

Scoping Document for Carbon Footprint Management pilot project for Bord Iascaigh Mhara.

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1. Introduction

This scoping document has been commissioned from Carbon Tracking Ltd. by Bord lascaigh Mhara to clarify the best approach to be taken for introducing carbon footprint management to the Irish aquaculture industry. Carbon footprint management is equivalent to the more technical term Greenhouse Gas (GHG) emissions but the term "carbon footprint" has a more established place in public perception.

This document will first look at some of the different environmental standards that exist globally and nationally to ensure that any recommendations fit within the direction in which the global aquaculture industry is heading. It will then discuss existing projects to measure and publicise the carbon footprint of different food productions sectors. It will also look at the existing and future regulations concerning carbon footprint management for all industries including existing carbon footprint standards.

This document is to define the standards which will be used to conduct a pilot carbon footprint study of Kush Seafarms Ltd, Kenmare, Co. Kerry. The purpose of that pilot study is to:

- Identify difficulties encountered in the generation of accurate carbon footprint data for the different degrees of carbon footprint (see section 2).
- Set a benchmark for the rope-mussel industry.
- Highlight potential changes that will be required to apply carbon footprint methodology to other aquaculture sectors.
- Test market reaction to the use of carbon footprint data as a marketing tool.

In the BIM annual report of 2008¹, Jason Whooley stated that “Differentiating Irish seafood products will therefore be a key focus and BIM will be [driving] innovation and new product development to enable them to distinguish themselves from many of the low cost alternatives.” It is hoped that the improved credentials associated with additional carbon footprint information will help the Irish aquaculture industry to grow from a sales level of €131m in 2008.

This document will identify the standards which can be used to add a further differentiation to Irish seafood products, via carbon footprint management, and increase their share of a competitive global seafood market.

¹ BIM Annual Report, 2008 : <http://www.bim.ie/uploads/reports/BIM%20Annual%20Report%202008.pdf>

2. Carbon Footprint Explained.

The concept of a carbon footprint has been successfully used internationally to assess and represent the environmental impact of an activity, e.g. a product, a city, a country or even a lifestyle. A carbon footprint is a "measure of the impact a given activity can have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide".

The unit of measurement for the carbon footprint is "tCO₂e", i.e. tonnes of carbon-dioxide equivalent. This is the internationally accepted metric for carbon-footprint measurement and allows carbon-footprint of dissimilar activities to be added to give a single combined figure e.g. electricity usage, fuel usage, materials usage.

Different degrees of carbon footprint are possible under existing standards. The two main original standards are the Greenhouse Gas Protocol², dating from 2003, and the ISO 14064-1:2006 standard³, dating from 2006. Overall the 2 approaches are very similar in content and intent. There are no major or fundamental differences between the 2 standards. The ISO document is shorter, blunter and less descriptive. The GHGP is longer, more descriptive, and contains motivational reasons for GHG reporting, reflecting its aspirational character.

The recommendation from both standards on the minimum level of reporting covers direct fuel usage and all electricity/gas usage. This is referred to as "Scope 1 & 2" emissions according to the Greenhouse Gas Protocol and "Direct and Energy Indirect" emissions according to ISO 14064-1:2006.

Other indirect emission sources (e.g. the manufacture of materials used, the transport of a product to final point of sale) are considered optional under the Greenhouse Gas Protocol or ISO 14064-1 and referred to as "Scope 3" and "Other indirect" emissions respectively. The inclusion of some or all of these emissions brings a carbon footprint closer to a full lifecycle analysis (LCA) for emissions. These more detailed carbon footprints are discussed further in section 4.

² Greenhouse Gas Protocol : <http://www.ghgprotocol.org/>

³ ISO 14064-1:2006 : http://www.iso.org/iso/catalogue_detail?csnumber=38381

3. Existing Environmental Standards in Food Production.

Many global and national level organisations have already begun to touch on the subject of carbon footprint in existing sustainability and organic criteria. A number of those organisations will be reviewed, particularly those which have an existing policy on aquaculture.

3.1 Aquaculture Stewardship Council

The Aquaculture Stewardship Council⁴ (ASC) was founded in 2009 by the World Wildlife Fund⁵ (WWF) and the Dutch Sustainable Trade Initiative⁶ (IDH) to manage the global standards for responsible aquaculture. These standards are currently under development in a process co-ordinated by the WWF, known as the Aquaculture Dialogues.

