



Minutes of ICARB Energy Workshop

Monday 18th April 2011, Edinburgh University, Room L05, Old College, South Bridge,
Edinburgh, EH8 9YL
1pm – 4pm

Summary

The following document provides minutes from the ICARB energy workshop. The workshop discussed carbon accounting in the power sector in three broad areas: current guidelines and practices; software and data sources; and a potential standard framework and an accreditation system. The workshop was well attended by a cross section of stakeholders. It is agreed that future workshops should include more industry representatives from the power sector as well as carbon accounting software developers and even database creators in order to further improve ICARB's impact into carbon accounting practise in the power sector.

A framework and review process is critical to decision making. There are levels of carbon accounting appropriate to different stakeholders and this must be reflected in developed guidelines. ICARB should include other institutions/initiatives working in carbon accounting in the development of any guidelines.

A copy of the agenda and presentations are available on the ICARB website. (www.icarb.org)

Attendees

Andrew Kerr	Edinburgh Centre on Climate Change
Ben Murray	Blackwood Environmental Consulting
Camilla Thomson	University of Edinburgh
Daniel Hinze	Scottish Government
Diane Duncan	Highlands & Islands Enterprise
Gareth Harrison	University of Edinburgh
Graeme Cook	Scottish Parliament
Helena Lind	Heriot-Watt University
Iain Fraser	Environmental Perspectives LLP
Iain Hossack	North Ayrshire Council
Keith Baker	Glasgow Caledonian University
Neil Kitching	Scottish Enterprise
Robin Grenfell	SISTech @Heriot-Watt
Samuel Chapman	Heriot-Watt University
Shree Nisheeth	CMS
Susan Roaf	Heriot-Watt University
Susi Wiseman	Xodus Group
Vojtek Kojder	University of Edinburgh

Minutes

Welcome and Introductions - Chairs

Camilla Thomson welcomed everyone to the event and Samuel Chapman began with a brief introduction into ICARB – The initiative of Carbon Accounting. The website and its various uses were presented: carbon news is regularly updated; a number of carbon accounting tools in different sectors are discussed; and a wealth of other information surrounding carbon accounting is available.

Carbon Accounting in the Power Sector – Gareth Harrison

Gareth presented carbon accounting in the energy sector in relation to stakeholders and applications. There is a variety of stakeholders such as academics, energy suppliers and consumers. There is potential conflict between stakeholders. Also, there are a number of applications of carbon accounting. These include comparison in a number of forms; comparing to raw knowledge as well as between products or processes. Compliance represents the biggest application at present, with a tendency to look to how, not what it means. Justification for technologies is also a key application, although (self) justification is in some respects a misuse of the knowledge and can be affected by subjectivity.

As a result of the variety of stakeholders, carbon accounting means different things to different people. Disagreement should be acknowledged between these differences, since they lead to a great deal of confusion. These discussions need to be captured in order to move through the confusion. Methods also need to be better understood and discussed. The range of methods includes life cycle assessments to only operational assessments. There is also a need to rationalise boundaries in order to avoid double counting of associated emissions. Boundary allocation also needs to reflect the processes involved in a system. Datasets also exist in different forms, such as process-based data or cost-based data. The characteristics of these datasets must be understood. Data may also include a range of uncertainty; a typical characteristic that should be known. Different sources of data may also have different reliabilities as well as different scopes. Is the data representing only fuel consumption or other processes in the life cycle as well? Data and measures are complex and interweaving.

Discussion 1: Current Guidelines and Practices

Opening presentation

The discussion session was opened with a brief presentation from Camilla and Samuel. Samuel outlined some of the current guidelines, such as the ISO EN 14040/44 standard for Life Cycle Assessment of a product (or service). This is particularly favoured by engineers and the construction sector. Life Cycle Assessment (ISO-LCA) is standardised and understood, but still offers subjectivity. Legislation also dictates a number of other guidelines, such as the Power Sector's Fuel Mix Disclosure that accounts for associated emissions from use of fuels only. The UNFCCC also produce a guideline for whole countries that is fuel and process based. This highlights that different authorities may have different scopes and this should be understood. What is important is to map these differences and make links between guidelines if they exist. The Power Sector is unique in that its emissions intensity factors feed directly into the rest of the country. Defra emissions factors that represent these emissions intensity factors at present only include the fuel use associated with the life cycle of power generation. Is this appropriate? Will other life cycle processes be accounted for elsewhere? These issues need to be discussed and agreed upon.



