Business & Carbon Measurement
on the island of Ireland

Acknowledgements

Overview

Driven by increasing concern and awareness of climate change, regulators, procurers and consumers of goods and services now expect businesses and suppliers to demonstrably and transparently reduce and communicate the greenhouse gas (GHG) impacts of their operations and products.

In recognition of these trends, this study into carbon measurement by businesses was commissioned by InterTradeIreland to assess the risks and opportunities for businesses in Ireland and Northern Ireland arising from increasing stakeholder and market requirements for business-related GHG information. Invest Northern Ireland and Enterprise Ireland provided their expertise on the steering group.

The study was undertaken through direct engagement with businesses in Ireland and Northern Ireland, underpinned by a comprehensive and international review of methodological and market developments in carbon measurement.

The outcomes of the study show that some businesses – particularly larger business in Ireland and Northern Ireland - are responding to market pressure to measure and report organisational carbon footprint. However, there are significant gaps in the application and understanding of product carbon measurement amongst all businesses.

Small businesses are unique in that they face challenges both with organisational and product carbon measurement.

Notably, many companies that are under direct market pressure to measure their carbon impacts do not currently do so.

This puts these companies at risk of non-compliance with the requirements of their supply chain partners and customers.

Generally, small enterprises are least equipped to measure and report their carbon impacts, and are therefore at greatest risk of non-compliance. The majority of these companies indicated that the lack of internal skills and resources combined with a lack of systems to collect the requisite data presented challenges and barriers to carbon measurement.

The rates of application and understanding of product carbon measurement methodologies were low amongst businesses of all sizes and from all sectors. Participating companies indicated they face challenges arising from inadequate internal capacity and skills and inadequate systems for collecting life cycle data. Only a minority of respondents cited the lack of accessible and easy to use guidance as a barrier, which is likely to be due to the fact that many companies were unaware that product carbon measurement is done on a life cycle basis and is therefore more complex than organisational carbon measurement.

Methodological and market trends in carbon measurement

The measurement of greenhouse gas emissions, commonly referred to as 'carbon footprinting', can be undertaken both at the organisational level - to assess emissions associated with management, business and operational activities; and at the product level - to assess greenhouse gas emissions over the life cycle of a product or service.

Organisational carbon footprinting is relatively well established methodologically and in practice.

This is largely due to the pioneering work of the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), who published the Greenhouse Gas Protocol (Corporate) Standard in 2001.

The maturity of organisational carbon measurement is also reflected in the fact that an international standard for corporate carbon measurement - ISO 14064-1, was published in 2006. ISO 14064-1 is fundamentally based on the GHG Protocol Corporate Standard, but is more stringent in its requirements.

The methodologies for product carbon measurement, on the other hand, have only been recently developed and indeed, are still being refined.

PAS 2050, developed in 2008 by BSI British Standards and co-sponsored by the Carbon Trust and the UK Department for the Environment, Food and Rural Affairs (Defra), was the first (and is still the only) fully developed methodology for measuring and reporting greenhouse emissions over the life cycle of a product or service.

Building on PAS 2050, two standards for measuring product emissions are currently in development. The GHG Protocol (Product) Standard, which is being developed by WRI and WBCSD, is due for publication in December 2010. ISO 14067, which is being developed by the International Organisation for Standardisation, is due for publication in March 2011.

Also associated with product carbon measurement is the growing interest in product carbon labelling. A carbon label depicts the life cycle GHG impacts of a product or service, which a customer can then consider in making a purchasing decision.

Some retailers, e.g., Tesco, Groupe Casino, Walmart and Migros, and other providers of goods and services have made varying public commitments to adopting product carbon labels. Also worthy of note is the fact that with passage of the 'Grenelle 2' Act in June 2010, France became the first country to introduce legislation mandating the carbon labelling of both domestic and imported products.

Carbon measurement activities amongst businesses in Ireland and Northern Ireland

The response of businesses in Ireland and Northern Ireland to the growing requirements for business-related GHG information has been varied. Many (although not all) larger business are measuring their organisational carbon footprint.

There are however, significant gaps in product carbon measurement amongst all businesses. Small enterprises are unique in that they face particular challenges and barriers in measuring both organisational and product carbon footprint.

Organisational carbon measurement activity amongst participating businesses

32% of all companies that participated in the study indicated that they currently measure the carbon footprint of their organisations. The vast majority of these companies, i.e., 85%, were medium sized and large enterprises.

Indeed, 58% of medium sized and large enterprises that participated in the study currently measure their organisational carbon footprint; compared to only 15% of small and micro enterprises.

The current lack of organisational carbon measurement activity amongst smaller businesses presents some risks. In particular, 27% of small and micro enterprises that participated in the study indicated that they

are coming under direct pressure from their customers and supply chain partners to measure and report organisational carbon footprint. Therefore, at least 12% of these companies are not currently meeting the requirements of their customers and supply chain partners.

Product carbon measurement activity amongst participating businesses

Whilst aware of the existence of product carbon footprinting as a business practice, many businesses were unaware that product carbon measurement considers life cycle emissions.

As such, 13% of all respondents initially indicated that they measure the carbon footprint of products and services.

Of these, 12% stated that they use no formal methods at all to measure their product carbon footprint. A further 48% indicated that they use 'other' approaches. However, none of the 'other' approaches listed were recognised as being published or formal approaches for the measurement of product life cycle GHG emissions.

Given the complexity of product carbon footprinting and the importance of robustness for benchmarking products' carbon performance, the lack of an underpinning methodology is a serious shortcoming.

In follow-up engagement, many of these respondents indicated that they had responded positively to the question about product carbon measurement because they measure the emissions arising from on-site production processes. In fact, the additional engagement revealed that those respondents who indicated that they measure product carbon footprint, but did not use any formal methods or used 'other' methods, had not considered product life cycle emissions.

When these companies are excluded from the proportion of participants that measure product carbon emissions, the percentage (as a proportion of all respondents) falls from 13% to 4%.

Notably, 34% of all respondents indicated that they are facing market pressure from retailers, supply chain partners and customers to provide product carbon metrics. At the moment therefore, 30% of the participating companies are at risk of non-compliance with the requirements of their key stakeholders.

Challenges and barriers to carbon measurement

As the rate of corporate carbon measurement is significantly lower amongst small enterprises, the specific challenges and barriers that they face are of particular concern.

The majority of these enterprises indicated that they face challenges in measuring their organisational carbon impacts due to a lack of internal capacity and skills to undertake organisational carbon footprinting (31%) and the lack of internal systems to collect the requisite data (24%).

A further 8% cited the lack of easily accessible guidance, whilst 11% indicated that they do not measure organisational carbon footprint because they believe that the cost of doing so would be too high.

Product carbon measurement, on the other hand, presents challenges to companies of all sizes and from all sectors.

The majority of companies, i.e. 24%, highlighted the lack of internal capacity and skills as a barrier to product carbon footprinting. Similarly, 21% of those respondents who do not currently measure product carbon footprint highlighted a lack of systems for collecting life cycle data as a barrier to doing so.

Interestingly, only 10% of respondents identified the lack of accessible and easy to use guidance as a barrier. Given the relative methodological complexity in measuring life cycle GHG emissions, the low proportion of respondents requiring guidance is likely to have resulted from an inadequate understanding amongst respondents of the life cycle dimension to product carbon measurement.

Whilst product carbon footprinting presents challenges to all companies of all sizes, small enterprises are likely to have more difficulties in overcoming them due to a lack of capacity, resources and skills.

Action Plan

The research has identified a series of potential actions which can be grouped to reflect differing timeframes and methods of implemention.

The quick wins, to be implemented quickly and using existing resources, include the development of easy-to-use guidance and carbon measurement tools. The intermediate actions, which could be developed through agency collaboration across the island, include provision of training, mentoring and other carbon measurement supports to smaller businesses. The initiatives for exploration, which present resourcing challenges and the need for further discussion over implementation, will include the potential development of online databases of life cycle carbon data and a cross-border demonstrator pilot to show best practice in carbon measurement.

1.1 Introduction

Increasing concern and awareness of climate change has put the issue of greenhouse gas (GHG) emissions firmly on the agenda of government, retailers, procurers and consumers of goods and services, and even the public at large.

Notably, Governments around the world - including those in Ireland[1] and the United Kingdom[2], have committed themselves to reducing greenhouse gas emissions. Similarly, some retailers and buyers of goods and services have made public commitments to reduce GHG emissions, arising both from their direct operations and indirectly from their supply chain.

These developments have significant implications for businesses – who, as both consumers and producers of goods and services, are major contributors to GHG emissions.

In Ireland for example, businesses are responsible for 44.4% of national GHG emissions (EPA 2009)[3]. In Northern Ireland, businesses account for 41.9% of all GHG emissions (AEA 2009)[4].

The importance of businesses to reducing GHG emissions is recognised by national government and other stakeholders. In recent years therefore, there have been increasing regulatory and market demands on businesses to demonstrably and transparently reduce their GHG impacts.

1.2 Measurement as a tool for reducing greenhouse gas emissions

The robust measurement of GHG emissions can provide businesses with a valuable tool for transparently managing climate change impacts, engaging stakeholders, realising market benefits and achieving regulatory compliance.

Furthermore, the information and insight derived from the GHG measurement process, i.e., the specific impacts of activities and products, can improve awareness amongst both internal and external stakeholders, thus facilitating more informed consumption and purchasing decisions.

In practice, the measurement of greenhouse gas emissions is commonly referred to as carbon measurement or carbon footprinting.

This emanates from the fact that as part of the calculations, the various greenhouse gases[5] are typically normalised to Carbon Dioxide equivalents (CO_2e)[6] based on their global warming potential.

This normalisation process enables overall greenhouse gas emissions to be reported as a single CO_2e figure, i.e. the carbon footprint, as opposed to providing a separate metric for each GHG.

[1] Department of Environment, Heritage and Local Government (2007) *Ireland's National Climate Change Strategy 2007 – 2012*.

[2] Department of Energy and Climate Change (2009): *The UK Low Carbon Transition Plan – National Strategy for Climate Change*.

[3] Environmental Protection Agency (2009): *Ireland's Greenhouse Gas Emissions in 2007*.

[4] AEA (2009): End User GHG Inventories for England, Scotland, Wales and Northern Ireland:1990, 2003 to 2007.

[5] At the Kyoto agreement, 37 Industrialised Countries (including the United Kingdom) and the European Community (including Ireland) committed to reducing emissions of six greenhouse gases (i.e., carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons and perfluorocarbons). Greenhouse gas measurement methods therefore tend to focus on these gases.

[6] Carbon Dioxide has a GWP of exactly 1 (since it is the baseline unit to which all other GHGs are compared).

At its most basic therefore, a carbon footprint is a measure of the exclusive total GHG emissions caused directly or indirectly by an activity, or which are accumulated over the life cycle of a product.

Carbon footprinting can be undertaken both within and outside the business context. Amongst other things, carbon footprinting can be applied to assess the greenhouse gas emissions resulting from individuals, populations, governments, companies, organisations, processes, products, services, industry sectors, etc.

In the specific business context, carbon footprinting typically takes two forms.

- **Organisational (or 'corporate') carbon footprinting:** This is the measurement of GHG emissions arising at the organisational level, i.e. arising from management, business and operational processes.

- **Product carbon footprinting:** This is the measurement of life cycle greenhouse gas emissions associated with a service or a product.

The output of the product carbon footprinting process can form the basis for a Carbon label. This is an informative label that can be attached to a product or service at the point of sale, to help consumers assess its total life cycle GHG emissions. Some retailers and governments have advocated carbon labels as a means of encouraging sustainable consumption and enabling consumers to consider climate change impacts in their purchasing decisions.

1.3 The All Island Carbon Measurement Study

InterTradeIreland's vision is for a globally competitive enterprise environment in which Ireland and Northern Ireland co-operate to ensure the optimal utilisation of economic resources, particularly knowledge resources, to drive additional trade and wealth creation.

In light of this vision, InterTradeIreland commissioned this study into carbon measurement by businesses to assess ongoing carbon measurement activities amongst business in Ireland and Northern Ireland, any associated challenges and barriers, and risks and opportunities to competitiveness arising from current approaches. Invest Northern Ireland and Enterprise Ireland provided their expertise on the steering group.

The specific objectives of the study are:

- To undertake a global review of trends in GHG measurement that may have implications for businesses in Ireland and Northern Ireland.

- To assess current awareness of GHG measurement as well as GHG measurement activities amongst businesses in Ireland and Northern Ireland.

- To highlight the challenges and barriers to GHG measurement faced by businesses in Ireland and Northern Ireland.

- To identify the competitive and business opportunities that businesses in Ireland and Northern Ireland can achieve from improved carbon measurement.

1.4 Structure of this report

This report summarises the key findings from the research. The remaining sections are set out as follows:

- Chapter 2 provides further context for the study by summarising the key market drivers for GHG measurement amongst businesses.

- Chapter 3 builds on this by providing an overview of the international methodological developments in GHG measurement.

- Chapter 4 details the outcomes of the engagement with businesses in Ireland and Northern Ireland, and discusses their carbon measurement activities, the challenges they face, market pressures, etc.

- Chapter 5 summarises the key findings and outcomes of the study.

2.1 Introduction

Businesses across the globe now measure and report the greenhouse gas emissions emanating both at the organisational level, and from the products and services they provide.

This is reflected for example, by the fact that 3,000 organisations from 60 countries currently measure and disclose their greenhouse gas emissions through the Carbon Disclosure Project[7] - an independent not-for-profit initiative that maintains a database of primary corporate carbon metrics. Similarly, a recent study by the Carbon Trust[8] showed that 24% of businesses in the UK currently measure their organisational carbon footprint.

This interest in carbon measurement has been driven by recognition that it can realise business benefits. Some of the key ones are discussed below.

2.2 An indicator of resource efficiency

There is a direct correlation between volume of emissions of greenhouse gases and resource consumption, particularly the consumption of energy. In that regard, greenhouse gas emissions can serve as useful indicator of overall business efficiency.

In recent years, resource efficiency has become of significant interest to businesses, as they have sought to minimise the higher operating costs and uncertainty that have been driven by increasing energy prices and continuing volatility in commodity markets. In addition to providing a summary overview of efficiency, the carbon measurement and monitoring process can highlight 'carbon hotspots' or efficiency gaps, and thus identify where corrective action is required.

[7] www.cdproject.net

[8] Carbon Trust (2009): *We'll all have to pay for carbon say business finance heads. Carbon Trust Press release (18th August 2010).*

2.3 Demonstrating compliance with carbon-related regulations

Governments around the globe – including the UK and Ireland, have set national targets for reducing greenhouse gas emissions. In order to achieve these targets, these governments have implemented a range of new GHG-related policies and regulations – with implications for businesses.

The UK Climate Change Act (2008) for example, binds the government to achieving an 80% reduction in carbon emissions by 2050 (relative to 1990 levels).

One of the initiatives that the UK government has implemented to meet this target is the Carbon Reduction Commitment (CRC) - a mandatory carbon trading scheme for medium sized UK organisations. The CRC commenced on 1st April 2010, and participating organisations are required to monitor and report greenhouse gas emissions and to purchase allowances to

TESCO

"Tesco will develop a carbon footprint labelling measure for all products sold in store" - Speech by Sir Terry Leahy, Tesco Chairman (2007)

"We now have 500 Carbon-footprinted products in the UK and South Korea" – Tesco 2009 Corporate Responsibility Report Tesco

GROUPE Casino

"Our new environmental label, the Casino Carbon Index ... debuted in June 2008 on some 100 products."
" The index represents the quantity of greenhouse gas emissions at the most important stages in the product life cycle. Expressed in grams of CO2 equivalent per 100 grams of finished product, the index allows consumers to compare products."

– Groupe Casino 2009 Annual Sustainability Report Groupe Casino (France)

Walmart

"We will lead the creation of a Sustainability Index. The Index will bring about a more transparent supply chain, drive product innovation and, ultimately, provide consumers the information they need to assess the sustainability of products. It will mean more innovative products that lower carbon output."

- Speech by Mike Duke, President and CEO of Walmart (2009) Wal-Mart (USA)

11 Bearing Points (2011): *Green Supply Chain Monitor 2010-11.*

cover each tonne of CO_2e they emit. The CRC therefore provides a clear and direct financial incentive for organisations to reduce their emissions, or risk having to purchase emission allowances to cover any shortfall.

Furthermore, both Ireland and the UK are signatories to EU ETS Directive 2003/87/EC, which established the EU Emissions Trading Scheme (EU ETS) – a Europe-wide 'cap- and trade' system for allocating and trading greenhouse gas allowances. The scheme covers all the biggest 'point source' CO_2 emissions across the EU25, including power stations, cement manufacturing, iron and steel, pulp and paper, oil refining, glass and ceramics, and all other industrial facilities with thermal capacity greater than 20MW.

Notably, in order to comply with the CRC and EU ETS and minimise the associated risks, participating organisations have to robustly measure, monitor and manage carbon emissions.

At least one country, France, has also passed regulations for product carbon measurement and labelling. With the passage of 'Grenelle 2' (a bill on the national commitment to the environment) in June 2010, France became the first country in the world to require the carbon labelling of both domestic and imported products.

This clearly has implications for any company that currently supplies goods to the French market, or which plans to do so in the future.

2.4 Reputational improvement and differentiation in the marketplace

In a number of studies, consumers have consistently indicated that they would consider the climate change impacts both of products and of the companies that produce them, when making purchasing decisions.

In a survey of UK shoppers conducted by Gfk NOP[9] for example, 67% of respondents indicated that they would be were more likely to buy a product with a low carbon footprint. Similarly, in a survey of consumers in Ireland conducted by Business in The Community (BITC)[10], 86% of respondents indicated that they would be more willing to buy a product with demonstrable low carbon attributes.

Recognising this growing awareness, some companies therefore view the measurement and reporting of corporate and product carbon metrics as a way of differentiating and strengthening their brand in the market place.

2.5 Meeting requirements of retailers and procurers of goods and services

Retailers and other procurers of goods and services are now aware of the market, regulatory and wider business benefits that can be achieved through the reduction and measurement of greenhouse gas emissions.

Many of these organisations – who are also influential buyers, have therefore committed themselves not only to reducing their direct greenhouse gas emissions, but also to reducing carbon emissions throughout their supply chains.

To enable this, many retailers and major procurers of goods and services have developed 'sustainable procurement' strategies, in which they commit to work with suppliers and service providers to demonstrably improve low carbon performance across the supply chain[11].

In addition, some retailers (including Tesco in the UK, Walmart in the USA, Groupe Casino of France and Migros of Switzerland) have made varying commitments to attach *carbon labels* to their products. This will have implications for companies who supply these organisations, who will now be obligated to provide the input metrics to facilitate the carbon measurement process.