This process has already produced standards for tilapia, pangasius, abalone and bivalves which can be accessed at via a WWF website⁷. Standards for freshwater trout, salmon, shrimp, Seriola and cobia will be finalized in early 2011 and the ASC expects to be in full operation by mid 2011.

The standard for bivalves⁸ includes a requirement for ongoing monitoring of energy use related to production. The stated rationale for this is the direct link between energy use and CO₂ emissions. No requirement is made for calculating a carbon footprint, either at an organisational or product level.

3.2 Global Aquaculture Alliance

The Global Aquaculture Alliance⁹ defines itself as "an international, non-profit trade association dedicated to advancing environmentally and socially responsible aquaculture". It currently offers a certification process⁹ for the production of tilapia, shrimp, channel catfish and pangasius. The existing certification processes make no mention of energy or emissions monitoring.

The GAA is studying the area of carbon footprint calculation and a presentation¹⁰ by one of their researchers, Dr. David Little (Univ. Stirling, Scotland) indicates that

⁴ Aquaculture Stewardship Council : <http://www.ascworldwide.org/>

⁵ WWF : <http://wwf.panda.org>

⁶ Dutch Sustainable Trade Initiative : <http://www.dutchsustainabletrade.com/en/home>

⁷ Existing ASC standards : <http://www.worldwildlife.org/what/globalmarkets/aquaculture/aquaculturedialogues.html>

⁸ ASC Bivalve standard : <http://www.worldwildlife.org/what/globalmarkets/aquaculture/WWFBinaryitem17872.pdf>

⁹ Global Aquaculture Alliance Certification Process : <http://www.gaalliance.org/certification/form.php>

¹⁰ Global Aquaculture Alliance position on carbon footprint : <http://www.gaalliance.org/update/GOAL10/Little.pdf>

they see difficulty with the existing large number of carbon footprint standards globally and would support a life-cycle analysis (LCA) of aquaculture production. No information is given as to the specific steps that are being taken by the GAA, if any, to define the process to perform the LCA of aquaculture production.

3.3 Soil Association, UK.

The Soil Association¹¹ is a UK organic certifier and has guidelines specifically for aquaculture¹². In its guidelines, no reference is made to energy of emissions management/monitoring. It does recommend the "use renewable energy sources and recycled materials where possible" but does not go beyond that.

The Soil has done extensive work on the carbon-related benefits of organic agriculture, mainly through sequestered soil carbon, but has not extended this work to aquaculture which is not its core area of expertise.

3.4 Friend of the Sea

Friend of the Sea¹³ is a non-governmental organisation (NGO), whose goal is to "conserve the marine habitat". They provide sustainability certification for both fished and aquaculture products. The organisation was marked favourably in a 2010 WWF report¹⁴ on eco-labelling.

As part of a broad set of sustainability criteria it requires the completion of a carbon footprint assessment within 12 months of certification. However no details of the standards required for this footprint assessment are given. One French shellfish producer, Mytilimer¹⁵, has been certified in March 2010. An Irish company, Irish Seaspray¹⁶, has been certified for its organic salmon in March 2009. Neither company indicates whether a carbon footprint has ever been carried out post-certification.

It also has specific energy management criteria which constant monitoring and setting of targets for energy usage. It also requires that a certified producer reduces its energy footprint by 20% each year or that 20% of the annual carbon footprint be offset by purchasing certified carbon offsets.

¹¹ Soil Association, UK : <http://www.sacert.org/Standards/tabid/1084/language/en-US/Default.aspx>

¹² Soil Association, Aquaculture : <http://www.soilassociation.org/LinkClick.aspx?fileticket=pM14JxQtcs4%3d&tabid=353>

¹³ Friend of the Sea : <http://www.friendofthesea.org/>

¹⁴ WWF, Report on eco-labelling : http://assets.panda.org/downloads/full_report_wwf_ecolabel_study_lowres.pdf

¹⁵ Mytilimer : http://friendsofthesea.elasticolab.com/news-doc.asp?ID=19&CAT_ID=1

¹⁶ Irish Seaspray : <http://www.irishseaspray.com/>

3.5 Irish Quality Standards

Bord Iascaigh Mhara has existing quality standards for mussels, oysters, salmon and trout¹⁷. The use of an environmental management system is a core requirement for the more stringent standards. No direct reference is made to the monitoring/management of energy usage. Existing emphasis is placed on the use of recyclable materials, bio-degradable materials and renewable energy. All of these recommendations will have positive impacts on any eventual calculation of a carbon footprint.