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Summary of Discussions

The three fundamental purposes are suggested:

- decision support tools
- locating renewables and developing spatial boundaries
- creating clear matrices for the wider public

Each will offer their own variations on methodology for carbon accounting. There is a lack of guidance and variations in study approaches.

A comparison is drawn with GIS modelling in that one layer of carbon accounting may be used for decision making but other layers will offer greater detail. The communication of this should be outlined by ICARB.

Applications for carbon accounting of power generation include half-hourly measurements and relative carbon intensities for the grid in different regions of the UK. Indeed, North England and Scotland is lower than the rest of the UK. However, carbon accounting methodology should be able to communicate this in a more robust way in order to drive a reduction in total emissions.

Boundaries must be outlined for the power sector. It is important for an initiative such as ICARB to define what is negligible and what is not. A typical question that can be presented in this instance is whether shipping emissions can be ignored in a project. ICARB should offer such detail in guidance to help with these decisions with justification. Susi Wiseman suggests that in the Oil and Gas sector there are regulations that relate to such decisions for a project. This will be investigated by ICARB in order to transfer such knowledge to carbon accounting since ISO-LCA can miss emissions. It is noted that it can be difficult to obtain emissions factors for shipping but some companies do conduct straightforward calculations for their shipping emissions. Issues may arise for assigning emissions for contracted ships for freight transport for example. ICARB can help to define such issues specific to the power sector. Again, the oil and gas sector has procedures for this in transport sharing for offshore operations – days of emissions and use of ships are split between platform owners. There are important lessons to be taken from the O&G sector.

From the policy perspective, the Scottish Government seeks consumption-based reporting and carbon budgets. Decisions are made on financial budgets. The SG thinking for defining budgets is so that:

- MSPs can use a value they can trust
- Understand what the government is doing in relation to emissions reductions.

Input-Output analyses are done for total emissions in Scotland and their attribution throughout the budget. While adequate for budget emissions, top-down reporting as opposed to bottom-up take average data and do not help within sectors for understanding emissions profiles of these sectors. This prevents help from carbon accounting for budget line decisions.

It should be outlined the purpose of carbon accounting in the power sector. Decisions such as power plant A or power plant B require a different approach to simply attributing emissions to a given project. If LCAs are conducted for a great number of projects, there will inevitably be double counting. This aspect is important for meeting Scottish targets. There may also be political ramifications to consider – UK wide vs Scotland wide for instance.



A number of scales should be considered for guidance from ICARB. Large scale infrastructure projects, small-scale renewables and new/small-scale renewables to a development are but a few.

How much carbon a windfarm displaces is answered based on a set of emission factors chosen by the assessor who also decides upon the core baseline and the width of system boundaries. This situation has created difficulties in comparison from the academic literature. This has fed the same difficulties into the decision making process.

Power infrastructure is divisive both politically and publically. Therefore, the requirement for measurable accuracy and verification is critical. Fundamental to this is transparency in order to show due diligence in the accounting framework.

There was further discussion during this stage of the workshop including a large debate on demand-side impacts. This is not noted directly here, but will be considered in future Energy workshops. What is fundamental to ICARB is how demands and displacement parameters can be incorporated into carbon accounting methodologies. It is important to acknowledge the complex interplay of decision-making on emissions characteristics over a project's lifespan. It is suggested that financial accounting guidelines offer ways of characterising different decisions and uncertainties; ICARB and the sector should use prior knowledge on decision-making in the finance sector.