9 GfK NOP (2006): *Consumer perspectives on the carbon impacts of their purchases.*

10 Department of Energy and Climate Change (2009): *The UK Low Carbon Transition Plan – National Strategy for Climate Change.*

2.6 Trend towards 'green' procurement in the public sector

Globally, public authorities are major consumers and procurers of goods and services. In Europe, public authorities spend approximately €2 trillion annually on procuring goods and services, equivalent to some 17% of the EU's gross domestic product.

In Ireland, the annual procurement budget of the public sector in 2010 was estimated to be €16 billion[12]. In 2010 the Northern Ireland Executive spends £2.4bn on goods and services, in addition to £300m per annum on local Government purchasing[13]. In the wider UK, total spend on public sector procurement is in excess of £220 billion per annum[14].

There has been an active shift towards 'green' public sector procurement across Europe. The foundations for this trend was established by the EU Sustainable Development Strategy adopted in June 2006, which set a policy objective to bring the average level of EU green public procurement (GPP) up to the standard achieved by the best performing Member States by 2010[15].

A further EU communication in 2008, confirmed that target as 50% of all tendering procedures. This communication also provided a definition for GPP as "*a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured*."[16]

In order to achieve the specified EU target, member states have sought to develop their own GPP plans. Consultation is currently ongoing in Ireland for example, on a national action plan for GPP. Part of this consultation involves assessing whether the target of 50% is 'sufficiently ambitious'.

The Northern Ireland Executive published its Sustainable Procurement Action Plan in 2008. As part of this plan all public procurement exercises in Northern Ireland, must integrate sustainable development considerations. Furthermore, all public contracts awarded after 1 October 2008 that exceed the EU thresholds must, where appropriate, include provision to develop a strategy which will achieve relevant social, economic or environmental outcomes.

In light of this shift towards green and sustainable procurement, suppliers and companies that measure and demonstrably minimise greenhouse gas emissions, can be better positioned to sell to the public sector now and in the future.

12 Department of the Environment, Heritage and Local Government (2010): *Discussion Paper – Towards a National Action Plan on Green Public Procurement.*

13 Committee for Finance and Personnel (2010): *Report on the Inquiry into Public Procurement in Northern Ireland.*

14 OGC (2010): Collaborative Procurement - *Progress against uptake of endorsed deals.*

15 Council of the European Union (2006): DOC 10917/06 - *Review of the EU Sustainable Development Strategy (EU SDS).*

16 Commission of the European Communities (2008): *COM(2008)400 - Public procurement for a better environment.*

2.7 Consideration of carbon reduction in public sector project appraisal

The UK Government now considers forecasted carbon reduction in its appraisal of public sector projects. A similar approach has been recommended by the Comhar Sustainable Development Council for adoption in Ireland. Contractors and suppliers that can demonstrably deliver the forecasted reductions and the pre-defined targets for cost effectiveness, may therefore be better positioned when tendering and bidding for public sector contracts.

Resultant reductions in greenhouse gas emissions have been considered in the appraisal of public sector policies and projects in the UK since 2002. (For background of early approaches for valuing and including carbon impacts in UK public sector appraisal, please see government guidance published in 2002[17] and 2007[18] respectively).

In 2009 the UK Government implemented a new approach for valuing and integrating carbon reductions in public sector appraisal, moving from a system based on the shadow price of carbon to a 'target-consistent' approach[19]. As per this new approach, the forecasted EU ETS market traded price of carbon is now used to value the carbon impacts of projects in sectors covered by the EU ETS. Where the project is in a non-EU ETS sector, a 'non-traded price of carbon' is now used, based on estimates of the marginal abatement cost (MAC), i.e. the incremental investment in low carbon processes and technologies required to meet the UK's emissions reduction targets.

As the business case (i.e. the cost effectiveness) for any project will become stronger as the reductions in carbon increase per given level of costs, suppliers that can demonstrably deliver these reductions are likely to be viewed more favourably in tenders for public sector contracts.

A paper published in 2008[20] by the Comhar Sustainable Development Council - the forum for national consultation and dialogue on sustainable development in Ireland, suggested a framework that could be implemented in Ireland for valuing and integrating carbon reductions in the appraisal of Central Government capital projects. Comhar recommended that the value of carbon should be based on forward and average EU ETS market prices up to 2020 and on marginal abatement costs thereafter.

17 HM Treasury (2002): *Estimating the social cost of carbon emissions.*

18 Department for Environment, Food and Rural Affairs (2007): *The Social Cost Of Carbon And The Shadow Price Of Carbon: What They Are, And How To Use Them In Economic Appraisal In The UK.*

19 Department of Energy and Climate Change (2009): *Carbon Valuation in UK Policy Appraisal: A Revised Approach.*

20 Comhar SDC (2008): *Carbon Pricing for Central Government Cost Benefit Analysis in Ireland.*

2.8 Meeting the requirements of shareholders and investors

There is some evidence that for many institutional investors, including many large pension funds and asset managers, climate change impacts are rapidly becoming a key consideration in investment decisions.

This interest in climate change is driven both by a desire to realise the business opportunities associated with the global transition to a low carbon economy, and to minimise regulatory and market risks associated with carbon-intensive ventures[21].

Furthermore, investors are increasingly embracing socially responsible investment, i.e. an investment approach that considers environmental, social, ethical and governance factors, with a view to minimising adverse impacts on society.

A recent survey of investors conducted by the Institutional Investors Group on Climate Change (IIGCC) for example, found that 80% referenced climate change in their investment policies or belief statements[22].

The interest of investors in climate change impacts and carbon performance is also reflected in the work and increasing profile of the Carbon Disclosure Project (CDP),

which was launched in the UK in 2000, and gathers and disseminates corporate carbon data[23]. Over 475 institutional investors (with a combined asset base of $55 trillion) and 55 purchasing organisations and government bodies, use the CDP as a source of information about companies' carbon emissions.

Over 3,000 organisations in some 60 countries around the world now measure and disclose their greenhouse gas emissions and climate change strategies through CDP. This database is used by shareholders and investors to assess the climate change and carbon related business risks of planned or ongoing investments.

The CDP has published annual UK-specific reports annually since 2003. These reports assess the carbon disclosure trends and performance amongst the largest 350 companies by capitalisation in the FTSE 500.

The CDP was launched in Ireland in 2008 and since then two Ireland-specific reports have been published in 2009 and 2010 respectively. These reports assess the carbon disclosure trends amongst the largest members of the Irish stock exchange (by capitalisation) and the Irish companies that participate in the EU-Emissions Trading Scheme.

21 The International Energy Agency (IEA) estimates that the market for low carbon technology and solutions is around US$10 trillion by 2030.

22 Institutional Investors Group on Climate Change (2009): *Investor Statement on Climate Change Report 2009.*

23 www.cdproject.net

2.9 Minimising corporate risks

Many businesses are now aware of the risks that greenhouse gas emissions pose to regulatory compliance, supply chains, market positioning and branding. In that regard, many companies are seeking to manage and reduce greenhouse gas emissions in order to minimise the associated risks.

Carbon metrics can be useful for assessing and gauging exposure to these risks, and for identifying 'carbon hotspots' where improvement is required to manage them.

3.1   Introduction

Fundamentally, the underlying principles of organisational and product carbon measurement are broadly similar. Their specific requirements for application differ however.

This difference in application arises mainly because organisational carbon footprinting is typically concerned with the GHG produced by the business operations of a company or its subsidiaries. Product carbon measurement on the other hand takes a life cycle view, and therefore considers emissions from activities, such as 'extraction of raw materials' or 'use' of the product, that may not be directly undertaken by the company itself. The differing approaches to the two types of carbon measurement are explored on the next page.

3.2   Approaches to Organisational Carbon Measurement

Organisational Carbon Footprinting is now well established methodologically and in practice. This is largely due to pioneering work of the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), who together published the Greenhouse Gas Protocol (Corporate) Standard in 2001. Since then, there have been a number of published guidelines on corporate carbon footprinting, including a suite of international (ISO) standards that enable external verification.

Fundamental principles of the GHG Corporate Standard

Relevance	• Ensure the GHG inventory appropriately reflects the GHG emissions of the new company and serves the decision-making needs of users-both internal and external to the company.
Completeness	• All relevant emissions sources within the chosen inventory boundary need to be accounted for so that a comprehensive and meaningful inventory is compiled.
Consistency	• Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any relevant factors in the time series.
Transparency	• Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
Accuracy	• Data should be sufficiently precise to enable intended users to make decisions with reasonable assurance that the reported information is credible.

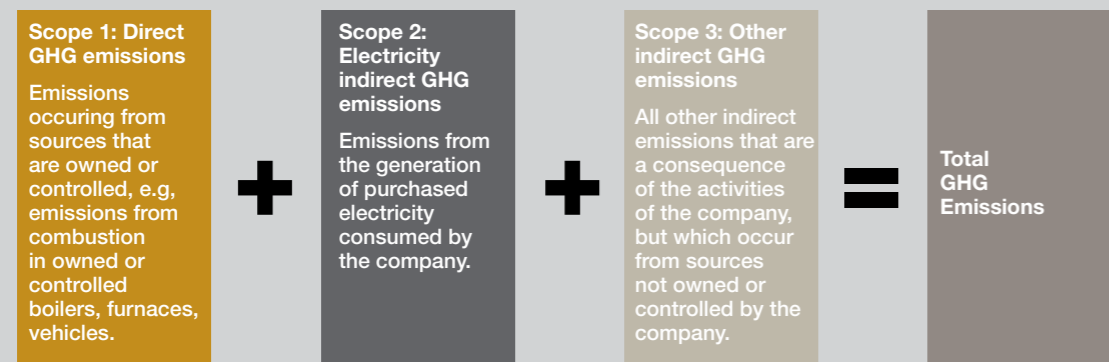### 3.2.1 The Greenhouse Gas Protocol (Corporate) Standard

The Greenhouse Gas Protocol (Corporate) Standard - first published by WRI and WBCSD in 2001 and revised in 2004, is generally regarded as the first comprehensive methodology for measuring corporate GHG emissions. As such, it has formed the basis for many of the subsequent guidance and standards for organisational GHG measurement that have since been published internationally.

The GHG protocol Corporate Standard[24] is based on the five principles below, which provide the framework for its inherent processes, recommendations and outcomes.

Undertaking a carbon footprinting exercise in line with GHG Protocol (Corporate) Standard, can generally be divided into six key stages as below.

- **Define organisational Boundaries:** Business operations vary in their legal and organisational structures. Identifying what parts of the organisation should be included in the GHG estimation can sometimes be difficult. In this stage therefore, those businesses and operations that constitute the company for the purpose of measuring and reporting GHG emissions are defined.

- **Identify Greenhouse Gas Sources:** To create an accurate account of emissions and to facilitate tracking of 'carbon hotspots', the GHG protocol categorises emissions into three "scopes".

Figure 1: Description of the 3 emission scopes for classifiying emission sources

Scope 1: Direct GHG emissions Emissions occuring from sources that are owned or controlled, e.g, emissions from combustion in owned or controlled boilers, furnaces, vehicles.	**Scope 2: Electricity indirect GHG emissions** Emissions from the generation of purchased electricity consumed by the company.	**Scope 3: Other indirect GHG emissions** All other indirect emissions that are a consequence of the activities of the company, but which occur from sources not owned or controlled by the company.	**Total GHG Emissions**

$$ Scope\ 1 + Scope\ 2 + Scope\ 3 = Total\ GHG\ Emissions $$

The GHG Protocol mandates that all relevant Scope 1 and 2 emissions are calculated and reported. Measurement of Scope 3 emissions, whilst recommended, is optional.

- **Collect activity data and choose emission factors:** The key activity in this stage is the calculation of emissions data for each of the three scopes. This is normally achieved by applying official emission factors to convert activity data into CO2 equivalents. The emission factors can be derived from official sources such as the UK Department for Environment, Food and Rural Affairs (Defra)[25] in the UK, and Sustainable Energy Authority of Ireland (SEAI)[26] in Ireland.

- **Apply calculation tools:** This stage delivers the estimated emissions.

- **Roll-up GHG emissions data to corporate level:** During this stage, the estimated emissions from the various business operations, activities and geographies are brought together to give an overview of the organisation's overall performance.

- **Report emissions:** The final stage of the process is to develop a GHG emissions report that is complete, consistent, accurate and transparent; and to accordingly disclose it to stakeholders.

3.2.2 ISO 14064 Carbon Footprinting Standard

Published in 2006, ISO 14064 is comprised of three standards, respectively detailing specifications and guidance for the measurement of greenhouse gases at the organisational and project levels - and for validation and verification.

Of relevance to organisational GHG measurement is ISO 14064 – 1 (Specification with guidance at the organisation level for the quantification and reporting of greenhouse gas emissions).

Fundamentally, ISO 14064 – 1 is based on the GHG Protocol Corporate Standard, although they differ in their focus.

A key difference stems from the fact that the GHG Protocol is intended to be an overarching framework that generally suggests and proposes best practice actions that organisations can take to measure and report corporate emissions. As such, the GHG protocol tends to rely on the word 'should' rather than 'shall'.

ISO 14064 on the other hand, establishes verifiable minimum standards for compliance, and is very clear about what must be done during the carbon footprinting process. The word 'shall' therefore features heavily.

24 www.ghgprotocol.org

ISO 14064-1 also places a greater emphasis on document retention and record keeping, and mandates that organisations 'shall retain and maintain documentation supporting the design, development and maintenance of the GHG inventory to enable verification'.

Although not mandatory, there is also a greater emphasis on verification under ISO 14064-1. The Standard is clear that organisations 'should' conduct verification in a way that is consistent with the needs of the intended user and the principles of ISO 14064-3 (Specification with guidance for the validation and verification of greenhouse gas assertions).

ISO 14064-1 approach to categorising emission sources

A key difference between the GHG Protocol and ISO 14064 is with regard to the system of categorising sources of greenhouse gas emissions.

Whereas the GHG Protocol delineates emission sources as scope I, II, and III, ISO 14064 categorises emission sources as 'direct', 'indirect' and 'indirect other.

- *'Direct GHG' Emissions* are emissions from greenhouse gas source owned by the organisation

- *'Energy indirect GHG' Emissions* are emissions that arise from the generation of imported electricity, heat or steam consumed by the organisation

- *'Other indirect GHG' Emissions* are emissions (other than Energy Indirect GHG emissions) that arise as a consequence of a company's activities, but occur from sources not owned or controlled by the company.

3.2.3 UK Government guidance on measuring greenhouse gas (GHG) emissions

In September 2009, Defra, in partnership with the Department for Energy and Climate Change (DECC), published guidance for UK organisations on how to measure and report their GHG emissions[27].

Publication of the guidance was driven by the UK Climate Change Act (2008) which placed a requirement on the UK Government to publish guidance on the measurement or calculation of GHG emissions by 1st October 2009. This is intended to be in preparation for another provision of the Climate Change Act (2008), i.e. that the UK Government introduces regulations requiring mandatory reporting of GHG emissions under the Companies Act 2006 by the 6th of April 2012.

The guidance is based on the GHG Protocol Corporate Standard, and as such, also aligns with ISO 14064 - 1. It is solely a simplified guide, and is not intended to be mandatory or to supersede any existing guidance and standards. It sets out 11 recommendations as follows.

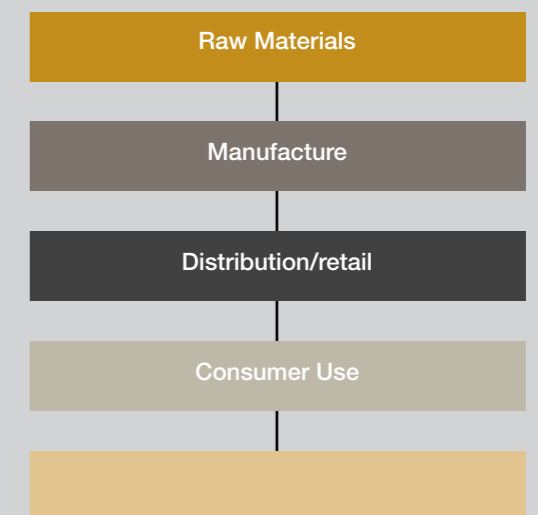### Key recommendations of the UK Government Guidance

- **Recommendation 1:** Apply the chosen approach for defining the organisational boundary consistently, and for most organisations this will be the financial control approach.

- **Recommendation 2:** Measure or calculate total emissions on a global basis,i.e., include overseas operations and facilities.

- **Recommendation 3:** Measure or calculate emissions that fall into your scopes 1 and 2. (Measurement of scope 3 emissions is discretionary).

- **Recommendation 4:** Measure or calculate emissions from the six GHGs covered by the Kyoto Protocol.

- **Recommendation 5:** Where using standard emission factors (to convert activity data to emissions), use Defra / DECC GHG conversion factors for UK emissions.

- **Recommendation 6:** Report total GHG emissions as a gross figure in tonnes of CO2 equivalents (CO2e).

- **Recommendation 7:** Report purchased or sold emissions reductions (i.e. carbon credits and green tariffs), then report a net figure in tonnes of CO2e, in addition to the gross figure.

- **Recommendation 8:** Report on total scopes 1 and 2 emissions using an intensity ratio (e.g., tonnes of CO2e per total £m sales revenue).

- **Recommendation 9:** Provide supporting explanations in the GHG Report, for options and decisions taken in the measurement process

- **Recommendation 10:** Choose and report on a base year, which should be the earliest year that verifiable emissions data is available for either a single year, or a multi-year average.

- **Recommendation 11:** Develop a base year recalculation policy. Update your base year emission calculations following any significant structural changes or new information.

3.3 Approaches to Product Carbon Measurement

Product carbon footprints provide an estimate of the total amount of greenhouse gases emitted during the life cycle of goods and services.

In this context, the life cycle covers all key stages from raw materials through to disposal of the product.