3.6 Final note

A number of other certification standards¹⁴ exist in the seafood industry e.g. Fishwise, Marine Stewardship Council, and Naturland. The standards discussed previously are chosen for their relevance to the aquaculture sector, not the broader fisheries sector.

¹⁷ BIM, Quality Standards : http://www.bim.ie/templates/text_content.asp?node_id=241

4. Existing Carbon Footprint Standards

A number of distinct standards exist for calculating the carbon footprint of organisations and products/services. The distinction between the two types of carbon footprint is important to note.

The tendency in the carbon standards market is that organisational footprints include direct fuel usage, electricity usage and a limited number of "other indirect" emissions, normally business travel, waste, water and a portion of employee commuting.

A product/service carbon footprint gives information specific to a product/service, e.g. a 250g serving of mussels has a specific carbon footprint. The tendency is that a product/service footprint includes a far greater range of emissions sources than an organisational footprint, becoming almost a full life-cycle analysis for emissions.

4.1 Greenhouse Gas Protocol

The Greenhouse Gas Protocol², from 2003, was the first internationally adopted carbon footprint standard. It was developed by a consortium convened by the World Resources Initiative¹⁸ (WRI) and the World Business Council on Sustainable Development¹⁹ (WBCSD). It was the first time that standards and guidance were provided for companies and other organizations preparing a GHG emissions inventory. By providing a common standard it allowed the following:

- Companies could monitor their own carbon footprint and set reduction targets
- Companies could compare their carbon footprint to that of competitors

4.2 ISO 14064/14065

The GHG Protocol was very much driven by large corporations who were seeking clarity in what was an emerging area, i.e. carbon emissions. As demand for the GHGP grew it became clear that an ISO certified standard was required. In 2006 the ISO 14064 standard was published to deal with three distinct areas of emissions management.

- ISO 14064-1:2006²⁰ : guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals, i.e. calculating an organisational carbon footprint.

¹⁸ WRI : <http://www.wri.org>

¹⁹ WBCSD : <http://www.wbcsd.org>

²⁰ ISO 14064-1:2006 : http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=38381

- ISO 14064-2:2006 : guidance at the project level for quantification, monitoring and reporting of greenhouse gas emissions reductions and removal enhancements. i.e. calculating emissions reduction which could then be sold as "carbon offsets".
- ISO 14064-3:2006 : guidance for the validation and verification of greenhouse gas assertions. i.e. used to independently verify the assertions made in ISO 14064-1.

In 2007, the ISO 14065 standard was published. This standard specifies accreditation requirements for organizations that validate or verify resulting GHG emission assertions or claims. i.e. in order to use ISO 14064-3 to verify a footprint calculated using ISO 14064-1, an organisation must be accredited using ISO 14065.

Currently there are no organisations accredited to ISO 14065 standard in Ireland and the Irish National Accreditation Board has no current plans to offer this accreditation. An Irish company, CMSE²¹, provides training course on all parts of ISO 14064.

The following diagram shows the place of each of the ISO 14064/14065 standards.

