

Green Electricity Purchasing Instruments – Are We Heading for Carbon-Gate?

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Introduction

Green electricity purchasing instruments or tariffs generally involve the sale of environmental attributes associated with electricity generation, such as the attribute of coming from a renewable source. Consumers may buy such instruments because they want to increase the amount of renewable electricity generated, or, if they are measuring and reporting their greenhouse gas emissions, they may also want to report the emissions associated with their electricity consumption as zero.

However, some purchasing instruments may not deliver additional renewables, and counting emissions as zero can undermine the usefulness and credibility of greenhouse gas accounting. The potential problems with green electricity purchasing instruments include:

1. Purchasing such instruments may not necessarily increase the amount of renewable electricity produced (particularly where the amount of renewables is driven by government regulations);
2. Counting green instruments that do not increase the amount of renewables as having zero emissions can undermine the accuracy and relevance of greenhouse gas accounts; and
3. The low-carbon attributes associated with green electricity instruments may be double-counted in grid average emission factors.

There is sometimes a hint of creative accounting with green electricity instruments, e.g. making emissions seemingly disappear without reducing actual emissions. And there is also the spectre of reputational risk for reporting companies that play too loose with their greenhouse gas accounting practices.

The issue of how to account for green electricity purchasing instruments in greenhouse gas accounting is highly topical at the moment as the Carbon Disclosure Project (CDP) is expected to change its guidance to allow double-counted, non-additional green electricity to be reported as having zero emissions (for 2013 CDP submissions). The Greenhouse Gas Protocol is also currently developing guidance on green power accounting, and the outcome is likely to be adopted by most

other reporting initiatives.

In addition to the reputational risk to individual reporting companies, it is vitally important for the long-term credibility of greenhouse gas accounting, as a discipline, that its rules and practices are robust. This paper sets out the main problems with green electricity purchasing instruments, and also suggests some robust solutions.

What are green electricity purchasing instruments?

Green electricity purchasing instruments generally involve the sale of environmental attributes associated with electricity generation, such as the attribute of coming from a renewable source. Some instruments may be purchased together with electricity, and others may be purchased separately. The instruments can take a number of different forms, including:

1. **Tradable certificates** convey the environmental attributes associated with electricity generation, separately from the purchase of actual electricity.
2. **Supplier specific profiles or labels** convey the attributes associated with the electricity from a specific supplier (e.g. the proportion of supply that is from renewable sources).
3. **Contract specific profiles or labels** convey the attributes associated with a specific supply contract (e.g. the proportion of the supply that is from renewable sources).

To give an example, a consumer may purchase 1 MWh of electricity, and purchase 1 MWh's worth of tradable certificates (conveying the right to claim the attribute of being generated from a renewable source). The consumer may then claim that 100% of its electricity consumption is from renewable sources¹.

Why buy green electricity purchasing instruments?

There are two main reasons why consumers buy green electricity purchasing instruments:

1. To increase the amount of electricity from renewables (often in order to reduce greenhouse gas emissions).
2. To be able to claim zero emissions associated with electricity consumption in corporate greenhouse gas reports. Some companies report the emissions associated with their electricity consumption as zero if they have bought green electricity purchasing instruments.

Problems with green electricity purchasing instruments

There are a number of potential problems with green electricity purchasing instruments:

1. **No increase in renewable generation.** Often purchasing green electricity instruments does not

¹ It is not possible to track the specific electrons supplied via a transmission and distribution grid, so it is not possible to claim that the specific electrons received by a customer are from a renewable source, or have other environmental attributes. However, the intention of green electricity purchasing instruments is that they convey a right to claim the environmental attributes, independently of the actual electrons consumed.

increase the amount of renewable generation. In many countries the amount of renewables is determined by regulations and subsidies, or renewables are the lowest cost form of generation anyway (e.g. in countries with large hydro resources).

2. **Non-additionality undermines the credibility of greenhouse gas accounting.** If consumers of green instruments count their electricity emissions as zero, but the instruments do not increase the amount of renewable generation (and do not reduce greenhouse gas emissions), then the information in the greenhouse accounts becomes misleading. Such greenhouse gas accounts make it look like the consumer is reducing emissions, or has no impact through its electricity consumption, but in reality the consumer's electricity consumption does create greenhouse gas emissions.