Figure 2: Stages of a product's full life cycle

Raw Materials

Manufacture

Distribution/retail

Consumer Use

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25 Defra (2010): 2010 *Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting. (This can be found at: www.defra.gov.uk)*

26 SEAI (2008): SEAI Emission Factors 2008. *(This can be found at: www.seai.ie)*

27 Defra and DECC (2009): *Guidance on how to measure and report your greenhouse gas emissions.*
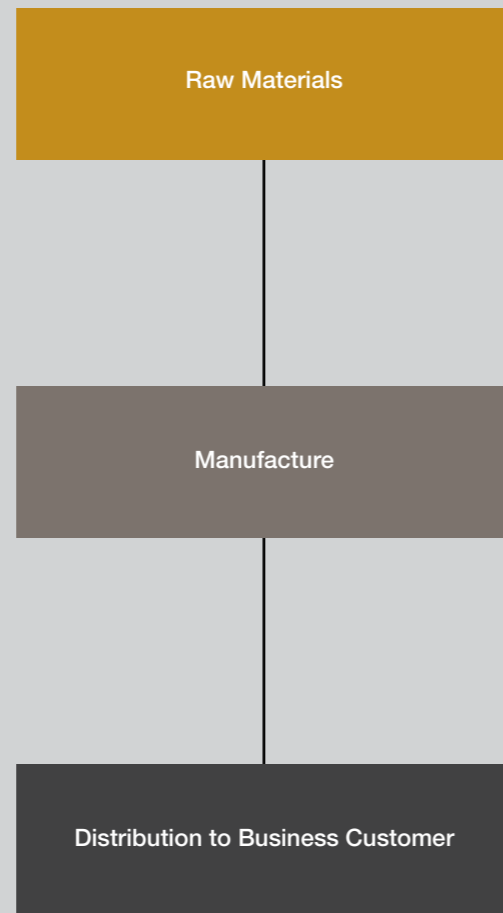
Figure 2: Stages of a product's full life cycle

It is sometimes the case however, that products are used as inputs into other products with widely divergent use and disposal characteristics (e.g. aluminium can be used in drinks cans or aeroplanes). As such, it is not always possible to estimate full-life cycle emissions for the 'input' product.

In these cases, it is possible to base the product carbon footprint on an intermediate life cycle, i.e., a cradle to gate approach, which captures raw materials through production up to the point where the product arrives at a new organisation, including distribution and transport to the customer's site. However, an intermediate life cycle would exclude additional manufacturing steps, final product distribution, retail, consumer use and disposal/recycling.

Although there is currently no formal international standard for the measurement and reporting of product carbon footprint[28], a number of methodologies have been developed – typically based on life cycle thinking and existing methods for Life Cycle Assessment (LCA).

Figure 3: Intermediate life cycle, e.g., for business-to-business goods

Raw Materials

Manufacture

Distribution to Business Customer

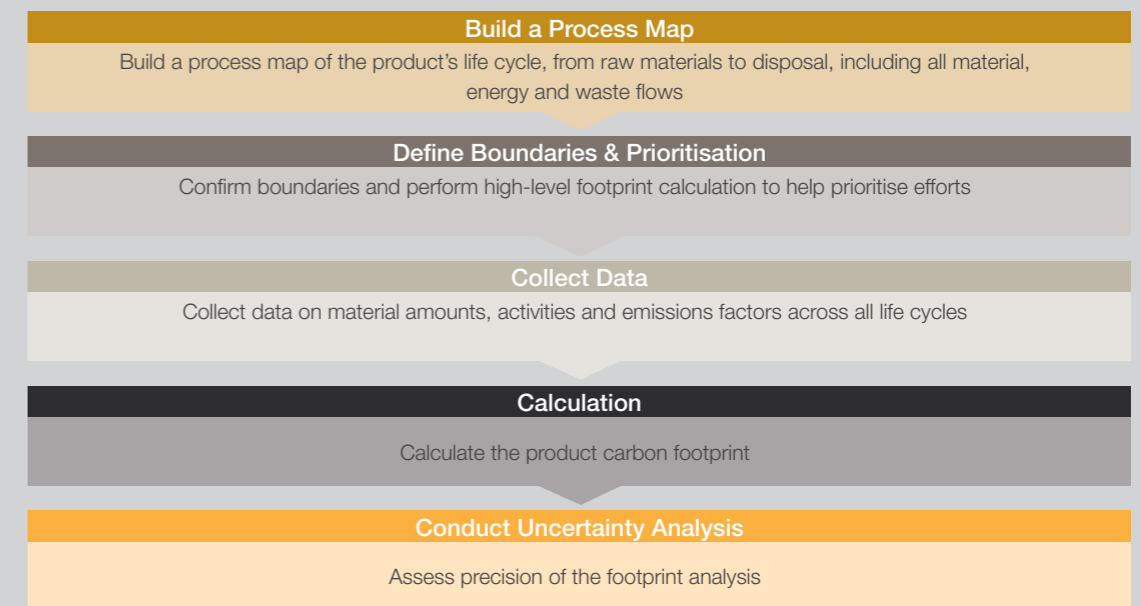### 3.3.1 PAS 2050 Specification for product carbon footprinting

The most established methodology for product carbon footprinting is PAS 2050 - a publicly available specification[29] for assessing product lifecycle GHG emissions, developed by BSI British Standards and co-sponsored by the Carbon Trust and Defra.

The PAS 2050 methodology allows for assessments both of full life cycle emissions, i.e. business-to-consumer (or cradle to grave) and intermediate life cycle emissions, i.e. Business to Business (or cradle to gate).

The five key phases for applying PAS 2050 are outlined below.

■ **Build a Process Map:** The objective of this step is to identify all materials, activities and processes that contribute to the chosen product's life cycle. This would typically involve breaking down the selected product's functional unit into its constituent parts (e.g. raw materials, packaging) at each stage of the life cycle. For services, the 'life cycle' involves more than just inputs, outputs and processes. The process map will include all stages and potential emission sources from any activity that contributes to the delivery or use of the service.

Figure 4: Key stages in applying PAS 2050

Build a Process Map
Build a process map of the product's life cycle, from raw materials to disposal, including all material, energy and waste flows

Define Boundaries & Prioritisation
Confirm boundaries and perform high-level footprint calculation to help prioritise efforts

Collect Data
Collect data on material amounts, activities and emissions factors across all life cycles

Calculation
Calculate the product carbon footprint

Conduct Uncertainty Analysis
Assess precision of the footprint analysis

28 *Please note however, that an international standard ISO 14067 is currently in development.*

■ **Definition of Boundaries and prioritisation:** This stage sets the context for the calculation by defining the scope of the product carbon footprint, i.e. the cycle stages, inputs and outputs that will be included in the assessment.

The PAS 2050 methodology requires the boundaries to include all 'material' emissions generated as a direct or indirect result of the chosen good or service being produced, used and disposed/recycled.

■ **Collecting data:** In this stage, the life cycle activity data is collected for the product. As there is potential for uncertainty around the product 'use' phase of the life cycle, PAS 2050 requires the disclosure of all 'use' phase calculations, data sources, assumptions, etc.

■ **Calculating the product carbon footprint: The carbon footprint** of a product is the sum of all materials, energy and waste across all activities in a product's life cycle multiplied by their emission factors.

Issues to consider when calculating a product carbon footprint

- **Delayed emissions:** Emissions that are released over time through long use (e.g. light bulbs) or final disposal phases cannot be treated as a single release of emissions. Therefore, these emissions must be calculated to represent the weighted average time in the atmosphere.

- **Carbon in products:** Some products that are formed from plant-based carbon (not fossilised) actually store carbon and therefore create 'negative' emissions by taking GHGs out of the atmosphere. Calculations must consider this storage benefit in these instances.

- **Agriculture:** When assessing a product derived from livestock, the non-CO_2 emissions from the livestock, their manure or soils should be included and estimated.

- **Land use changes:** If the product's supply chain directly caused non-agricultural land to be converted to agricultural use on or after 1 January 1990, then GHG emissions associated with the land use change must be included in the carbon footprint calculation.

- **Sampling:** When an input to a process arises from multiple sources, data can be collected from a representative sample for calculating emissions. E.g. a flour mill may include data from a representative sample of grain sources, rather than from all farms that provide it with grain.

- **Energy:** Emission factors for energy should include all emissions associated with the entire life cycle of the energy input, including mining, generation, distribution, consumption and waste.

- **Transport:** Any GHG emissions arising from any transport required during the product's – and its raw materials' – life cycle should be included in the carbon footprint assessment. Emission factors for transport should include emissions associated with creating and transporting the fuels required.

- **Allocation:** Allocation (i.e. partitioning of GHG emissions from a single process to the different outputs of that process) is required where a process contributing to a given product's life cycle results in more than one useful product, i.e. a co-product, or by-product other than waste.

- **Waste:** Waste generates emissions when it breaks down in landfills or is incinerated. These emissions must be considered in the assessment of the responsible product's footprint.

■ Checking uncertainty: The objective of this step is to double-check the assumptions and calculations underpinning the calculations. Amongst other things, uncertainty analysis will help to improve confidence in the footprint, and any comparisons and decisions that emanate from it. Whilst PAS 2050 does not mandate uncertainty analysis, it may be necessary to meet data quality specifications.

3.3.2 Product Life Cycle Accounting and Reporting Standard

The World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) – who together developed the GHG Protocol *Corporate Accounting and Reporting Standard* (2004), have developed a GHG Protocol Product Standard.

The standard was published in November 2010, having been road tested in companies from diverse industries, sectors and geographic locations.

The Standard outlines the following key stages for assessing and reporting product carbon footprint:

- **Establishing the methodology:** In principle, two methodologies exist for undertaking product carbon footprinting. The attributional approach provides information about the GHGs emitted directly by a product over its life cycle; whilst the consequential approach provides information about the GHGs emitted, directly or indirectly, as a consequence of changes in demand for the product. The standard mandates that calculation of product carbon footprints should adopt the attributional approach as it is consistent with the intent of reporting the direct emissions arising from the product.

- **Defining the functional unit:** In order to calculate the emissions arising from a product, it is necessary to develop a description of the product system to be analysed. The standard mandates that at least five key issues need to be considered, namely the quality of the product, service life, use patterns, technical performance characteristics and end-of-life attributes.

- **Boundary setting:** The standard mandates companies to map the life cycle of the product from raw material acquisition through to end-of-life and disposal, and to perform full life cycle GHG calculations (i.e. cradle-to-grave) for all products where applicable.

29 *As a Publicly Available Specification, PAS 2050 is not to be regarded as a British Standard, European Standard or International Standard.*

The standard also allows for intermediate products however, i.e. where a cradle-to-grave assessment may not be feasible as the eventual fate of a product could be unknown.

- **Collect the data:** In this stage, the emissions factors, activity data and/or GHG emissions for the various processes associated with a given product, are identified and collated. The standard requires that primary data (i.e. derived through direct measurement) must be used whenever possible. Where primary data is not feasible, high quality secondary data is allowable.

- **Assessment of data quality and uncertainty:** The standard explicitly specifies that a data quality assessment shall be undertaken for all emissions sources that cumulatively sum to 75% of total product emissions, beginning with the largest emissions source. Once the data quality assessment is completed, a statement regarding the overall methodology appropriateness and consistency of the inventory shall be provided.

- **Assurance:** Two forms of assurance are permissible under the standard. First Party ('self or 'internal') assurance, is where persons from within the organisation, but independent of the footprinting process, conduct first party internal assurance.

The alternative approach, i.e. Third Party ('external') assurance, is where persons from a certification or assurance body conduct independent third party external assurance.

- **Reporting:** Once the company and its Assurers are confident in the calculations, the product carbon footprinting process and outcomes need to be publicly disclosed in a report. A specified requirement of the standard is for the report to be divided into a summary and detailed report to address the needs of different audiences.

The intention is that the high-level summary report will be understandable to a general audience, while the detailed report would be of interest to product carbon footprint experts.

3.4 Product carbon labelling schemes

The output of the product carbon footprinting process is an estimate of the total greenhouse gas emissions (in CO_2e) emitted over the life of a product.

Increasingly, retailers and other sellers of goods and services are seeking to communicate that information to consumers and end users through labels attached to products and services. The carbon label would typically indicate the total greenhouse gas emissions that are emitted over the life cycle of the product, in grams or kilograms CO_2e.

The aim is that carbon labelling will encourage behavioural change in consumers to achieve more sustainable consumption patterns.

One of the first retailers to commit to putting a carbon label on its products was the UK retailer Tesco in 2007. Since then, other large retailers, including Walmart in the USA, Groupe Casino of France and Migros of Switzerland, have made similar commitments.

Amongst other things, this in turn puts a requirement on businesses that supply these retailers to derive and provide the product carbon metrics to enable carbon labelling.

Initial interest in carbon labelling was market driven, primarily by retailers. Since then, governments in many countries have taken an interest in adopting or promoting product carbon labelling.

With the passage of 'Grenelle 2' (the bill on the national commitment to the environment) in June 2010, France became the first country in the world to pass legislation for the mandatory carbon labelling of products. The requirement will apply to domestic and imported products.

Other national governments have also been involved in developing carbon labelling schemes. These include the Japanese Ministry of Economy, Trade and Industry (METI), which has led the development of the Japanese Carbon Footprint of Products (CFP) Label; the South Korean Ministry of Environment, which is running a Pilot of a Low Carbon Product Certificate scheme; and Thailand's Ministry of Natural Resources and Environment, which is also piloting a product carbon labelling scheme.

A study by the ClimateChangeCorpestimates that at least 16 different carbon labels have been developed since 2007[30].

Some of the more established product carbon labelling schemes are described below.

Carbon Reduction Label	Developed by the Carbon Trust – a UK based not-for-profit company, the Carbon Reduction Label is an easily recognisable on-pack label that indicates a product carbon footprint and a commitment that the producer is reducing the figure. Companies that achieve the label for their products are required to calculate the exact footprint of the product using PAS 2050. The company must then commit to reducing these emissions over 2years. The UK retailing giant Tesco was one of the first companies to start using the Carbon Reduction label on its products. **For further information visit**: www.carbon-label.com
Indice Carbone	Developed and used exclusively by the French retailing group, Casino Groupe, this index uses a life cycle approach to estimate the quantity of greenhouse gas generated over key stages of the product's lifecycle, from production to retail sale. Notably however, the 'Use' phase of the product is not included in the calculations. Casino Groupe plans to label more than 3,000 products with the index, and has piloted it on 100 products. **For further information visit**: www.produits-casino.fr/developpement-durable
The Climatop carbon label	Developed by two Swiss NGOs, Ökozentrum Langenbruck and myclimate, this scheme awards a product the 'approved by climatop' labels, if the emissions are (at least 20%) lower than other products or services of the same product category. Migros – a Swiss Retailer, uses the climatop label to inform customers of the carbon impacts of their products. They have applied the label to 104 of their products. **For further information visit**: http://www.climatop.ch
Japanese Carbon Footprint of Products (CPF) Label	In April 2009, the Japanese Government launched the trial of a Carbon Footprint System aimed at providing information on the life-cycle emissions of greenhouse gases associated with the production, processing and use of consumer products. Since 2009, a number of products have been authorised to carry the label in Japan. **For further information visit**: www.cfp-japan.jp
The Climate Consious Carbon Label	Currently being developed by Climate Conservancy - a non-profit organisation founded by scientists at Stanford University, the Climate Conscious rating is based on the concept of product carbon intensity and is derived using LCA. In addition to the carbon intensity figure, the scheme uses a Silver, Gold and Platinum rating to inform users of the relative performance of the product. The approach is currently being tested with a number of products from diverse firms, including Walmart. **For further information visit**: www.climateconservancy.org

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4.1   Introduction

In order to assess carbon measurement activities and associated trends in Ireland and Northern Ireland, a comprehensive survey was undertaken of companies across the island.

Specifically the survey sought to ascertain the level of awareness amongst businesses of carbon measurement, market demand for carbon metrics and information, current carbon measurement activities, barriers and challenges as well as business' views on how these can be overcome.

The survey took the form of a short online questionnaire, and invitations to participate in the survey process were sent directly to about 1,500 businesses in Ireland and Northern Ireland. Target participants were selected carefully to ensure an adequate mix of companies from the two jurisdictions, from diverse sectors and of diverse sizes.

In addition to sending survey invitations directly to businesses, the project team also engaged a number of business and trade associations, who were very helpful in circulating information about the survey to their members.

Ultimately, 159 businesses completed the survey which exceeded the target sample size of 100 respondents that had been set at the survey design phase.

The analyses below present the key findings, patterns and trends from the responses provided.

4.2   Profile of the respondents to the survey

The two regions of relevance to the study, i.e., Ireland and Northern Ireland, were adequately represented in the survey, in line with their respective sizes.

Figure 5: Split of survey participants by region

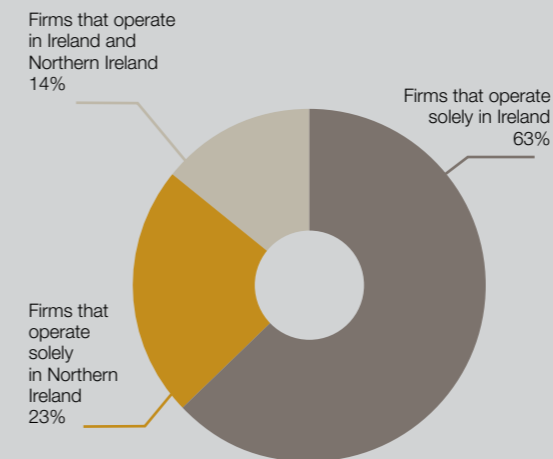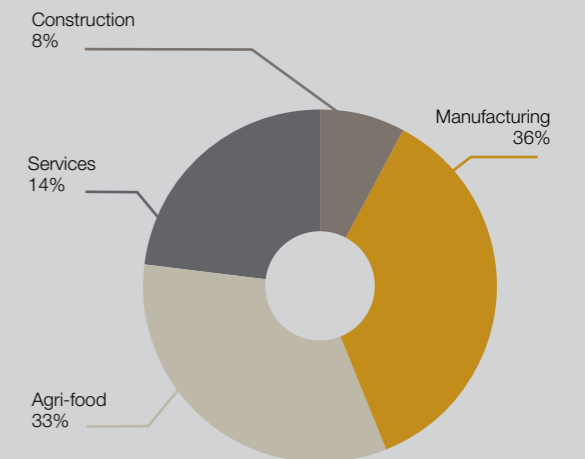Firms that operate in Ireland and Northern Ireland 14%

Firms that operate solely in Ireland 63%

Firms that operate solely in Northern Ireland 23%

Figure 6: Split of survey participants by sector

Construction 8%

Manufacturing 36%

Services 14%

Agri-food 33%

As shown in Figure 5, 63% of respondents to the survey operate solely in Ireland, whilst 23% operated solely in Northern Ireland. Notably, 14% operated both in Ireland and Northern Ireland, which provides the potential for a unique cross-border view on some of the issues.
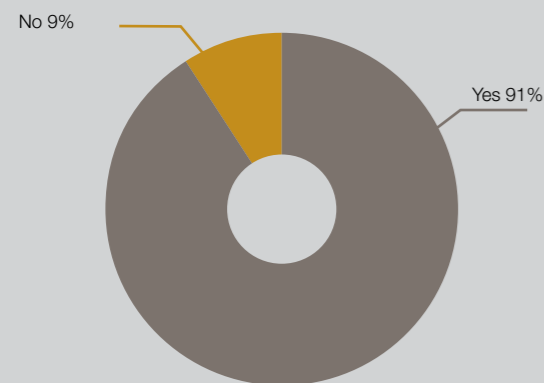
As can be seen in Figure 6, there was also adequate cross-sector representation in the sample of respondents.

