouse gas emissions of goods and services based on key life cycle assessment techniques and principles. The standard has a life cycle perspective, thus the electricity consumption data has to cover the whole life cycle chain of the power generation process.

Regarding eligibility of renewable energy-specific emission factors, PAS says as follows (Chapter 7.9.4.1):
A renewable energy-specific emission factor shall be applied to a process using renewable energy only where both of the following can be demonstrated.

a) *The process used the energy (i.e. use of renewable energy generated onsite) or used an equivalent amount of energy of the same type to that generated (i.e. use of renewable energy*

delivered via an energy transmission network that combines different types of energy generation), and another process did not use the energy generated whilst claiming it as renewable.

b) *The generation of this renewable energy does not influence the emission factor of any other process or organization using the same type of energy (e.g. renewable electricity) and is excluded from the national average emission factor.*

Where conditions a) or b) are not met, national average energy emission factors shall be used.

The GHG Protocol Product Life Cycle Standard

The *GHG Protocol Product Life Cycle Standard* (World Resources Institute (WRI) & World Business council for Sustainable Development (WBCSD) 2011a) was published in October 2011 and enables companies to measure the greenhouse gas emissions of an individual product. Covering materials, manufacturing, use and disposal, this product standard will help companies improve and design new products, and provide insights for more informed consumer choices. This standard also relies on a life cycle perspective, which means that electricity consumption data has to cover the whole life cycle chain of the power generation process.

Regarding selecting electricity emission factors, this standard says the following (Box [8.3]):
"As with data from other emission sources, companies should select electricity emission factors that are geographically specific to the electricity sources used in the product inventory. When an electricity supplier can deliver a supplier-specific emission factor and these emissions are excluded from the regional emission factor, the supplier's electricity data should be used. Otherwise, companies should use a regional average emission factor for electricity to avoid double counting".

4.3 Summary standards and guidelines

After having examined the above five relevant standards/guidelines, it seems clear that specifically purchased energy products/instruments (e.g. GOs) seems to be allowed to be included and reported in the inventories, as long as the attributes are not double counted. However, there are ongoing discussions regarding which products that are allowed to be claimed. The current practise seems to vary among stakeholders and companies.

The main requirement for allowing such products/instruments is that the environmental attributes are not double counted. This requires reliable tracking instruments and systems that excludes specifically sold electricity from the related national/regional grid mixes. If such a system is broadly implemented, the customers who purchase specific electricity rightly can claim the related environmental attributes while the remaining customers have to claim the average remaining fuel mix, known as the Residual Mix. Through the implementation of the Best Practice recommendation provided by the RE-DISS project (RE-DISS 2010), such a system is available for Europe and is already implemented in several countries.

5 Conclusions

The main conclusions from this study are summarised as follows:

- The Norwegian Electricity Disclosure is annually published by The Norwegian Water Resources and Energy Directorate (NVE), thus ensuring that the attributes related to Norwegian GOs are not double counted.
- In June 2012 NVE implemented the pan-European harmonised methodology for Residual Mix calculations (RE-DISS) by publishing updated Norwegian Electricity Disclosures for 2010 and 2011. Thus, a complete Norwegian Electricity Disclosure regarding information about energy sources and CO_2 emissions is available for electricity suppliers and customers.
- According to the most relevant guidelines and standards for environmental documentation, specifically purchased energy products/instruments (e.g. GOs) seems to be allowed to be included and reported in the inventories, as long as the attributes are not double counted. However, there are ongoing discussions regarding specified eligibility criteria for the products/instruments to be claimed.

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