For more discussion on how additionality² is essential for the accuracy and relevance of greenhouse gas accounting, please see Appendix I below.

3. **Grid double counting.** The low-carbon attributes associated with renewables are often already counted in grid-average emission factors. This means that if a consumer of a green electricity instrument claims the low-carbon attributes, those attributes are double-counted (once in the grid average emission factor, and once by the consumer).
4. **Geographical and temporal double counting.** Another form of double-counting arises if green instruments are purchased from different grid regions (e.g. different countries), or different time periods. It is very difficult to adjust the grid average of other geographical areas or time periods, and the result is that some "non-green" electricity is not accounted for by anyone.

For more discussion on geographical or temporal double-counting, please see Appendix II below.

Solutions to the problems with green electricity purchasing instruments

1. **Demand proof of additional renewable generation.** Consumers who genuinely want to increase the amount of renewable generation should ask for proof that their green instruments really do increase renewable generation. The onus is on suppliers that charge a premium for green instruments to demonstrate additionality.

A number of suggestions for stream-lined additionality tests are provided in Appendix III.

2. **Only count green instruments that create additional renewables as zero.** In order to maintain the credibility, relevance, and accuracy of greenhouse gas accounts only green electricity instruments that create additional renewable electricity should be counted as having zero emissions (subject to avoiding double-counting too – see below).

Note that the UK Government has adopted this solution since 2008, and international reporting guidance has yet to catch up. The Government Minister's explanation for this position is provided in Appendix IV.

3. **Grid double counting.** In order to avoid double counting, only low-carbon attributes that are

² The outcome from a decision or action can be described as being "additional" if the outcome would not have happened in the absence of the decision or action. Additionality means "would not have happened otherwise".

not already counted in the grid average should be counted by individual reporting entities. In order for this to happen, there should be a “residual grid-mix” factor that is adjusted to reflect the low-carbon attributes allocated by green electricity instruments.

4. **Geographical and temporal double-counting.** Green purchasing instruments should only be sourced from the same grid region and time period as the actual electricity consumption that the instrument is paired with. E.g. renewable energy certificates should not be purchased from Sweden to cover electricity consumption that occurs in the United Kingdom.

An alternative solution is to adjust the emission factors for the jurisdiction supplying the environmental attributes, or the time period that the attributes are from. However, this solution would require complex tracking mechanisms, and restatements for emission factors and results for past reporting periods.

Conclusions

There are a number of serious issues related to green electricity purchasing instruments, both in terms of creating real reductions in greenhouse gas emissions, and how such instruments are treated in greenhouse gas accounts.

For consumers who genuinely want to reduce emissions through the purchase of green electricity purchasing instruments, they should ask their suppliers for evidence that the premium charged does actually lead to additional renewable generation.

The Greenhouse Gas Protocol’s development of new guidance on green power accounting offers an important opportunity to introduce clear and robust accounting rules. We recommend that green electricity purchasing instruments should only allow reporting entities to claim zero emissions if the following conditions are met:

1. The green electricity purchasing instruments create additional renewable generation.
2. There is no double-counting of low-carbon attributes in grid average emission factors.
3. The green electricity purchasing instruments relate to electricity from the same grid region and time period as the electricity consumption the instruments are paired with.

Appendix I – Four Examples Showing the Importance of Additionality for Accurate and Relevant Scope 2 Accounting

This appendix provides four simple examples which illustrate why *additionality* is an essential condition if green purchasing instruments are to allow the consumer to count consumed electricity as having zero emissions. Additionality is essential if scope 2³ inventories are to fulfil the GHG Protocol principles of relevance and accuracy, and to ensure that the reported information is a “faithful, true, and fair account of a company’s GHG emissions”⁴.

Example 1. Accuracy

Widgets Ltd begins purchasing non-additional renewable electricity and reports it as zero emissions in its scope 2 inventory. Previously it had a contract for a mix of generation technologies, and reported the associated emissions. Because the contracted renewable electricity is not additional (i.e. it would have been generated regardless of the purchasing contract) there is no increase in the total amount of renewable electricity generated, and therefore there is no change in total GHG emissions either.