The largest representation was from the Manufacturing sector, which accounted for 36% of all respondents.

This was followed by the Agri-food sector which accounted for 33%, whilst Services and Construction accounted for 23% and 8% respectively.

Efforts were made during the survey process to maximise representation from the diverse sectors by actively targeting them during the survey process and engaging trade associations both in Ireland and Northern Ireland to assist with circulating the survey to their members.
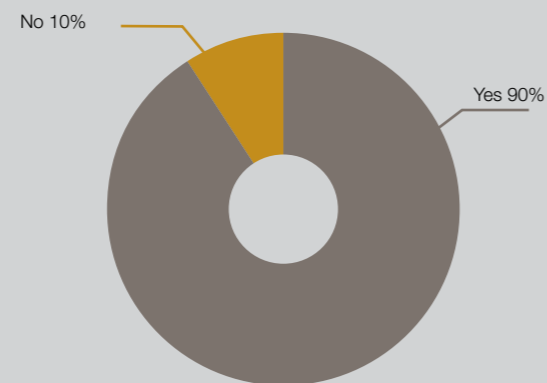
4.3 Awareness of Carbon Measurement amongst the sample

One of the many objectives of the All-Island Carbon Measurement study was to assess the level of awareness about carbon measurement amongst businesses in Ireland and Northern Ireland. Towards this end, participants were asked whether or not they were aware that businesses now measure the carbon footprint of their organisations and products.

The responses showed a high level of awareness amongst the sample. In particular, 91% of respondents indicated that they are aware that companies now measure their organisational carbon footprint. Similarly, 90% indicated that they are aware that some businesses measure the carbon footprint of their services and products.
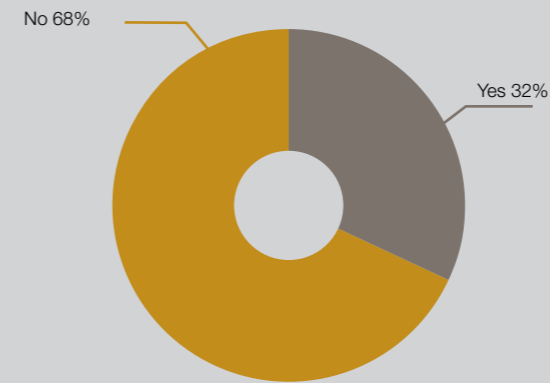
Figure 7: Awareness of organisational carbon measurement

No 9%

Yes 91%

Figure 8: Awareness of product carbon measurement

No 10%

Yes 90%

4.4 Organisational carbon measurement amongst the sample

The high level of awareness amongst the sample did not automatically translate into carbon measurement.

Figure 9: Organisational carbon measurement amongst the sample
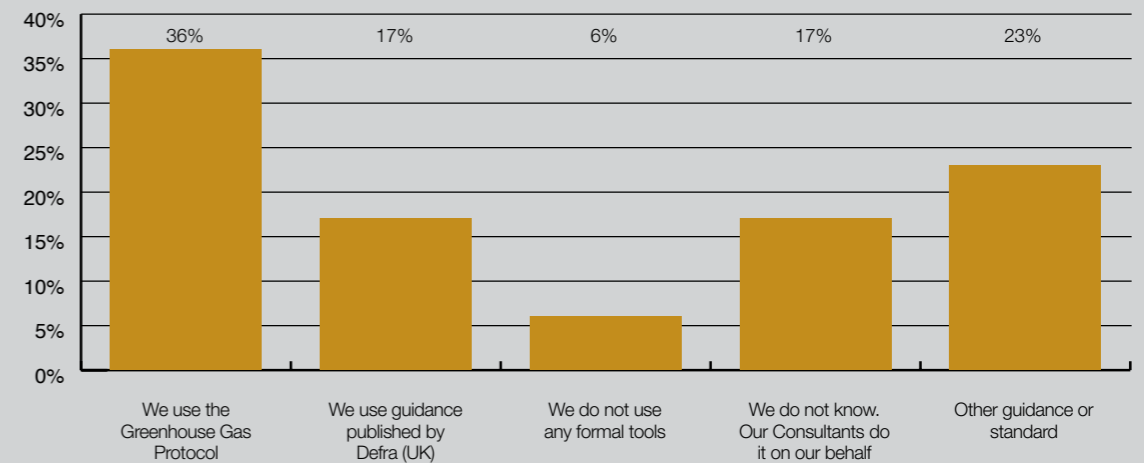

No 68%

Yes 32%

When asked about their current carbon measurement activities, just under a third of all respondents, i.e., 32%, indicated that they currently measure the carbon footprint of their organisations.

This would make measurement rates amongst the sample slightly higher than those in Great Britain, where a recent study by the Carbon Trust showed that 74% of companies do not currently measure their carbon footprint[31].

Further analysis suggested however, that the proportion of respondents who measure their organisational carbon footprint is likely to be lower than the initial 32% – especially if robustness is considered.

To assess how these respondents are measuring their organisational carbon footprint, a separate question was asked about the methods and guidance, if any, that they use to do so. The results are shown in Figure 10 below.

Figure 10: Approaches for organisational carbon measurement amongst the sample

36%	17%	6%	17%	23%
We use the Greenhouse Gas Protocol	We use guidance published by Defra (UK)	We do not use any formal tools	We do not know. Our Consultants do it on our behalf	Other guidance or standard

31 Carbon Trust: *We'll all have to pay for carbon say business finance heads. Carbon Trust Press release (18th August 2010).*

Used by 36% of respondents, the GHG Protocol Corporate Standard is the most commonly used methodology for organisational carbon footprinting. This is encouraging, as the GHG Protocol Corporate Standard is undoubtedly the best recognised methodology for organisational carbon measurement around the world. It is also the basis for many other organisational carbon measurement standards and guidance such as ISO 14064, and even the Defra Guidance for carbon footprinting which is used by 17% of respondents who currently measure their organisational carbon footprint.

Boxmore Plastic Ltd. (Ballyconnel, Co. Cavan)

Boxmore Plastics employs about 200 staff and supplies a range of packaging and plastic containers to the food, drink, chemicals and healthcare sectors.

Boxmore Plastics have been measuring its organisational carbon footprint since 2009. This was driven both by the requirements of customers and supply chain partners, and by Boxmore Plastics desire to reduce its carbon impacts as part of a 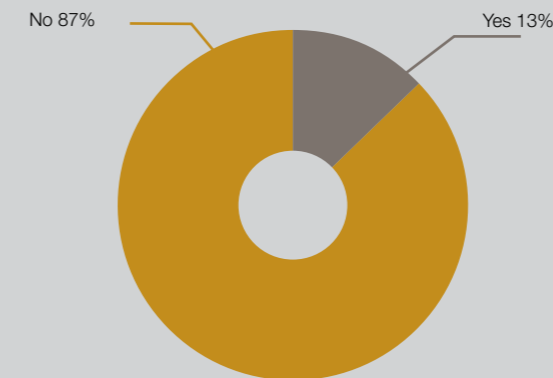wider sustainability programme. Measurement of organisational carbon footprint is undertaken in accordance with GHG Corporate Protocol, which is applied with support from an external consultant.

To normalise the carbon footprint in line with varying company activities Boxmore report their carbon footprint using a carbon intensity metric, i.e., CO_2e per tonne production output.

The company has set a target to reduce its organisational carbon footprint by 2.5% annually, and is exploring a number of initiatives for achieving this.

"Efficiency is key to our business approach. Carbon measurement and our associated targets for carbon reduction, provide us with valuable tools for improving and tracking our resource efficiency, whilst simultaneously meeting the increasing demands of our customers for carbon metrics and information."

Dermot Gates
Managing Director, Boxmore Plastics

It also notable that 6.4% of those respondents who indicated that they measure the carbon footprint of their organisations, do not use any formal approaches. This raises questions about the robustness of the organisational carbon footprinting outcomes and practice amongst these organisations. Indeed, if these firms are excluded from the 32% of respondents (see Figure 9 above) who indicated that they currently measure organisational carbon footprint, then the respondents who measure their organisational carbon footprint falls to 30% of all participants.

Figure 10 also shows that that 23% of respondents who currently measure their organisational carbon footprint, indicated that they used "Other" methodology or guidance, i.e. other than the GHG Protocol Corporate Standard or the Defra guidance. In these instances, respondents were asked

to indicate in a free text field what these other guidance or standards are. Most of these respondents who specified 'Other' approaches indicated that they use publicly accessible online carbon footprint calculation tools, available for example at www.Change.ie, the Carbon Trust's website (www.carbontrust.co.uk) and at www.Repak.ie[32].

Figure 11: Product carbon measurement amongst the sample

No 87%   Yes 13%

Such online calculation tools can be useful for obtaining a one-off snapshot of organisational GHG emissions. However, the objective of carbon measurement is ultimately carbon reduction, which requires regular monitoring and feedback.

As online calculation tools estimate emissions based on the inputs that are plugged into them at a single point in time, they do not facilitate the monitoring and identification of trends over time that can then enable carbon reduction.

Furthermore, the output of many online calculation tools is a single overall measure of GHG emissions. As such, the outputs lack the granularity to enable identification of 'carbon hot spots', i.e. carbon-intensive areas in the production process where corrective action could be required.

There were however, a minority of "Other" responses that point to some confusion amongst respondents around the meaning of organisational carbon footprinting. References were made in the text fields, for example, to the 'Building Energy Rating' (BER) – a method for assessing the energy efficiency of buildings, which has no relevance to organisational carbon footprinting.

If this minority is also removed from the 32% shown in Figure 9, the percentage of respondents who actually measure organisational carbon footprint falls to 28%.

4.5 Product carbon measurement amongst the sample

The survey responses showed that product carbon measurement presented particular challenges to participants, both in its application and in respondents' understanding of what it means in practice.

Notably, 13% of all respondents indicated that they measure the carbon footprint of products and services.

32 www.repak.ie is the website of a voluntary initiative designed to help Irish industry meet producer responsibility obligations under the EU directive on packaging and packaging waste.

Further analyses and follow up engagement revealed however, that the proportion is likely to be lower. Moreover, if only 'robust' life-cycle based approaches are considered, the number is likely to be lower still.

As with organisational carbon measurement, a separate question in the survey sought to assess the robustness of respondents' product carbon footprinting approaches, by asking them what methods, if any, they use.
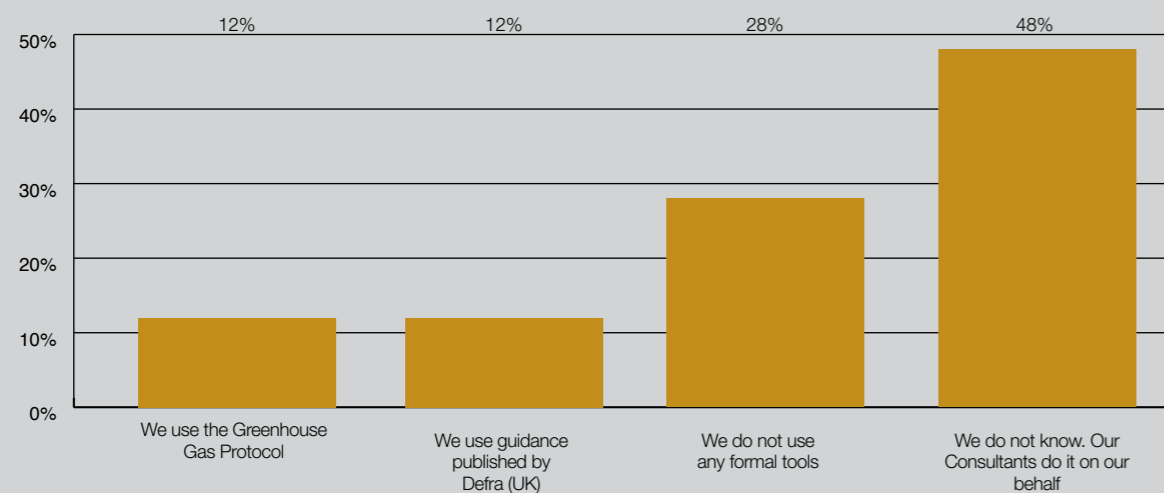
As can be seen in Figure 12 below, only 12% of the respondents who indicated that they currently measure the carbon footprint of their products use the PAS 2050 methodology.

Notably, 12% of the respondents who stated that they measure the carbon footprint of products or services, indicated that they use no formal methods at all to do so.

Given the uniqueness and complexity of product carbon footprinting, and the need to holistically consider life cycle emissions, this is a serious shortcoming. It is therefore reasonable to assume that these respondents are unlikely to be comprehensively measuring product carbon footprint. If they are accordingly removed from the 13% shown in Figure 11 above, then the proportion of respondents who measure product carbon footprint falls to 11%.

Figure 12 also shows that 48% of respondents who believe themselves to be measuring the carbon footprint of products and services, indicated that they use 'Other' methodologies to measure product carbon footprint. They were asked to detail these 'Other' approaches in a text field. Notably, none of the 'Other' approaches listed by these respondents was recognised as a 'life cycle based' methodology.

Figure 12: Approaches for product carbon measurement amongst the sample

Some of the approaches suggested by respondents are shown in Box 1.

This raised some concerns within the project team about respondents' understanding of what 'product carbon measurement' means in practice.

Box 1: Approaches for product carbon measurement amongst the sample

- Guidance & calculations from SEI Energy Managemnet workshop
- The customer that wanted their product measured had their own methodology set out. Other wise we would use the GHG Protocol
- Common sense
- We use ISO 14001 and ISO 14065
- Our company use a global tool
- Partial assessment - only of those services under our own direct control i.e. Scope 1 & 2 emissions

To investigate these concerns, a series of follow-up telephone calls were made to companies who had indicated that they measure product carbon footprint using 'Other' methods (and who had also provided contact details).

Many of the respondents that we contacted indicated that they had responded positively to the question about product carbon footprinting, as they include the energy consumption from the on-site production process, in calculation of organisational carbon footprint. Notably, none of these companies had measured life cycle emissions.

If these companies are also removed from the proportion of companies who say they measure product carbon footprint, then the proportion, i.e. the 13% shown in Figure 11 above, falls to 4%.

4.6 Market pressure for carbon measurement

Other studies have identified market pressure, i.e. from supply chain partners and customers, as a key driver for carbon measurement amongst businesses. In particular, retailers[33] have taken a lead in promoting product carbon measurement as a means of providing customers with information about the embedded carbon in products.
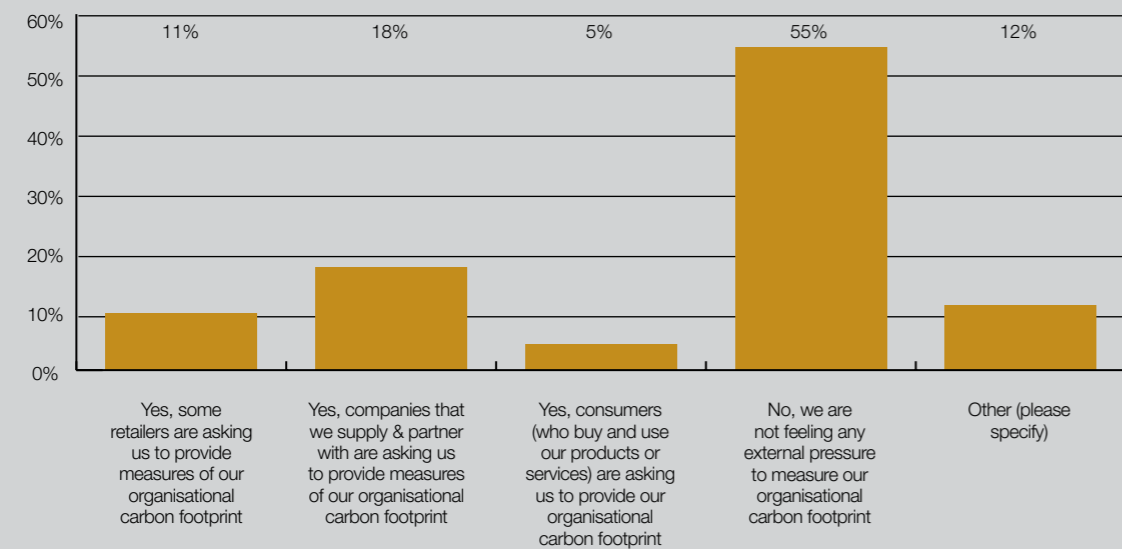
These trends could have implications for businesses in Ireland and Northern Ireland. To assess the risk that market requirements for carbon measurement poses to business in Ireland and Northern Ireland, survey participants were asked whether they are coming under any supply chain pressure to measure and report the carbon footprint of their organisation or products, respectively.

The results are discussed below.

Market pressure for organisational carbon measurement

36% of all respondents indicated that they have come under external pressure from Retailers (11%), Supply Chain Partners (18%) and Consumers (5%), to provide measures of organisational carbon footprint. The breakdown of responses is shown in Figure 13 below.

Figure 13 Market pressure for organisational carbon measurement

33 See for example, Tesco in the UK, Groupe Casino in France and Migros in Switzerland.

**Lagan Cement
(Co. Westmeath, Ireland))**

Located at Kinnegad, Co Westmeath, Lagan Cement supplies bulk and bag Cement to both the domestic and export markets from a modern cement manufacturing facility.

With the increasing trend towards sustainable construction, the carbon impact of cement and other construction inputs is now a key consideration for Lagan Cement's customers.

Lagan Cement has sought to pro-actively meet these requirements by adopting low carbon manufacturing techniques and inputs that reduce the carbon attributes of its cement products. These have included for example, moving to renewable and locally sourced alternative fuels. Indeed, renewable and alternative energy sources now meet over 60% of the company's thermal energy needs.

Carbon measurement, which is undertaken by a dedicated Sustainability Manager, enables Lagan cement to communicate the low carbon attributes of its products and processes to customers.

"Many of our customers now consider the carbon impacts of cement and other construction inputs. Having implemented a number of measures to reduce the embedded carbon in the cement that we supply, carbon measurement provides us with a useful way of communicating this to our customers."