Discussion 2: Data, software and uncertainties

Opening Presentation

The discussion session was opened with a brief presentation from Camilla and Samuel. Camilla outlined a recent survey of LCA practitioners that shows the software used. Currently, there are a number of pieces of software available with Simapro by PRé Consultants being the most widely used, according to the study. Each piece of software has its own methodology and associated datasets. These also currently tend to have their own characteristics, with the selection of data having a large impact on results. Samuel discussed uncertainties in data, as well as variability that both individual datasets contain and also in having to use a number of datasets. These issues must be better defined both within the sector and also across carbon accounting methodology as a whole. Uncertainty throughout the accounting process must also be better defined. Uncertainty exists in the modelling, scenario and parameters set out in the methodology and ICARB sees these as areas where a framework would improve understanding dramatically, especially in sectoral contexts.

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Summary of Discussions

There is a clear division - as with previous discussions – that different stakeholders require different levels of detail with regards to LCAs and their results. Software packages at present are not aiding with transparency in carbon accounting which is key to advancing the practice. Academics have tended towards Excel while industry tends towards software due to relative durations of carbon accounting.

If emissions factors and methodology choices are visible, they allow revision and are open to criticism from peers. The peat emissions calculator for windfarms shows factors and is a good example of transparent methodologies and data sources at present (<http://www.scotland.gov.uk/Resource/Doc/229725/0062213.pdf>). It is accepted in discussion



that assessors may well choose different numbers but the importance lies with documenting the reasoning behind choices.

It is agreed that Bath University's Inventory for Carbon and Energy (ICE) (<http://www.bath.ac.uk/mech-eng/serf/embodied/>) is one of the most valuable pieces of work to date in collating emissions factors. It is fully referenced and transparent and is a good example of a starting point for improvements to standardised datasets.

Software developers should be included in future workshops where possible in order to drive change across the carbon accounting practise. This should also apply for those who develop datasets in order to better understand underlying assumptions.

Discussion 3: Standard Framework and Accreditation

Opening Presentation

The concept of a standardised framework is outlined briefly in order to open discussion as to whether this conceptually ideal end point for ICARB is feasible. With such frameworks in place for the power sector, it is conceived that accreditation for carbon accounts is the next logical step. This would provide decision makers with a way of having a greater degree of trust and certainty in emissions data.

It is proposed that the first step of this is to create a set of definitions for each sector that will then be tied together with other sectors. This definitions list (glossary) has been developed and requires vast input from practitioners both through workshops and the wider audience of ICARB (<http://icarb.org/carbon-accounting-glossary/>). A request from the chairs for input to this glossary is made.

Summary of Discussions

Currently, there appears to be a number of institutions that consider themselves definitive knowledge bases for carbon accounting. ICARB must be careful not to attempt to become yet another authority with its own idea of a standard carbon accounting methodology for each sector. Other institutions and initiative must be involved in ICARB's workshop process.

The power sector must be better represented in the ICARB energy workshops. This is seen as an important next step for developing tools for the given sectors.

Levels of carbon accounting should be defined in order to help at various layers of decision making. A "snapshot" of life cycle emissions is important for project conception for example. Verification of emissions may come later in a project's life cycle. However, care should be taken with this in order to ensure that snapshot studies are to an acceptable level of certainty. A screening process is also required in order to justify project decisions based on emissions. It is proposed that a database of studies should be created in order to supply secondary data for this top level decision layer.

The Oil and Gas sector uses empirical numbers when specific data is not available. This may offer a top level decision making tool. Industry can therefore help to improve knowledge on data gaps on a case by case basis. It is said that only the minimum time can be spent on this by industry. This may offer levels of data requirements based upon stages of projects. For instance, quick estimates of emissions can utilise empirical data and future assessments within the project can draw on more specific data.



An ICARB (or similar) framework should be a decision making tool at different levels. A better handle on the existing state of research would also be very useful in this regard.

Input/Output Analysis offers a good overall picture of economies at present, but does not offer lower level information and as such cannot provide the detail required for effective emissions reduction. It does, however, go further back into the supply chain for products and services (50% more embodies energy than LCA is suggested as a figure) and should be included for comparison. Imports are also included in this from other sectors where data for the supplying economy is available.

It is concluded that future workshops may be chaired by different groups of stakeholders in order to target different levels of decision making and application of carbon accounting. The current state of research must also be better known overall.

Date of next meeting

It is intended to host the 2nd Energy Workshop in September 2011. Registration and details will be posted on the ICARB website in due course.