Widgets Ltd’s management and customers look at the company’s scope 2 emissions over time and see that emissions have reduced from the previous year to zero with the renewable contract. The management and customers believe that real emissions to the atmosphere have reduced, whereas real emissions to the atmosphere are exactly the same. Most stakeholders would feel that the information in the GHG reports is not accurate (i.e. it looks like there is a reduction in emissions, but there is not a reduction in emissions).

Example 2. Relevance

Widgets Ltd purchases non-additional renewable electricity and reports it as zero emissions in its scope 2 inventory. Because the emissions in the scope 2 inventory are zero the company does not think about undertaking any actions to reduce its electricity consumption, or to develop on-site renewables (as scope 2 emissions are already zero).

However, if Widgets Ltd did reduce its electricity consumption or develop on-site renewables this would have the effect of reducing actual emissions to the atmosphere, as total demand for grid electricity would be reduced (and grid generation would reduce correspondingly, including fossil-based generation).

In this case reporting non-additional renewable electricity as zero leads to poor decision-making (i.e. Widgets Ltd would genuinely like to reduce emissions but their GHG accounts don’t help them to make decisions which reduce emissions). The information in the inventory is not *relevant* for supporting good decision making.

Note: if Widgets Ltd purchased renewable electricity which was *additional* then reducing their electricity consumption or developing on-site renewables wouldn’t reduce emissions – and counting such electricity as zero *would* support good decision-making.

³ Scope 2 is the terminology used in the GHG Protocol’s Corporate Accounting and Reporting Standard to refer to emissions associated with the generation of purchased electricity, heat, and cooling.

⁴ P6 of the GHG Protocol’s Corporate Accounting and Reporting Standard.

Example 3. Relevance

Widgets Ltd purchases non-additional renewable electricity and reports it as zero emissions in its scope 2 inventory. In this example Widgets Ltd nevertheless undertakes measures to reduce its electricity consumption, however, because its scope 2 inventory is already zero the real reductions in emissions caused by reducing consumption are not reflected in Widgets Ltd's GHG accounts. The senior management question why the company is spending money on reducing consumption when it doesn't make any difference to *reported* emissions. The company then decides to abandon the energy efficiency programme as it doesn't appear to have any impact on emissions. Again the information in the inventory is not *relevant* for supporting good decision making.

Furthermore, Widgets Ltd would have liked to show its customers that its energy efficiency programme is reducing emissions – but its GHG accounts do not show this. They are not fit for the purpose of faithfully communicating the GHG emissions associated with the company's activities.

Example 4. Relevance and Accuracy

Widgets Ltd purchases non-additional renewable electricity and reports it as zero emissions in its scope 2 inventory. Widgets Ltd's main competitor Didgets Ltd decides not to purchase non-additional renewable electricity as it understands that doing so does not increase the total amount of renewable electricity that is generated (and therefore does not reduce actual total emissions). Instead Didgets Ltd decides to take the money it would have spent on the premium for non-additional renewable electricity and spend it on an energy efficiency programme which cuts its scope 2 emissions by 20%.

An environmentally conscious customer is deciding whether to use Widgets Ltd or Didgets Ltd, and looks at the two companies' GHG reports. The customer decides to choose Widgets Ltd as it appears to have zero scope 2 emissions, whereas Didgets Ltd has some scope 2 emissions. This is a bad decision as Didgets Ltd has done more to reduce real emissions than Widgets Ltd – the information in Widgets Ltd GHG accounts would not be considered accurate or relevant by the customer.

Appendix II – Geographical and Temporal Double-Counting

The environmental attributes of electricity can be purchased separately from the actual electricity itself, and this means that the environmental attributes might belong to electricity which is generated and consumed on a different transmission and distribution grid from the consumer purchasing the instrument. For example, it is possible that a company may consume electricity in the UK, but purchase renewable attributes associated with electricity generated and consumed in Sweden.