**David Tobin Sustainability Manager
Lagan Cement**

The 12% of respondents who indicated that they had 'Other' drivers for measuring organisational carbon footprint were asked to expand on their responses. Some of the clarifying comments provided by these respondents are shown in Box 2.

Notably, whilst not coming under any external direct pressure, a high proportion of these respondents (approximately 8% of all respondents), indicated that they want to measure organisational carbon footprint because they see value in doing so themselves (without any external pressure).
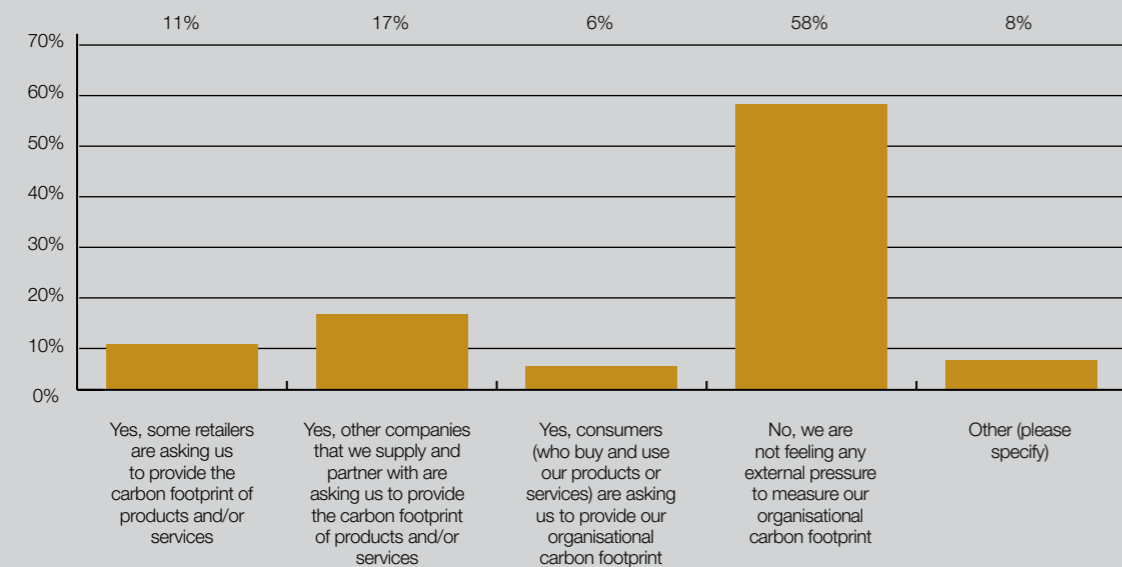
A further 3% indicated that there was some push from investors and regulators.

- "No pressure from either suppliers or customers but we believe it is important for us to know our carbon impacts"

- "No external pressure, but we are aware that it will be imminent"

- "We have not had any formal external requests or demand, but we are expecting it"

- "We believe that that there might be benefits to brand"

- "As a PLC, we are members of the Carbon Disclosure Project (CDP) and therefore provide details of our carbon footprint to our investor stakeholders"

- "Carbon measurement and management is a priority driven more so by investor requirements at this stage"

- "We have always been committed to maintaining high standards of environmental management. We believe that carbon measurement is a natural expansion of that"

- "As an indicator of environmental best practice, carbon measurement is an exercise we would like to undertake"

Market pressure for product carbon measurement
When the question was asked in the context of product carbon measurement, 34% of all respondents indicated that they were facing market pressure to provide carbon metrics relating to products and services. When broken down, this is driven by retailers (11%), supply chain partners (17%) and customers (6%).

Figure 14: Market pressure for products and services carbon measurement

4.6.1 Compliance with market requirements for carbon measurement

In scenarios where there are some market requirements for carbon measurement, and the relevant businesses are unable to provide the metrics, there is a risk that the business may be unable to comply or meet market requirements.

To assess the extent to which such risks of market non-compliance existed amongst the survey participants, further analysis was undertaken to see whether respondents facing market demand for carbon measurement were providing the required metrics.

Compliance with requirements for organisational carbon metrics
The analyses showed that 45% of the survey respondents who are facing some market pressure from retailers, supply chain partners or customers, to measure organisational carbon footprint, currently do not do so.

This is shown graphically in Figure 15 opposite.

From Figure 15, it can be seen that 50% of the companies who are under some external pressure from retailers do not currently measure their organisational footprint. The proportion is 42% for those under pressure from their supply chain partners and 43% for those coming under some pressure from users and consumers.

Whilst retailers and other major buyers of goods and services now include requirements for carbon measurement and reduction in their procurement and sourcing strategies, many of them do not currently enforce this requirement.

The above results show however, that if retailers and big buyers were to start enforcing the requirements for organisational carbon measurement, many suppliers in Ireland and Northern Ireland would currently be non-compliant.

Compliance with requirements for product carbon measurement
A similar analysis of compliance with product carbon measurement requirements showed that 71% of respondents who were coming under some external pressure to measure the GHG emissions from their products and services, do not currently do so.

As shown in Figure 16 below, these include 69% of respondents who are coming under pressure from Retailers, 70% coming under pressure from supply chain partners and 78% coming under some pressure from customers.

Figure 15: Compliance with market requirements for organisational carbon measurement
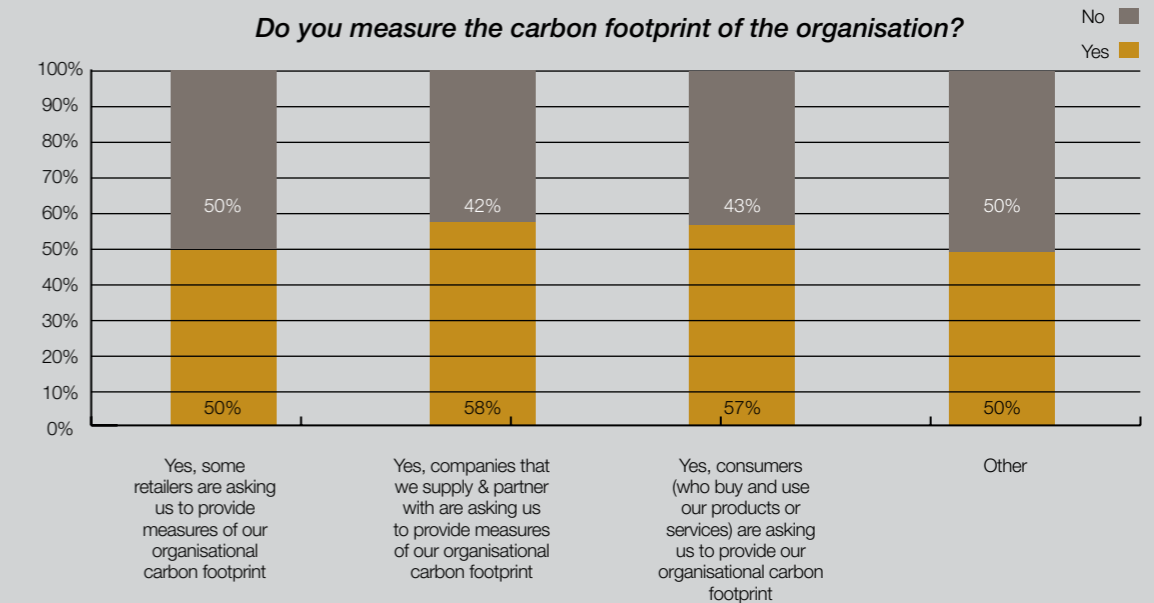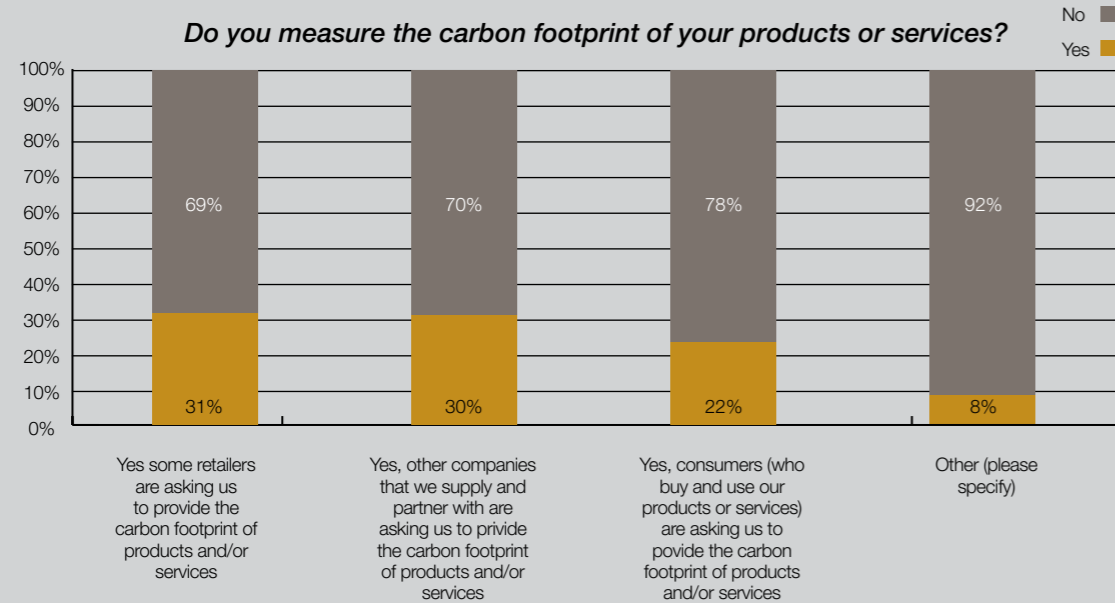
Figure 16: Compliance with market requirements for product carbon measurement

Do you measure the carbon footprint of your products or services?

Again, these results suggest that if retailers and supply chain partners were to start enforcing their requirements for product carbon metrics, many suppliers from Ireland and Northern Ireland would be at risk of non-compliance.

This is of particular concern, as some of the world's biggest retailers, including Tesco in the UK, Migros in Switzerland and Groupe Casino in France, have made varying commitments to put carbon labels on the products that they sell. This will put greater pressure on suppliers to provide product carbon metrics.

4.7 Challenges faced by respondents in measuring carbon impacts

Amongst other things, the survey also sought to assess the challenges that companies who currently measure GHG emissions, face in doing so. As with all other questions, this was asked in the context of organisational and product carbon footprinting respectively.

Organisational carbon measurement challenges
When companies who measure organisational carbon footprint were asked about the challenges they face in doing so, the highest proportion, (i.e. 34%), indicated that sourcing data represents the biggest challenge.

Organisational carbon measurement necessitates various inputs which requires, at the minimum, data relating to energy consumption, transportation and fuel use over time. These are required for calculating Scope 1 and Scope 2 emissions as per the GHG Protocol Corporate Standard, which are mandatory requirements of most carbon measurement approaches. Carbon measurement (even Scope 1 and Scope 2) requires systems and processes for collecting data in a timely manner, on a regular basis and in the right format[34]. This can present challenges to businesses, especially for smaller firms with limited resources and capacity.

As can be seen from Figure 17, a further 28% of respondents who currently measure carbon footprint listed the difficulty of finding trust-worthy guidance as a challenge.

Further analyses showed that 63% of the respondents who experienced challenges with finding trust-worthy guidance were based in Ireland, with only 25% based in Northern Ireland.

One reason for the significantly lower proportion in Northern Ireland could be that efforts have been made by Defra and the Carbon Trust to publish and communicate simplified guidance for measuring organisational carbon footprint.

In particular, Defra published its Guidance on how to measure and report your greenhouse gas emissions in 2009, which sought to provide easy-to-follow guidance for UK companies wishing to calculate their organisational footprint.

Figure 17: Challenges faced in measuring organisational carbon footprint

34 Measurement of Scope 3 emissions, which include emissions arising from waste, outsourced activities, staff travel, have even more demanding data requirements.

Recognising the unique requirements of SMEs for simplified processes and information, Defra also published a truncated version of the 69-page guidance, specifically for SMEs.

The survey responses suggest that no similar official, simplified and publicly available guidance have been published in Ireland.

Additionally, the UK based Carbon Trust has published a number of guidance for carbon management and reduction, and regularly hosts seminars and workshops around related topics in Northern Ireland. This too may account for the lower proportion of companies in Northern Ireland who indicated that finding trust worthy guidance is a challenge.

Most guidance and methodologies for carbon measurement require the application of emission factors to convert resource consumption and activity data, e.g. fuel use and miles travelled, to GHG emissions. To ensure the validity of the carbon measurement exercise, these emission factors should be derived from recognised 'official' sources and should reflect, as best as possible, the realities on the ground.

Both the UK and Irish governments seek to publish official emission factors on an annual basis. The most recent version of the official UK emission factors, i.e. for 2010, are available on Defra's website, whilst the most recent Irish emission factors (i.e. 2008) can be found on the website of the SEAI.

However, 16% of the respondents who measure carbon footprint indicated that finding official emission factors is sometimes challenging. This suggests that better publicising of the emission factors published by Defra and SEAI may be necessary in the Northern Ireland and Irish contexts respectively.

Senior management appear to be well engaged with current carbon measurement activities in Ireland and Northern Ireland. Notably, only 11% of those who currently measure their organisational carbon footprint indicated that convincing senior managers is one of the challenges they face.

A further 11% of respondents indicated that they face 'Other' challenges in measuring GHG emissions. Many of the explanatory comments from these respondents tended to point in the direction of a need for clearer and more accessible guidance. One of the issues that was highlighted, for example, is the difficulty defining the boundaries for the measurement process. Other respondents also highlighted the challenges of finding the resources and time for the assessment.

Product carbon measurement challenges
The data requirements for product carbon measurement can be significant, as emission sources over the entire product life cycle have to be accounted for.
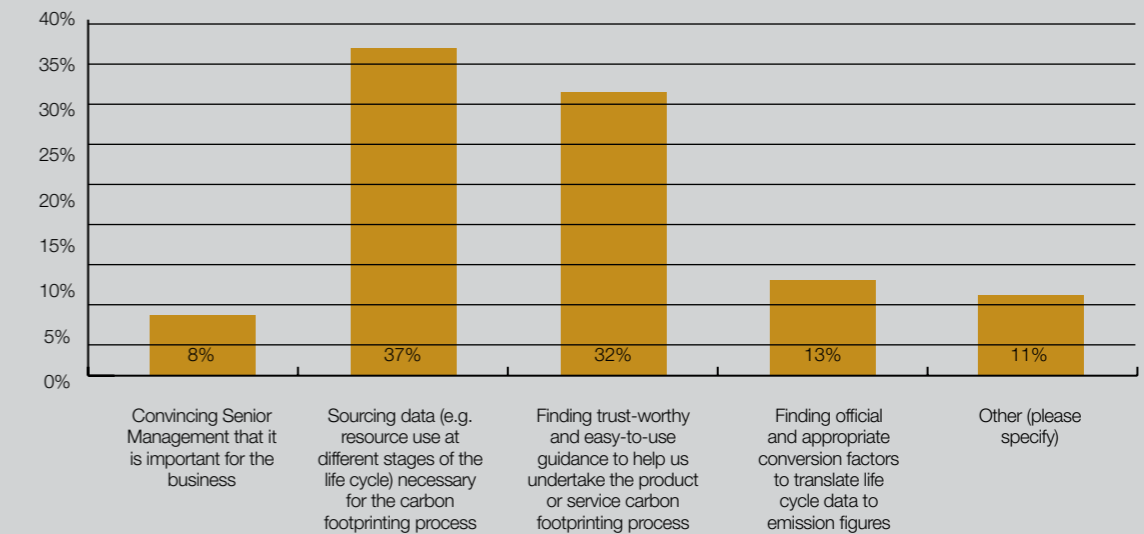
Furthermore, the methodologies for life cycle product carbon measurement are reasonably complex.

The guidance for application of the only formal methodology, PAS 2050, is essentially comprised of two publications. These comprise of the 'Specification for the assessment of the life cycle greenhouse gas emissions of goods and services', which is a 43 page document that sets out the technical requirements for assessing the life cycle GHG emissions of goods and services; and the 'Guide to PAS 2050 - How to assess the carbon footprint of goods and services', a 58 page publication that provides a 'one size fits all' high level guidance for applying PAS 2050.

It is therefore not surprising that 37% of companies currently undertaking product carbon measurement indicated that finding robust life cycle data to undertake the assessment is a key challenge; and that 32% have difficulties finding easy to use guidance for undertaking product carbon measurement.

As with organisational carbon footprinting, convincing senior management was only specified as a key challenge by a minority of respondents (i.e. 8%). This again suggests that within those companies that currently measure product carbon footprint, senior managers have been actively involved and supportive of the process.

Figure 18: Challenges faced in product carbon measurement

4.7.1 Benefits realised from carbon measurement

Carbon measurement has the potential to provide business benefits. In that regard, the study sought to ascertain whether respondents had derived any of the suggested business benefits from organisational or product carbon measurement.

Organisational carbon measurement
Of the respondents who currently measure their organisational carbon footprint, 72% indicated that they have derived one or more business benefits from doing so.
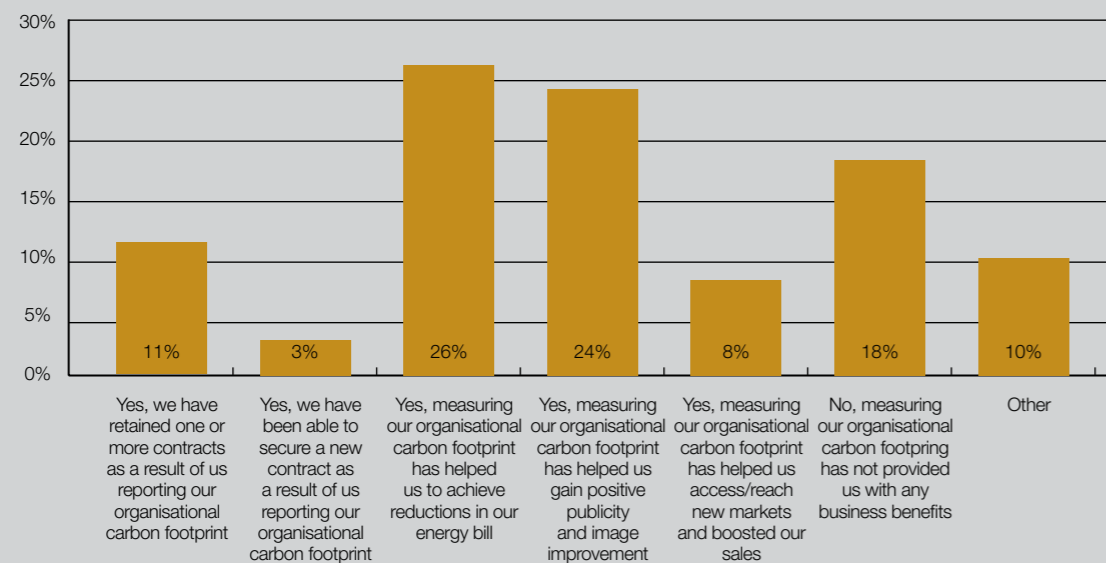
In particular, 26% indicated that measuring their carbon emissions has helped them to achieve reductions in their energy bills.