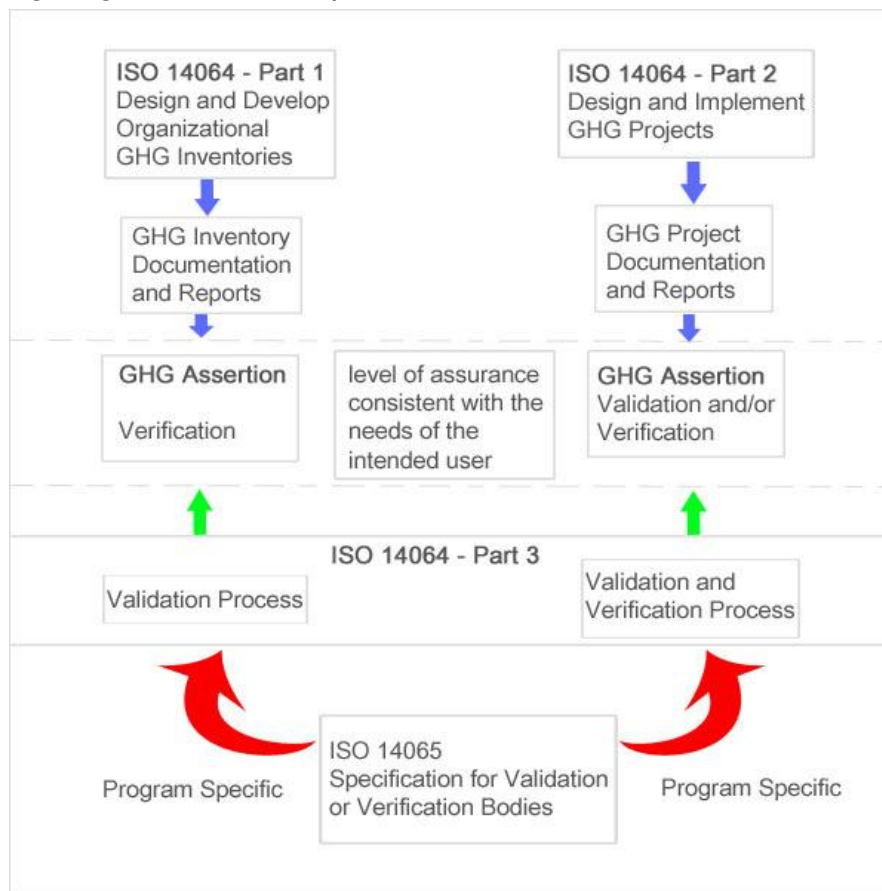


Figure 1 : ISO 14064/14065

²¹ CMSE : http://cmse.ie/GHG & CARBON_TRAINING-406.html

4.3 Carbon Trust Standard, UK.

The Carbon Trust Standard was created by the Carbon Trust to be applied to organisational carbon footprints. A detailed assessment procedure with an excel based tool for data capture is publicly available²². A detailed description of the methodology used is also provided. Once self-assessment is completed, the application is then assessed by an independent assessor who will pass/fail the application. In the case of a successful application, the organisation will have the right to use the associated logo (see section 6.4).

The costs of assessment are laid out below.

Organisation's annual energy expenditure*	Certification only**	Assisted certification**	Online certification***
Less than £50k	£1,000	£1,700	£450
£50k-£500k	£2,000	£3,500	n/a
£500k-£1.5m	£5,000	£8,000	n/a
£1.5m-£5m	£6,000	£10,000	n/a
£5m-£10m	£8,000	£12,000	n/a
More than £10m	£10,000	£15,000	n/a

Figure 2 : taken from <http://www.carbontruststandard.com/pages/Price-list>

4.4 PAS 2050, UK.

A standard for the calculation of the carbon footprint of a product was published by the British Standards institute as the Publicly Available Specification 2050²³. This standard provide a method for assessing the GHG emissions arising from products across their life cycle, from initial sourcing of raw materials through manufacture, transport, use and ultimately waste disposal or recovery. The term "product" is used to refer to both a physical product, e.g. a kilo of mussels, and a service product, e.g. a report on carbon footprints. The standard is co-sponsored

²² Carbon Trust : <http://www.carbontruststandard.com/pages/Assessment-criteria>

²³ PAS 2050 : <http://www.bsigroup.com/Standards-and-Publications/How-we-can-help-you/Professional-Standards-Service/PAS-2050>

by The Carbon Trust and the UK Dept of Environment Farming and Rural Affairs²⁴ (DEFRA).

The approach here is fundamentally different to that of the three organisational footprint standards described previously. Due to the strong support from the UK government, the standard is widely used throughout the UK and is gaining support from companies who consider the UK to be a major export market.

Certification under PAS 2050 is currently provided by four companies in the UK, and none in Ireland. One of these companies, the Carbon Trust Footprinting Certification Company, is a subsidiary of the Carbon Trust. Certification by this company allows the use of the Carbon Reduction Logo. (See section 6.4).

As with any lifecycle analysis study, the process is far more complex than an organisational level footprint. This is reflected in the associated costs. One of the UK accredited verification companies quotes a price of £1102 excl.VAT for a two year certification. This does not include the cost associated with following the PAS 2050 methodology.

4.5 Bilan Carbone, France

The Bilan Carbone²⁵ (Carbon Footprint) is the French equivalent of the Carbon Trust Standard. It is overseen by the ADEME (French State organisation) and is based on both ISO 14064 and the GHG protocol. The standard applies to organisational footprints. A law which was voted in July 2010 will make the calculation of a Bilan Carbone obligatory for all companies with more than 500 employees and all communes/towns with a population of more than 50,000. This obligatory regime comes into effect on July 1st 2011.