Similarly, the temporal period that the environmental attributes relate to may be different from the temporal period in which the actual electricity is consumed. For example, it is possible that a company consumes electricity in 2012, but purchases environmental attributes related to electricity which was generated and consumed in 2011.

The geographical or temporal disconnection between environmental attribute creation and reporting can create the following problems:

1. A form of double-counting occurs if jurisdictions which sell environmental attributes only calculate a residual grid mix, but do not also “import” the attributes of the jurisdiction to which the environmental attributes are sold.

Table 1. below illustrates the way in which emissions are unaccounted for if jurisdictions that export environmental attributes do not also import the residual attributes from the jurisdiction that purchases the environmental attributes.

	Country A	Country B
Total quantity of electricity generated	100 MWh	200 MWh
Generation technology	Coal	Wind
Total emissions from generation	100 tCO ₂ e	0 tCO ₂ e
Quantity of certificates A purchases from B	100 MWh	
Basic residual grid mix in country B (without “importing” residual attributes from country A)		0 tCO ₂ e
Scope 2 emission reported	0 tCO ₂ e	0 tCO ₂ e

In this example, all scope 2 emissions in both countries could be reported as zero, despite the fact that there were 100 tCO₂e associated with electricity generation.

A further issue is the practicality of tracking which jurisdiction eventually uses the traded environmental attributes (and therefore which attributes need to be transferred to the jurisdiction selling its attributes), as certificates may be traded multiple times before they are “used” by an end-user.

2. Similarly, a form of double-counting will occur if the environmental attributes for a time-period are subsequently used in a later time-period, but the greenhouse gas emissions for the earlier time-period have already been reported using a grid-average which has not been adjusted for

the subsequent allocation of environmental attributes.

There would be practical difficulties if all completed greenhouse gas accounts need to be restated using an updated emission factor based on the amount of renewable attributes which have been claimed in subsequent reporting periods.

Appendix III - Streamlined Tests for Additionality.

The following are some streamlined tests for additionality, with “additionality” defined as meaning *would not have happened otherwise*:

1. **Regulatory test.** Is the renewable electricity required by regulations, e.g. is there a regulatory mandate or obligation on suppliers to supply renewable electricity, and is the renewable electricity in question counted towards the mandate or obligation?

If the answer is “yes” the renewable electricity is unlikely to be additional.

2. **Financial test.** Is the renewable electricity supported financially through feed-in tariffs or other forms of subsidy?

If the answer is “yes” the renewable electricity is unlikely to be additional.

[A possible extra question could be: Is the level of financial support from feed-in tariffs or other forms of subsidy greater than the premium paid by the consumer for contracted or certified renewable electricity?]

3. **Common practice test.** Where there are no regulatory drivers or subsidies for renewable electricity, is renewable electricity generation the most common form of new electricity generation capacity anyway?

If the answer is “yes” the renewable electricity is unlikely to be additional.

4. **“Vintage” test.** Has the renewable electricity generation facility been operational for more than 15 years, and has the renewable electricity generation facility already paid back on the initial investment?

If the answer is “yes” the renewable electricity is unlikely to be additional.

If the answer to any of these checks is “yes” then the renewable electricity in question should not be considered additional and should not be counted as zero in a scope 2 inventory.

Appendix IV – UK Government Minister’s Explanation for Disallowing Non-additional Renewables to be Counted as Zero Emissions

Secretary of State for the Environment, Hilary Benn, 16 June 2008.

“I want to make sure that the green tariff market, which has grown rapidly over recent years, is clear for consumers and businesses about the precise benefit their tariff brings. Many energy suppliers offer green tariffs to businesses and domestic customers who want to make a contribution to environmental projects or help tackle climate change, but these differ in what they deliver.”

“It is increasingly difficult to demonstrate that buying a renewable electricity tariff is offering additional carbon emissions reductions compared with what suppliers are required to source to meet the Renewables Obligation. I have therefore decided that we will change the voluntary corporate reporting guidelines to bring them into line with current best practice and provide coherent carbon accounting. This will mean that for the reporting year 2008-9, best practice is expected to be for businesses to use a grid average rate - average rate of carbon emissions associated with electricity transmitted on the national grid - unless their supplier can prove the carbon benefits are additional.”