This is not surprising, as the aim of carbon measurement is typically to realise carbon reduction and management. Given the direct correlation between carbon emissions and energy consumption, any reduction in carbon emissions will be associated with reduced energy consumption and energy bills.

A further 24% of companies who currently measure organisational carbon footprint indicated that they have achieved positive publicity and improvements in image as a result. Indeed, many companies report their carbon emissions publicly or report them to their supply chain partners, which can help with stakeholders' perceptions of the company.

Figure 19 also shows that 11% of respondents indicated that carbon measurement has helped them to retain one or more contracts.

Figure 19: Benefits that have been achieved from organisational carbon measurement

As previously discussed, there is market pressure from some retailers, large businesses and public sector buyers for suppliers to provide carbon information as part of the due diligence and prequalification questionnaires. Companies that are able to provide this information may therefore be viewed favourably by buyers when negotiating new contracts and agreements.

10% of respondents indicated 'Other' benefits that they have derived from organisational carbon measurement. Many of these made references to internal benefits, including positive message for the workforce, improved business practices, and identification of carbon hot spots.

Product carbon measurement
In total, 80% of the companies that currently measure the carbon footprint of products and services indicated that they have consequently derived one or more business benefits.

Notably, 31% of respondents indicated that product carbon measurement has resulted in reductions in their energy bills.

As previously discussed, this is likely to be due the fact that carbon information is a useful indicator of energy efficiency. Therefore, where companies are measuring emissions with a view to reducing them, an associated reduction in energy consumption and costs will be simultaneously achieved.

A further 26% indicated that it has resulted in positive improvements to brand and image, whilst for 14% product carbon measurement had helped the companies retain one or more contracts.

Figure 20: Benefits that have been achieved from product carbon measurement

4.8 Reasons for not measuring

As has been shown, the majority of respondents to the survey do not currently undertake carbon measurement of any kind. Specifically, 68% do not currently measure organisational carbon footprint, whilst 87% do not currently measure product carbon footprint.

In order to understand the reason for this, respondents who did not measure their carbon impacts were asked why they did not do so.

Organisational carbon measurement
As shown in Figure 21 below, 28% of the respondents who do not measure organisational carbon footprint indicated that this is because they do not currently view organisational carbon measurement as important to their business.
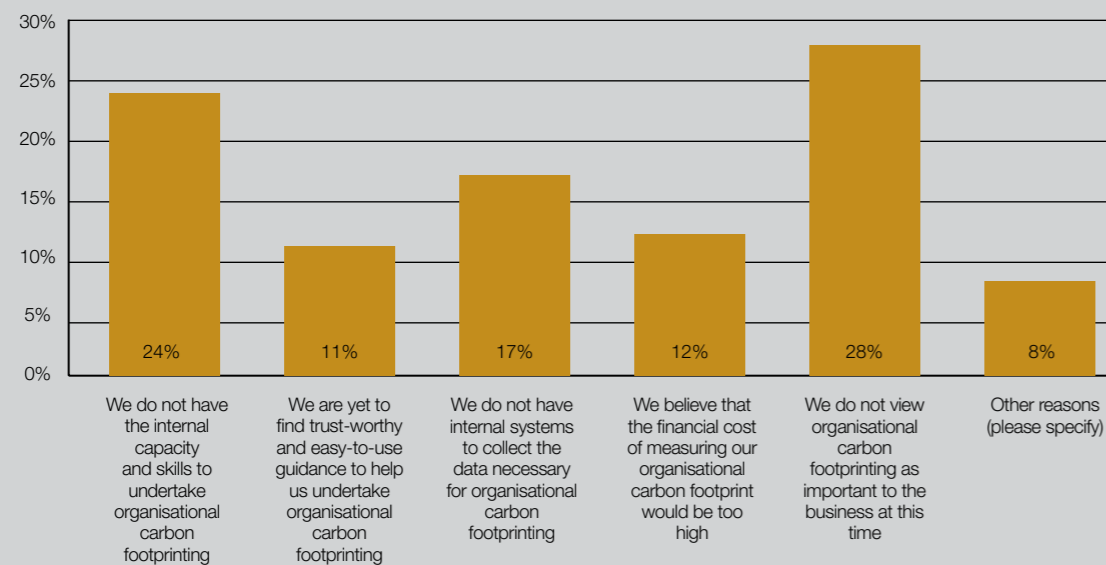
Further analysis showed a strong correlation between these respondents who do not view organisational carbon measurement

as important, and those respondents who previously indicated that they are currently not experiencing any market pressure to provide organisational carbon footprint.

Specifically, the respondents who stated that they do not measure organisational carbon footprint because they do not currently view it as important to their business, accounted for 95% of those respondents who previously indicated that they are not feeling any external pressure to measure their organisational carbon footprint.

The fact that a large proportion of businesses do not measure their carbon footprint because they are not currently being asked for it, may mean that they are not in turn deriving the other business and competitive advantages that carbon measurement can provide. These include for example, reduced energy bills, market differentiation and other internal benefits.

Figure 21: Reasons why respondents do not measure organisational carbon footprint

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Elliott's Tradition
(County Armagh, Northern Ireland)

Elliott's Tradition is a small family-owned and family-run food production and supply company, that specialises in supplying a range of sausages to local catering firms.

The company was formed in September 1990 by the Elliott Family who have been involved in the food business for many years, with a retail butchery based in Banbridge.

Elliott's Tradition employs about 20 people in the factory, i.e., on the production side. There is no dedicated Energy Manager, and these activities tend to be picked up by the Owner/Director, with help by two support staff.

As many of Elliott's Traditions customers are small and local, there has not been any pressure to measure and report carbon footprint.

The company is interested however, in measuring, tracking and reporting its carbon footprint. This is driven both by the company's recognition of the efficiencies and reduced operating costs that can be derived, and their view that regulatory trends in the UK may soon necessitate carbon measurement.

Thus far however, the company have not been able to comprehensively measure their carbon footprint, due to the lack of internal resource, expertise and capacity to do so.

"Although we are not under any external pressure to measure or report our carbon footprint, we would be keen to do so. As a small company however, we simply do not have the resources and skills on hand."

Jeff Elliott, Director (Elliott's Tradition)

A further 24% of those who do not measure organisational carbon footprint indicated that they do not have the internal skills and resources to do so.

In theory and with the right guidance, organisational carbon measurement is not overly complex. However, where no guidance exists, it can pose challenges especially for smaller organisations. Furthermore, the absence of simple guidance may add to the perception that it is a complex process, when that is not necessarily the case.

17% of respondents who do not currently measure organisational carbon footprint stated that this is because they have no internal systems to collect the data whilst 11% highlighted the fact that they are yet to find simple, trust-worthy and easy to use guidance.

Interestingly, 12% indicated that the financial cost of measuring organisational carbon footprint would be too high. Whilst this may potentially be the case, especially for smaller firms without adequate guidance, this response is more likely to driven by misperceptions of the effort required for organisational carbon measurement.

Product carbon measurement
The reasons that respondents provided (see Figure 22) for not measuring the carbon footprint of products, were similar to those provided for not measuring organisational carbon footprint.

25% indicated that that they did not view product carbon footprinting as important to the business.

Again, this was strongly correlated with previous responses around external market pressure for carbon measurement. Indeed, those respondents who indicated that product carbon measurement is not of current importance to their business, accounted for 92% of those respondents who had previously stated that they are not under any market pressure to provide product carbon metrics.

A further 24% of respondents who do not currently measure product carbon footprint indicated that they do not do so because they do not have the relevant capacity and skills.

As previously indicated, derivation of product carbon footprint requires the identification and integration of GHG emissions across the life cycle of the product. The application of life cycle based techniques for this purpose can provide challenges to most companies, especially where there are significant geographical and time lags between the different stages of the life cycle.
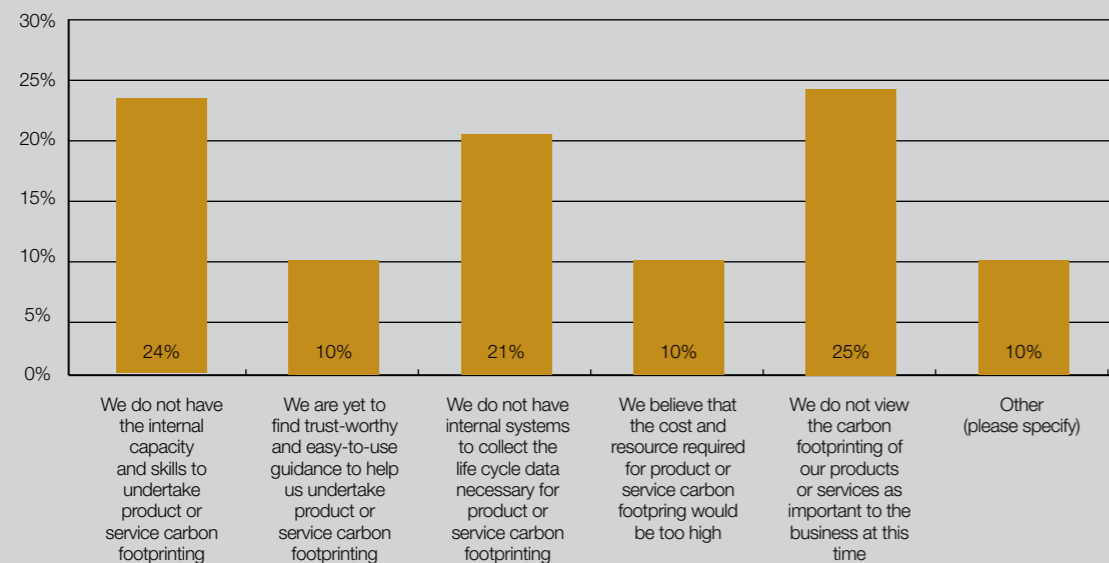
This challenge is further exacerbated by the current unavailability of sector specific guidance for product carbon measurement. This associated difficulty was highlighted by 10% of respondents indicated as a key barrier to product carbon measurement.

In addition to the methodological challenges, there is also the difficulty of obtaining the life cycle data required for calculation of the product carbon footprint. 21% of respondents who currently do not measure product carbon footprint indicated that this is a key reason for not measuring product GHG emissions.

Amongst the 10% of respondents who completed the 'Other' text field , were a number of companies that provided services, who indicated that because they provide 'services', product carbon measurement is therefore irrelevant to them.

This reflects some obvious confusion and poor awareness of the principles of product carbon footprinting methodologies, and in particular, the fact that they are also applicable to services as well as physical products.

Figure 22: Reasons for not measuring product carbon footprint

	We do not have the internal capacity and skills to undertake product or service carbon footprinting	We are yet to find trust-worthy and easy-to-use guidance to help us undertake product or service carbon footprinting	We do not have internal systems to collect the life cycle data necessary for product or service carbon footprinting	We believe that the cost and resource required for product or service carbon footpring would be too high	We do not view the carbon footprinting of our products or services as important to the business at this time	Other (please specify)
	24%	10%	21%	10%	25%	10%

**Greiner Packaging Ltd.
(Co. Tyrone, Northern Ireland)**

Staffed by 185 employees, Greiner Packaging (NI) produces and supplies a range of packaging products to the food and drink sector.

The company is part of the wider Greiner Packaging Group, which with a workforce of 2,584 employees at 21 production sites throughout Europe, is one of the largest European packaging companies.

Greiner Packaging (NI) is a participant in the CRC Energy Efficiency Scheme, the UK's mandatory emissions trading scheme. They have also entered into a Climate Change Agreement (CCA) with the UK Government, which enables them to achieve discounts on the Climate Change Levy, providing they meet targets for carbon reduction.

As part of its participation in these schemes, the company has been measuring its organisational carbon footprint. Furthermore, Greiner Packaging has also been investing in a range of carbon reduction schemes.

Having made these investments and recognising the increasing market need, the company is keen to communicate the low carbon attributes of its products to customers.

The company has been unable to do this to date, due to the challenges in sourcing the life cycle data required.

"We have invested heavily in initiatives to reduce our GHG emissions, and are keen to communicate our progress to stakeholders. We have been able to do so by measuring our organisational carbon footprint. The difficulty of sourcing life-cycle emissions data for all our inputs however, has prevented us from measuring product carbon footprint to date."

**Jarek Zasadzinski
CEO, Greiner Packaging Ltd)**

4.9 Respondents views on improving carbon measurement uptake

In line with the objectives of the study, respondents' views were sought on what would reduce the challenges and barriers to carbon measurement.

In particular, respondents were asked about improvements that would increase the likelihood that they would to continue to measure their carbon emissions (if they already do so), or start to measure their carbon emissions (if they do not currently do so).

Organisational carbon measurement
As shown in Figure 23 below, 30% of all respondents indicated that accessible and easy-to-use guidance would reduce the challenges and barriers to organisational carbon measurement.
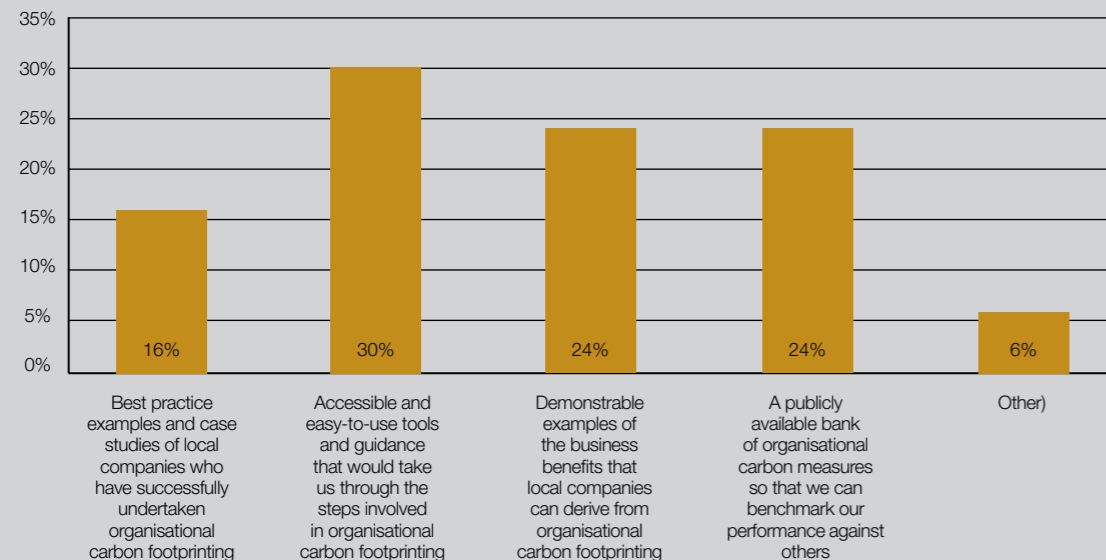
This aligns with the importance attributed to trust worthy guidance in previous questions.

A further 24% indicated that demonstrable application and examples of benefits that can be derived by local companies, would encourage them to adopt carbon measurement.

A similar proportion (i.e. 24%) of all respondents, would undertake organisational carbon measurement if they had access to a publicly available bank of carbon metrics and data that would enable benchmarking.

16% of respondents indicated that they would be encouraged to measure organisational carbon footprint if best practice examples and case studies existed from local companies who had derived benefits from organisational carbon measurement. Amongst other things, best practice examples would provide lessons from which companies would learn, but may also be provide guidance in terms of tools.

Figure 23: Views on how rates of organisational carbon measurement could be increased

Of the 6% who listed "Other" potential drivers that would make them more inclined to measure organisational carbon footprint, many referred to customer demand and requirements, i.e. if customers asked for it. Others also referred to a legal obligation to measure or report carbon footprint.

Product carbon measurement
When product carbon measurement is considered, 25% of respondents indicated that they would be more likely to measure their footprint if accessible and easy-to-use guidance existed that could help them that could take them through the process of measuring life cycle product GHG emissions.
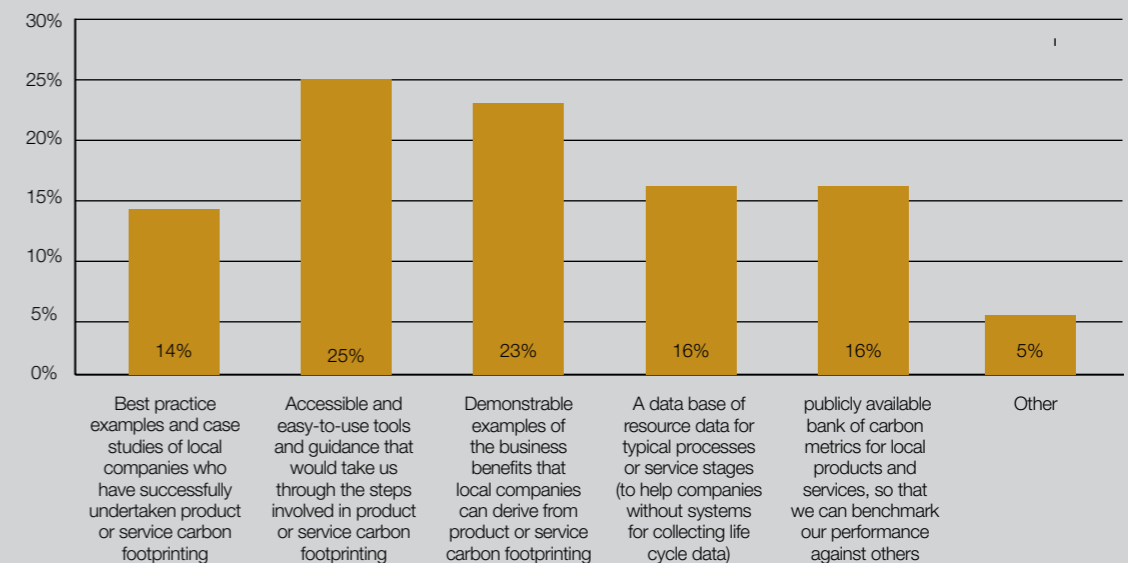
A similar proportion (i.e. 23%), stated that demonstrable examples of the benefits that local companies can derive from product carbon measurement would make them more likely to measure their impacts.