A further experimental phase has been launched by the French government²⁶ whereby companies are invited to partake in a national program of product carbon footprint calculation from July 1st 2011 to July 1st 2012. The purpose of this experiment is to define the manner in which product carbon footprint data is presented to the public and to define a standard in this matter. A standard, BP X30-323, has been published by the French standards authority (AFNOR²⁷). This standard has the same aspirations as PAS 2050 insofar as it provides a methodology to calculate carbon footprint figures for products and services. A briefing

²⁴ DEFRA : <http://ww2.defra.gov.uk/>

²⁵ Bilan Carbone : <http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=15729&m=3&catid=15730>

²⁶ Experimental labelling phase : http://www.developpement-durable.gouv.fr/spip.php?page=article&id_article=19201

²⁷ AFNOR : <http://affichage-environnemental.afnor.org/>

document on this emerging French standard has been provided by a UK based consultancy, SUSTAIN²⁸.

4.6 Final Note.

The different standards that exist for organisational and product footprints can lead to confusion on the part of consumers, a fact that is well highlighted in a presentation by the Farmers First²⁹ group, a global organisation representing most national farmers unions. This is also recognised at an ISO level and work is ongoing on two further ISO standards (ISO 14067 & 14066) which will eventually supplant existing national product carbon footprint guidelines.

Market research has however shown that consumers, and retailers, appreciate the availability of carbon footprint data whether that is at an organisational or product level. Research from the Carbon Trust³⁰ has given the following results.

- 67% of UK consumers surveyed are more likely to buy a product with a low carbon footprint.
- 44% would switch to a lower carbon product even if the brand was not their first choice.

Other research has shown that, regardless of the product's actual carbon footprint, consumers prefer products that are carbon labelled:

- 49% are more likely to buy a product if the label is displayed on the pack.
- 65% declared a label indicating that suppliers have committed to reducing a product's emissions would make them more likely to buy it.

²⁸ SUSTAIN, UK : <http://www.sustain.co.uk/resources/briefing-documents/french-environmental-labelling.aspx>

²⁹ Farmers First presentation : http://www.agritrade.org/documents/Carbon_Standards_Hague_Nov10.pdf

³⁰ Carbon Trust Document <http://www.carbontrust.co.uk/Publications/pages/publicationdetail.aspx?id=CTV043>

5. Relevant Initiatives in the Food Industry.

A number of initiatives have been undertaken to assess the impact of different food production systems. Some of these refer distinctly to the product carbon footprint, some to an organisational footprint and some to broader environmental indicators.

5.1 Life Cycle Assessment for Salmon from Ecotrust.

This report, funded by Ecotrust³¹, presents a global-scale life cycle assessment of farmed salmon. The report calculates the cumulative energy use, biotic resource use, and greenhouse gas, acidifying, and eutrophying emissions associated with producing farmed salmon in Norway, the UK, British Columbia (Canada), and Chile, as well as a production-weighted global average. The methodology used adheres to ISO 14040 (Life cycle assessment - Principles and framework) & ISO 14043 (Life Cycle Interpretation).

The report identifies the notable differences between different farming methods across all the indicators used and provides recommendations on how all of the indicators could be managed more effectively. Best case practises for all indicators are presented and referenced, including greenhouse gas emissions.

Comparisons are also made with other farming sectors with the following results for greenhouse gas emissions.

Farming Sector	Greenhouse gas emissions
Farmed Salmon (Global average)	2.15 tCO ₂ e/t
Pork (Swedish study)	3.3-4.4 tCO ₂ e/t
Beef (Belgian study)	14.5 tCO ₂ e/t
Poultry (US Study)	1.4 tCO ₂ e/t
Capture fisheries (average global)	1.7 tCO ₂ e/t

The report is noteworthy for the best practise advice given and for the comparison with other farming sectors. The research provides average figures for each regional industry and, as such, the figures are unlikely to be used as a product carbon footprint on labelling since it would disadvantage those regional producers with lower footprints than the average.