Furthermore, 16% indicated that would be more inclidned to measure product carbon footprint if a data base of typical life cycle data exist, and a further 16% highlighted a publicly available bank of product carbon information so that they can benchmark performance against other products.

A similar proportion (i.e. 14%), indicated that best practice examples of successful applications of product carbon measurement methods would make them likely to measure their product carbon footprint.

The 5% who listed 'Other' potential drivers that would make them more inclined to measure product carbon footprint, again made references to customer demand and requirements, i.e. if customers asked for it. Others also referred to a legal obligation to measure or report carbon footprint.

Figure 24: Views on how rates of priduct carbon measurement could be increased

4.10 Comparative assessment of headline trends by sector

This section compares the headline trends and responses by sector with a view to assessing which sectors are most active in carbon measurement, which are most under external pressure to measure their carbon impacts etc.

For the purposes of simplification, the sectors were split into four high-level categories, Manufacturing, Agri-Food, Services and Construction. This classification system was thought to be broad enough to capture most companies in Northern Ireland and Ireland, and also reflected the companies most likely to be impacted by carbon measurement.
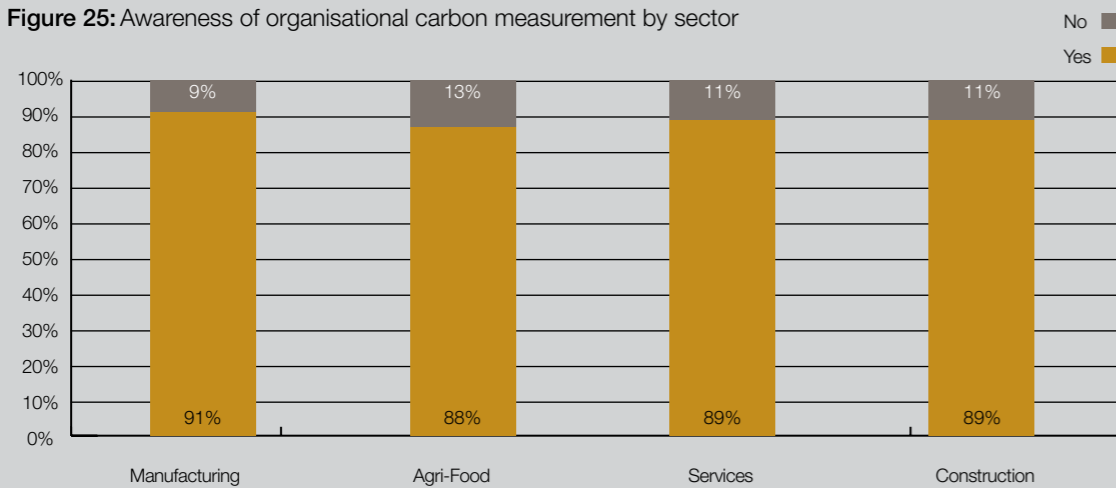
Awareness of organisational carbon measurement by sector

Figure 25 shows that awareness was reasonably well spread out across the four sectors.

It was marginally higher in the Manufacturing sector, where 91% of respondents were aware that some companies now undertake organisational carbon measurement. At the other end, only 88% of respondents from the Agri-Food sector were aware.

With only a 3% range in difference however, there is not much variation in awareness amongst the sectors.

Figure 25: Awareness of organisational carbon measurement by sector

Awareness of product carbon measurement by sector

Compared with awareness of organisational carbon measurement, there was greater variation of awareness of product carbon measurement. Indeed, there was a difference of 15% between awareness in the Agri-Food sector – where awareness was highest at 93%, and in the Services sector - where awareness was lowest at 75%.
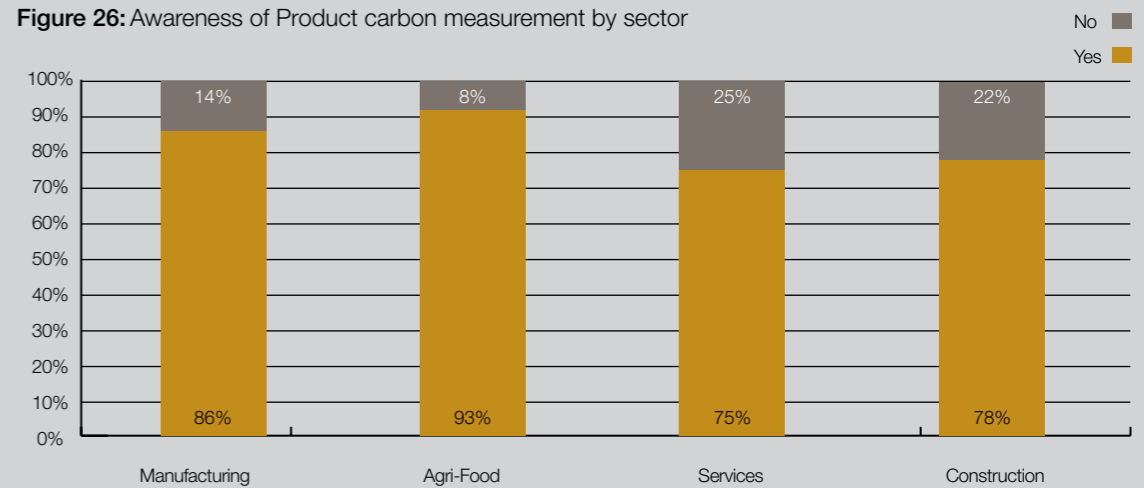
As mentioned previously, retailers have been particularly interested in product carbon measurement as a means of facilitating product carbon labelling. Many Agri-Food companies would directly or indirectly supply some of these retailers, and as such, may therefore be aware of the practice and application of product carbon measurement.

Organisational carbon measurement by sector

Only a minority of companies in each of the four sectors measured their organisational carbon footprint. The highest rate of measurement was in the Services sector, where 46% of respondents measured organisational carbon footprint.

The lowest level of carbon footprinting was amongst Agri-Food companies, where only 28% of respondent measured organisational carbon footprint.

Figure 26: Awareness of Product carbon measurement by sector

Product carbon measurement by sector

As per previously discussed results, only a few respondents in the overall sample currently measure the carbon footprint of their products. This was also reflected at sector level.

Notably, the Agri-Food sector had the highest rate of product carbon measurement with 13%. This was followed by the Services sector with 12%, the construction sector with 10% and manufacturing with 5%.

Market pressure for organisational carbon measurement by sector

As can be seen in Figure 29 below, the trends in market pressure for organisational carbon measurement varied significantly across the sectors.

Whilst for example, the majority of respondents in the Manufacturing, Agri-Food and Services sectors indicated that they are not coming under any market pressure to measure organisational carbon footprint, the majority of respondents from Construction sector indicated that they are.

Figure 27: Organisational carbon measurement by sector

Figure 28: Product carbon measurement by sector

Figure 29: Market pressure for organisational carbon measurement by sector

Notably, 56% of respondents from the Construction sector indicated that they are coming under pressure from supply chain partners and consumers, to measure their organisational carbon footprint, whereas only 22% indicated that they are coming under no pressure at all.

Market pressure for product carbon measurement footprint

A high proportion of respondents in all four sectors indicated that they are not currently under any market pressure to undertake product carbon measurement.

Figure 30: Market pressure for Product carbon measurement by sector

Some respondents indicated that they are under some pressure however. This included 33% of respondents from the Manufacturing sector and Construction sectors, and 30% of respondents from the Agri-food sector.

In the Manufacturing and Construction sectors, the external market pressure was mainly driven by supply chain partners and business customers. 21% of Manufacturing companies and 33% of Construction companies indicated that they are coming under some pressure from supply chain partners.

In the Agri-food sector, Retailers accounted for the highest level of external market pressure. 16% of respondents from the Agri-food sector indicated that they are coming under some pressure from retailers.

4.11 Comparative analysis of headline trends by region

This section compares the headline trends by the region where the participating company operates, i.e. Ireland, Northern Ireland or on a cross border basis.

Awareness of organisational carbon measurement

Awareness of organisational carbon footprinting was highest amongst those companies who operate on a cross-border basis. Notably, all respondents in this category indicated that they are aware that some businesses do measure organisational carbon footprint.

Figure 31: Awareness of organisation carbon measurement by region of operation
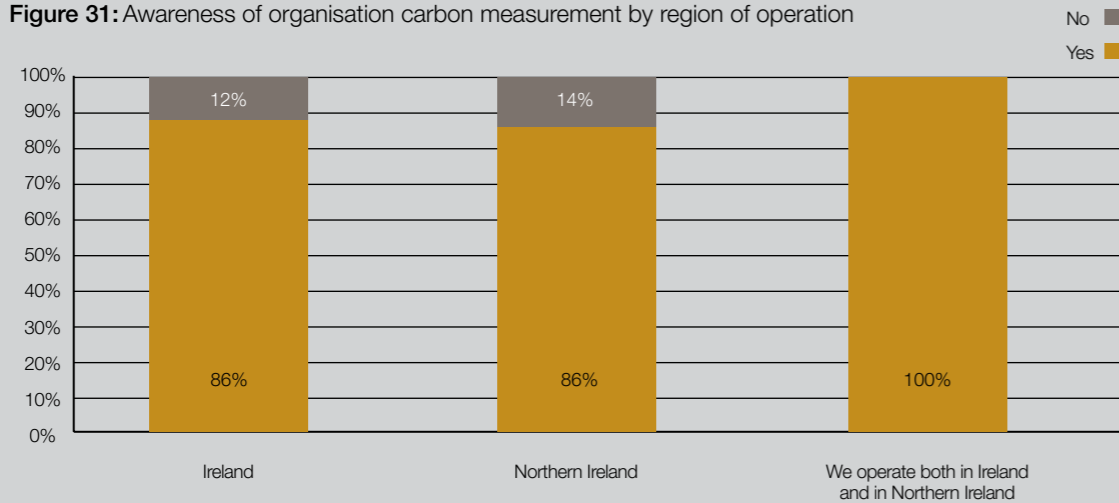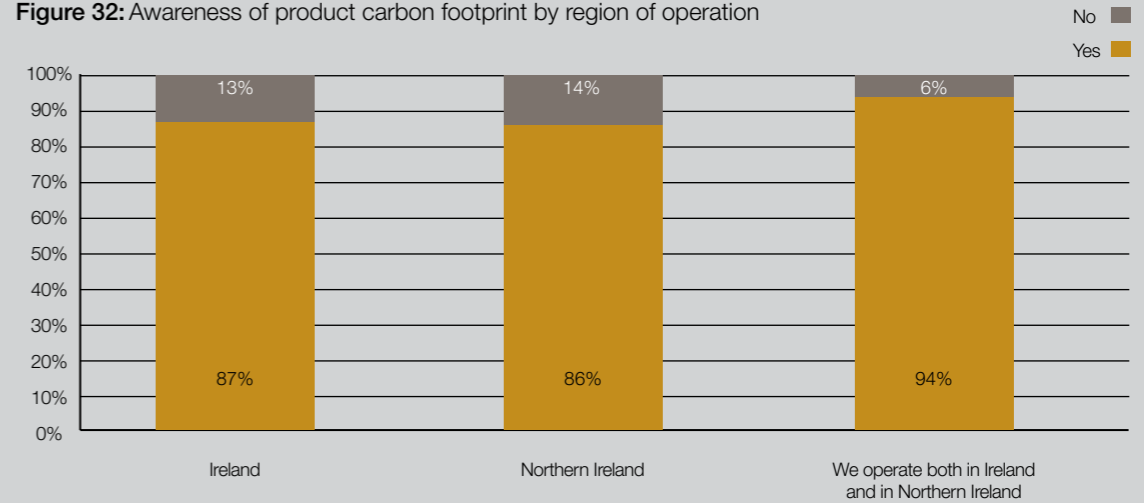
No ■
Yes ■

Ireland — 86%, 12%
Northern Ireland — 86%, 14%
We operate both in Ireland and in Northern Ireland — 100%

Figure 32: Awareness of product carbon footprint by region of operation

No ■
Yes ■

Ireland — 87%, 13%
Northern Ireland — 86%, 14%
We operate both in Ireland and in Northern Ireland — 94%, 6%

Notably, there was not much variance in the awareness of those respondents who operate solely in Ireland or Northern Ireland, with awareness levels of 88% and 86% respectively.

Awareness of product carbon measurement At 94%, those respondents who operated on a cross-border basis again demonstrated greatest awareness of product carbon measurement.

As with organisational carbon measurement, there no significant difference in the rate of awareness between companies who operate in Ireland and those who operate in Northern Ireland.

As illustrated below, 87% of respondents from Ireland indicated that they are aware of the practice and application of product carbon measurement, whilst an almost

identical proportion, 86% of companies from Northern Ireland indicated similar awareness.

Current levels of organisational carbon measurement amongst respondents

The survey results showed that respondents who operate on a cross-border basis are more likely to measure their organisational carbon footprint. At 47%, almost half of respondents in this category of companies currently undertake organisational carbon measurement.

This was higher than current level of measurement amongst companies who operate solely in Ireland, of whom only 35% currently measure organisational carbon footprint. It was also higher than measurement rates in Northern Ireland, where only 25% of respondents currently measure organisational carbon footprint.

Figure 33: Organisational carbon measurement by region of operation

No ▢
Yes ▢

Product Carbon measurement

At 13%, Ireland had a higher proportion of respondents who stated that they currently measure the product carbon footprint of products and services. Measurement rates amongst respondents who operate on a cross-border basis was slightly less, at 12%; whilst 7% of respondents from Northern Ireland indicated that they currently measure product carbon footprint.

Market pressure for organisational carbon measurement

Of the three groupings, companies who operate on a cross-border basis were more likely to perceive themselves as being under market pressure to measure organisational carbon footprint. Indeed, 44% of these companies indicated that they are facing pressure from retailers, supply chain partners and customers to measure and report the carbon footprint of the organisation.

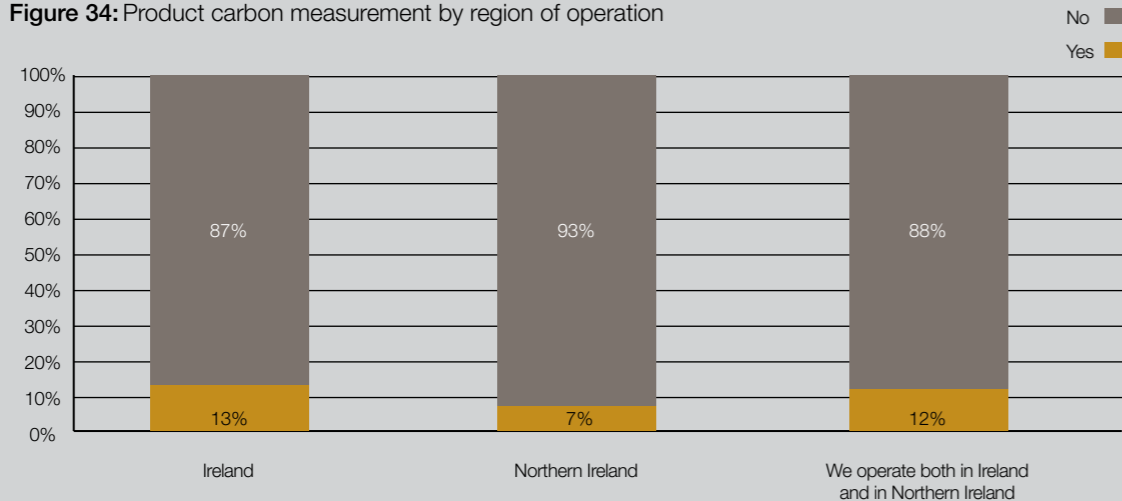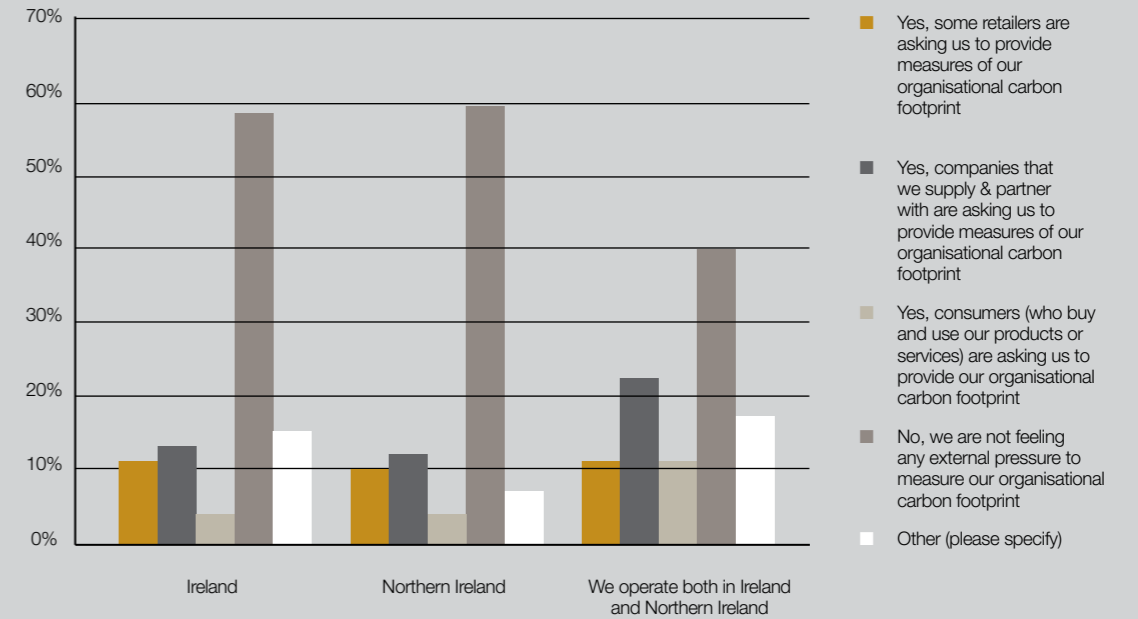**Figure 34:** Product carbon measurement by region of operation

No ▢
Yes ▢

Figure 35: Market pressure for organisational carbon measurement

- Yes, some retailers are asking us to provide measures of our organisational carbon footprint
- Yes, companies that we supply & partner with are asking us to provide measures of our organisational carbon footprint
- Yes, consumers (who buy and use our products or services) are asking us to provide our organisational carbon footprint
- No, we are not feeling any external pressure to measure our organisational carbon footprint
- Other (please specify)

Market pressure for Product carbon measurement

39% of respondents who operate on a cross-border basis perceive themselves to be under some form of market pressure to provide the carbon footprint of products and services. This represented the highest level of market pressure amongst the three groupings.