5.2 Leon De Bruxelles, French restaurant chain.

³¹ Ecotrust LCA of Salmon Farming : <http://www.ecotrust.org/lca/>

Leon de Bruxelles³² is a restaurant chain in France specialising in mussels, selling over 3000 tonnes of mussels per year. In 2009 it carried out a carbon footprint of its entire operations in accordance with the Bilan Carbone standard. The impetus for carrying out the carbon footprint came from their owner, a private equity firm OFI capital³³, which a similar policy for all of its companies. Their principal mussel supplier is Medithau³⁴, France who anecdotally indicates an emissions intensity of 1kg of CO₂e per kg of product packed³⁵.

It is noteworthy that neither Leon de Bruxelles nor Medithau have published the details of the carbon footprint calculations and both publish their summary figures via press releases and in a piecemeal manner. This form of partial disclosure does little for the credibility of the claimed carbon footprint and makes comparison with other footprints impossible.

5.3 Tesco, UK

In 2007 Tesco³⁶ became involved with the Carbon Trust as the largest test of the PAS 2050 draft and the Carbon Trust Carbon Reduction Label (see section 6.4). Over 120 products have had their product carbon footprint calculated and Tesco engages in detailed communication with their customers to explain the labelling system used. The scheme is part of a broader "Tesco Greener Living" initiative. A key factor in quality of data input into the PAS 2050 guidelines was the importance of Tesco to its suppliers. When a major customer request product carbon footprint data, a supplier is far more incentivised to provide data in a timely and detailed manner.

5.4 Bord Bia and the Irish Beef Industry.

Bord Bia have recently announced³⁷ that are coming to the end of a pilot project where 200 beef farmers have had carbon footprint related indicators monitored over a period of 6 months. Bord Bia have announced that, pending the final results of the pilot, they intend to roll out the auditing of carbon footprint indicators to the 32,000 farmers in the Beef and Lamb Quality Assurance Scheme. Under this scheme all farmers are audited at least every 18 months. The additional carbon footprint indicators are not considered to be pass/fail criteria for the QAS.

³² Leon de Bruxelles : <http://www.hr-infos.fr/actualite/secteur/restauration-commerciale/leon-carbone-peu-moules.html>

³³ OFI Private Equity Capital : <http://www.ofi-pecapital.com/inout/OFIRAUK.pdf>

³⁴ Medithau : <http://www.medithau.com/>

³⁵ <http://www.bordbia.ie/industryservices/alerts/Pages/Frenchmusselsectorinvestigatesitscarbonfootprint.aspx>

³⁶ Tesco Labelling : http://www.tesco.com/greenerliving/greener_tesco/what_tesco_is_doing/carbon_labelling.page?

³⁷ Bord Bia Footprint : <http://www.bordbia.ie/industryservices/connectezine/pages/bordbiaconnect-december2010.aspx>

The standard adhered to is PAS 2050 but individual product footprints are not being calculated, i.e. there will be not product footprint data shown on the product. In co-operation with Teagasc, an auditing model has been developed which has been accredited by the Carbon Trust, UK. Once the model is accredited, all results from the model are also accredited.

The label being sought for the Beef and Lamb QAS is the Carbon Trust Standard label³⁸. Bord Bia have adopted the position that providing specific product footprint information is not the primary concern of the customer and that a plan of action for reducing the product footprint is more relevant.

The reduced cost to the farmer and Bord Bia by this approach was a concern, albeit not the primary one. The decision to use the PAS 2050 standard reflected the fact that the UK is the prime market for Irish beef products.

6. Other issues

6.1 Different aquaculture types.

As the aquaculture sector itself is diverse, covering a range of production species and methods, there may not be a "one size fits all" solution for the sector. The various production methods are so different that any industry wide solution will have to be sufficiently flexible to take this into account. For example:

- Farmed salmon or trout: a major element in the carbon footprint is the type and source of the feed used for the fish³¹.
- Mussels/Oysters: The type of production, i.e. raft / bouchot / rope / dredged. The consumables, i.e. ropes / barrels.
- The varying types of craft used ranging from small punts to large ocean going vessels and the associated fuel usage.
- The various levels of processing that the product undergoes. Is the product cooked or raw?
- The types of transport associated with getting the product to market. Is it shipped fresh or frozen?

6.2 Carbon Credits/Offsets

In the earlier days of the carbon footprint industry, many industry sectors were attracted by the appeal of seeking out "carbon neutral" status for their products. The term "carbon neutral" is given to mean that the net effect of the product in terms of greenhouse gas emissions is zero. The most common method to achieving

³⁸ Carbon Trust Standard : <http://www.carbontruststandard.com/pages/home>

"carbon neutral" status was by purchasing carbon credits to offset whatever emissions were associated with the product. Examples of these carbon credits were support for afforestation schemes with the associated carbon sequestration in the trees. The cost associated with these carbon credits has historically been low, usually on a par with the price of CO₂ under the EU Emissions Trading Scheme³⁹. The current price is ~€14/tCO₂e⁴⁰.

The WWF takes the following position: "Offsetting should only be an option when every effort has been made to avoid or reduce greenhouse gas emissions," says Kirsty Clough, Climate Change Policy Officer at WWF-UK. "Only when all other avenues have been exhausted should consumers think of offsetting, using [Gold Standard](#) credits." This citation is taken for the WWF report on Carbon Offsets⁴¹.

Much has been made of the fact that shellfish sequester carbon⁴² as they create their shells, which are composed of calcium carbonate (CaCO₃). It is an accepted fact that every kilogramme of shell contains 12% carbon, the equivalent of 44% CO₂. This approach ignores the lifecycle CO₂ impact of the growth of shellfish, i.e. the shellfish industry creates favourable growth condition which causes the growth of more shellfish than would occur naturally. One study on clams⁴³ indicates that the CO₂ generated in the respiration of the clam over its lifetime would outweigh the amount of CO₂ sequestered in the shell.

The scientific uncertainty has not prevented one company, Aquaculture Carbon Ltd. from applying for a patent to gain the carbon credit value from shells. The marketing value of such an approach has not been proven as public cynicism towards claims of "carbon neutral" status is strong.

6.3 Specific Challenges for Ireland

A number of particularities of the Irish aquaculture present both challenges and opportunities.

- Distance to market. For the primary continental European market, Irish producers are relatively far away when compared to other major production zones. The extra distance to market, particularly when ferry travel is involved, means a comparably higher transport energy usage and this higher

³⁹ EU Emissions Trading Scheme : http://ec.europa.eu/clima/policies/ets/index_en.htm

⁴⁰ Point Carbon for EU ETS prices : <http://www.pointcarbon.com/>

⁴¹ WWF report on Carbon offsets. : http://assets.panda.org/downloads/vcm_report_final.pdf

⁴² Carbon Sequestration Potential of Shellfish, 2008 : <http://www.oystersssa.com.au/media/files/755.pdf>

⁴³ Study of clams as CO₂ generators : http://www.aslo.org/lo/toc/vol_48/issue_6/2086.pdf

transport related emissions. Offsetting this is that the distance from the main EU markets can also be used as an argument the purity/cleanliness of the environment in which Irish aquaculture operates.

- The high carbon footprint of Irish electricity. Although the emissions intensity of Irish electricity has dropped over the last decade (from 750gCO₂e/kWh in 2002 to 538gCO₂e/kWh in 2008) it still remains substantially higher than the EU-27 average (350gCO₂e/kWh in 2005). This impacts particularly on the carbon footprint of processed and frozen products where electricity has a major share in the production energy requirements.

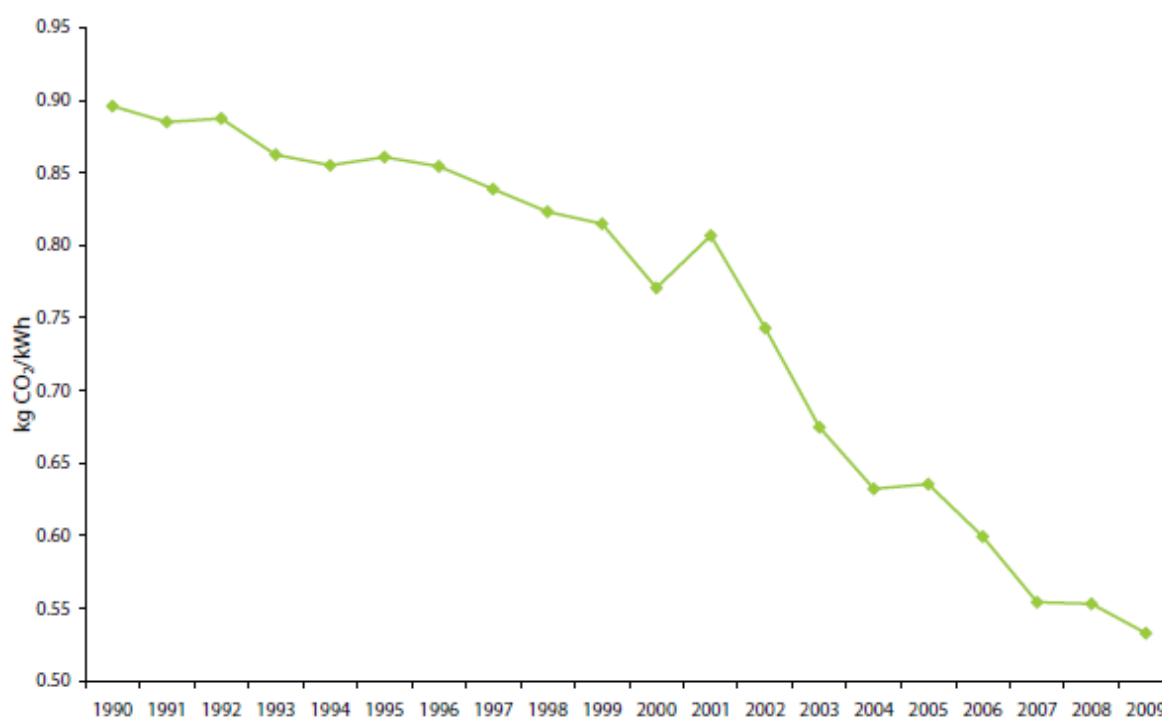


Figure 3 : Emissions intensity of Irish Electricity (Source SEAI Energy in Ireland 1990-2009⁴⁴)

6.4 Carbon Footprint Labelling

A number of carbon footprint labelling schemes are detailed below to give a sense of the direction that the market is currently taking.

- PAS 2050. The label below is available to any company who have certified a product via the Carbon Trust Footprinting Certification Company, a subsidiary of the Carbon Trust. The label shows specific product carbon footprint data.

⁴⁴ SEAI http://www.seai.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy_in_Ireland_1990-2009.pdf



Figure 4 : From <http://www.carbon-label.com/the-label/guide-to-the-carbon-reduction-label>

- Carbon Trust Standard. When an organisation has been certified according to the Carbon Trust Standard²², then it can make use of the logo below. Normally, when a company uses this logo on its product, it would also use it on its website with an associated link to details the organisational carbon footprint and the footprint reduction plans.



Figure 5 : Carbon Trust Standard logo

- LeClerc Supermarket Chain, France. The LeClerc supermarket chain in France has decided to include the carbon footprint data of a product on the **supermarket shelf label**, not on the product itself. The link is broken between the product footprint data and the product as soon as the product is taken from the shelf.



Figure 6 : LeClerc labelling: <http://www.jeconomisemaplanete.fr>

- Casino Supermarket chain, France. The Casino supermarket chain has chosen to present the footprint data on individual products, in a manner

similar to the "blackfoot" logo of the Carbon Trust Footprinting Certification Company in the UK.



Figure 7 : Casino labelling: http://www.produits-casino.fr/developpement-durable/dd_indice-carbone-indice.html

7. Conclusion / Recommendations.

- That the Irish aquaculture industry integrates the use of carbon footprint indicators in existing quality assurance schemes managed by BIM.
- That the initial standard by which data is collected is based on previous work carried out by Bord Bia for the beef industry. Bord Bia, via Pádraig Brennan, have indicated their willingness to share their experience with BIM. The common approach from all Irish food sectors is preferred to avoid confusion from a marketing perspective.
- That BIM strive to acquire certification according to the Carbon Trust Standard, underpinned by ISO 14064-1:2006.
- That BIM provide a process for sharing best-practices among producers within the various aquaculture sectors.
- That BIM publish all relevant data in the interests of transparency and public confidence, i.e. all monitoring/targets/progress is constantly publicly available.
- That BIM support the calculation of product level carbon footprints for producers with the use of specific standards for specific markets, e.g. PAS 2050 for UK, Bilan Carbone for France.
- That BIM monitor the ongoing standards development at an EU / Global level with particular attention to the Aquaculture Stewardship Council⁴ and ISO 14067/14066
- That BIM strongly discourage the use of carbon offsets and "carbon neutral" claims within the Irish aquaculture industry.
- That BIM aggressively defend the standards based approach taken and contest the use of any weaker carbon footprint methodologies within the global aquaculture industry.