At 34%, just over a third of respondents from Northern Ireland perceived themselves to be coming under market pressure for product carbon measurement, whilst 25% of respondents who operate in Ireland indicated likewise.

In Ireland, product carbon footprinting appears to be driven primarily by retailers, from whom 13% of respondents indicated that they are feeling some pressure. There was also a reasonable level of pressure from supply chain partners, from whom 11% of respondents operating in Ireland indicated they were feeling some pressure.

Supply chain partners were consistently highlighted as sources of pressure for product carbon footprinting. In Northern Ireland, 21% of respondents indicated that they were under pressure from supply chain partners, whereas the proportion was 22% for respondents who operate both in Ireland and Northern Ireland.

Figure 36: Market pressure for Product Carbon Measurement

- Yes, some retailers are asking us to provide the carbon footprint of products and/or services

- Yes, other companies that we supply and partner with are asking us to provide the carbon footprint of products and/or services

- Yes, consumers (who buy and use our products or services) are asking us to provide the carbon footprint of products and/or services

- No, we are not feeling any external pressure to measure the carbon footprint of our products and/or services

- Other (please specify)

4.12 Comparison of headline trends by company sizes

It is likely that businesses' ability to respond to carbon measurement requirements may be determined by their size. This section therefore compares some of the high level trends and responses by company size.

To guide this process, companies were classified into four groups in accordance with the European Commission's definition[35] of micro, small and medium-sized enterprise, which classifies companies as follows.

Type of enterprise	Headcount
Large	Greater than 250
Medium	50 to 249 employees
Small	10 to 49 employees
Micro	Less than 10 employees

As per the European Commission's guidance, Micro, Small and Medium sized enterprises are collectively referred to as Small and Medium Sized Enterprises (SMEs).

35 See EC 'Recommendation 2003/361/EC: SME Definition' which was formally adopted on 1st January 2005.

Awareness of organisational carbon measurement

The results show that there is a strong correlation in companies' awareness of organisational carbon measurement and their sizes. This is illustrated in Figure 37 below which shows the lowest level of awareness amongst Micro-enterprises at only 75%, compared to 82% for smaller companies, 97% for medium-sized companies and 100% awareness amongst large firms.

4.12.1 The Awareness of product carbon measurement

The correlation between awareness and company size was similarly evident in awareness of product carbon measurement.

Again, the lowest level of awareness was amongst Micro-enterprises at 75%; improving progressively to 79% for small firms, 95% for medium-sized companies and 97% for large businesses.

4.12.2 Current levels of organisational carbon measurement amongst respondents

Continuing the trends above, there was also a clear correlation between organisational carbon measurement activities and company size.

As shown below, the rate of organisational carbon measurement is lowest amongst micro-enterprises at only 4%, gradually increasing to 57% amongst large firms.

Figure 37: Awareness of organisational carbon measurement by company size

No
Yes

Figure 38: Awareness of product carbon measurement by company size

Figure 39: Organisational carbon measurement by company size

4.12.3 Product carbon measurement amongst respondents
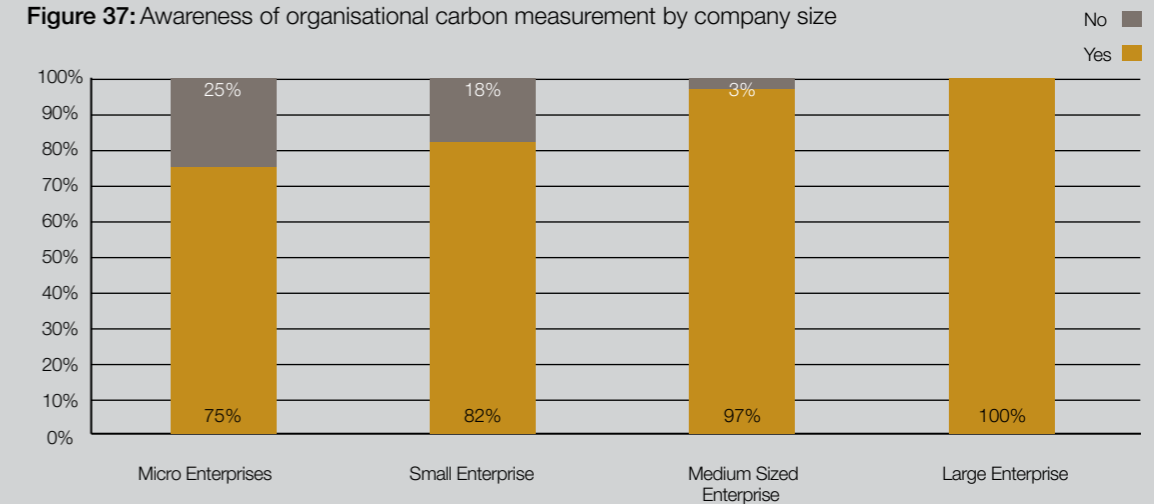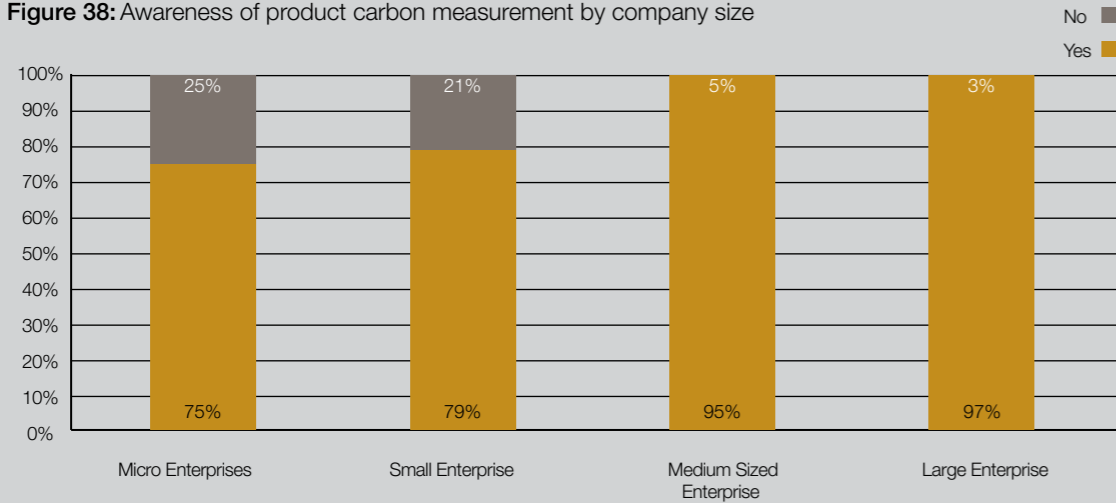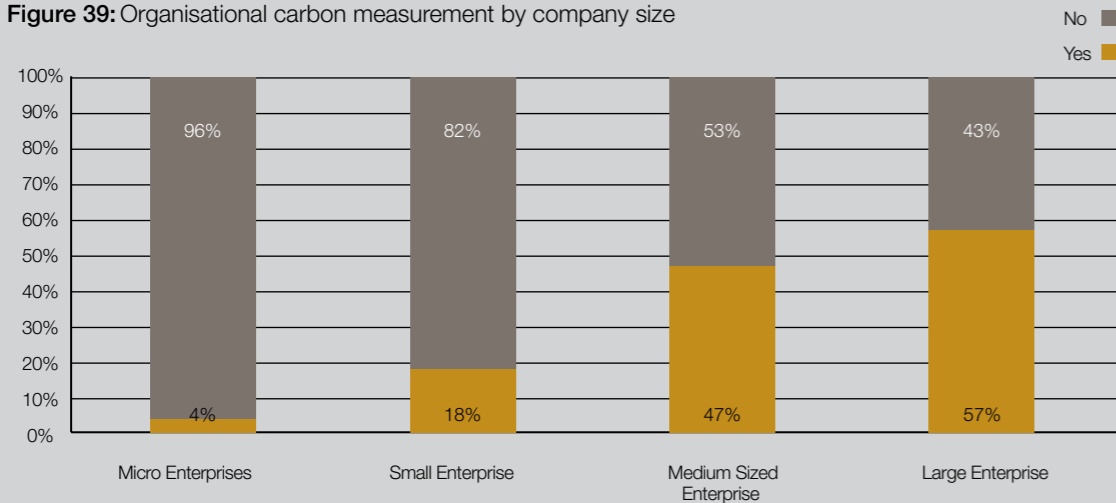
The survey showed that none of the micro-enterprises currently measure carbon footprint of their products and services. As with previous responses, the highest rate of product carbon measurement was amongst large firms at 17%, followed by medium-sized enterprises at 13%.

4.12.4 Market pressure for organisational carbon footprinting

Large firms are more likely to perceive themselves as facing some market pressure to measure the carbon footprint of the organisation. 47% of respondents in this category indicated that they are under pressure from retailers, supply chain partners and customers to do so.

Figure 40: Product carbon measurement by company size

Figure 41: Market pressure for organisational carbon measurement

Amongst medium-sized enterprises, 26% indicated they are facing a push from the market to measure their organisational carbon footprint, which was slightly lower than the 30% of small firms that indicated likewise.

Notably, 23% of micro-enterprises also indicated that they are facing some sort of pressure.

In all categories of companies, the greatest pressure for organisational carbon measurement was from supply chain partners. Indeed, the latter were highlighted by 24% of large firms as sources of pressure. Similar responses were received from 13% of medium-sized enterprises, 10% of small firms and 19% of micro-enterprises.

4.12.5 Market Pressure for product carbon measurement

Respondents' perception of market pressure also increased progressively with company sizes. Only 12% of micro-enterprises for example, perceived themselves to be under some market pressure to measure product carbon footprint. Amongst small firms, the proportion increased to 27%, whilst amongst medium-sized and large businesses, the related proportion were 29% and 45% respectively.

As with organisational carbon measurement, the greatest push for product carbon measurement appears to be coming from supply chain partners. They were identified as the main source of market pressure by 8% of micro-enterprises, 10% of small f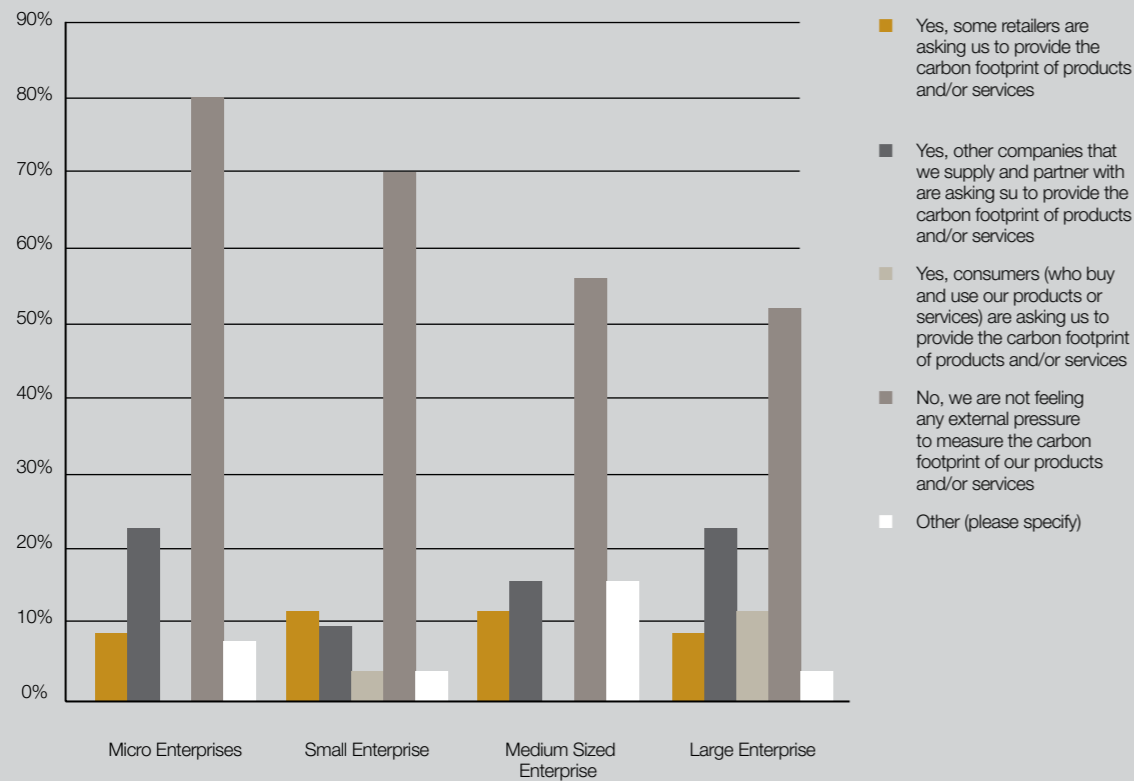irms, 16% of medium-sized businesses and 24% of large enterprises. This reflected the single highest source of market pressure for most categories of companies. The exception were small firms, where at 13%, retailers were identified as providing the greatest push for product carbon measurement.

Figure 42: Market pressure for Product carbon Measurement

5.1 Introduction

Many businesses in Ireland and Northern Ireland are facing direct market demand to measure their organisational carbon footprint. Larger businesses are responding to these market requirements, but smaller companies have more difficulties in doing so.

There is similar pressure on businesses to measure and report the carbon footprint of products and services. In this case however, companies of all sizes and from all sectors are failing to respond to these market requirements, with only a very small number of companies in Ireland and Northern Ireland currently undertaking product carbon measurement.

These results suggest that smaller companies especially could benefit from easy-to-use guidance, accessible tools and support to facilitate organisational carbon measurement. Furthermore, all companies could benefit from an improved understanding of product carbon measurement, combined with accessible guidance, tools to help them source the requisite data and undertake the requisite analysis.

The main findings of the study are summarised in the sub-sections below.

5.2 Business in Ireland and Northern Ireland

Businesses know of carbon measurement but not necessarily how it is undertaken in practice. The vast majority of businesses that participated in this study are aware that companies globally now measure the GHG impacts both of the organisation and of their products.

Notably, 91% of respondents indicated that they are aware that businesses now measure GHG impacts at the organisational level. A similar proportion (i.e. 90%), indicated that they are aware that companies now measure the carbon footprint of products and services.

Further analyses showed however, that whilst participants are aware of product carbon measurement, many are unclear as to how it is undertaken in practice.

In particular, a significant proportion of respondents who indicated that they currently measure product carbon footprint, had wrongly taken this view based on the fact that they currently measure emissions arising from on-site production processes. In subsequent engagement, it became clear that these respondents were unaware that product carbon measurement is based on emissions over the life cycle of the product.

5.3 Organisational carbon measurement presents unique challenges and barriers to smaller enterprises

There are gaps in organisational carbon measurement in all sectors and company sizes. However, these gaps are more evident amongst small and micro-enterprises.

32% of all companies that participated in the study indicated that they currently measure the carbon footprint of their organisations. This is comprised mainly of medium-sized and large enterprises, who accounted for 85% of these respondents. Only 15% of the organisations who currently measure their organisational carbon footprint were small firms and micro-enterprises.

The results also showed that smaller companies are less likely to use, or be familiar with, formal approaches for corporate carbon measurement. Notably, 36% of all respondents who measure their organisational carbon footprint use the GHG Protocol Corporate Standard to do so. Further analyses showed that all the companies using the GHG Protocol were medium sized of large organisations. No participating micro or small enterprise used the GHG Protocol, which is the best known framework for organisational carbon measurement.

On the other hand, small firms and micro-enterprises are more likely to measure organisational carbon footprint without drawing on any formal framework or guidance. Notably, 22% of the small firms and micro-enterprises who indicated that they measure their organisational carbon footprint, do not use any formal approach.

This raises fundamental questions about the robustness of the measurement process and the credibility that stakeholders would lend to its outcomes.

The key challenges and barriers to carbon measurement faced by businesses are as follows.

- *Inadequate internal capacity and skills to undertake organisational carbon footprinting*

  26% of all businesses who do not measure their organisational carbon footprint attributed this to a lack of internal capacity and skills. Amongst small and micro-enterprises the proportion facing this challenge was higher, with 31% indicating that this is a key challenge.

- *Difficulty in finding trust-worthy and easy-to-use guidance*

  12% of those businesses who do not measure their organisational carbon footprint indicated that this is due to the unavailability of guidance.

Amongst small and micro-enterprises, the proportion was 9%, compared to 15% amongst medium-sized and large enterprises.

- *Lack of internal systems to collect the requisite data*

  18% of those businesses who do not measure their organisational carbon footprint indicated that this was due to a lack of systems to collect the requisite data. This was a particular issue for small and micro-enterprises, of whom 20% pointed to this as a barrier, compared to 15% of medium-sized and large enterprises.

- *The high financial costs of organisational carbon measurement*

  Notably, 11% of businesses who do not measure organisational carbon footprint were of the view that the costs would be too high. There was no difference in perception amongst smaller or larger organisations. 11% of small and micro-enterprises who currently do not measure organisational carbon footprint took this view; as did 11% of medium and large enterprises who do not currently measure their organisational carbon footprint.

5.4 Product carbon measurement presents challenges to the wide cross-section of companies

Unlike organisational carbon measurement, there are significant gaps in product carbon measurement activity amongst all sectors and company sizes.

Initially, 13% of the participants in this study indicated that they measure the carbon footprint of products and services.

Of those, 12% stated that they use no formal methods at all to measure their product carbon footprint. Furthermore, a significant proportion, i.e. 48%, indicated that they use 'other' approaches. Notably, none of these 'other' approaches were recognised as being published or formal approaches to product carbon measurement.

Given the complexity of product carbon footprinting and importance of robustness subsequent comparison of products, the lack of a robust underpinning methodology is a serious shortcoming.

In follow-up engagement, many of these respondents indicated that they had responded positively to the question about product carbon footprinting, because they measure the emissions arising from their on-site production process. In fact, none of the respondents who either use no formal methods or who used 'other' methods, had taken a life cycle view of the emissions.

Indeed, only 12% of companies who indicated that they measure the carbon footprint of products and services stated that they use a robust methodology, i.e. PAS 2050 – which is the only publicly available methodology for product carbon measurement at this time.

There were differences in the responses highlighted by smaller and larger organisations, particularly around their internal capacity and skills. However, as the rate of product carbon measurement is relatively low amongst all respondents, it is clear that all the challenges need to be addressed[36].

The key challenges and barriers are as follows.

- *Inadequate internal capacity and skills to undertake product carbon footprinting*

  24% of businesses who do not currently measure product carbon footprint indicated that inadequate capacity and skills is a key barrier. Amongst medium and large companies the proportion was 19%; whilst amongst small and micro-enterprises the proportion was 30%.

- *No access to trust-worthy and easy-to-use guidance*

  10% of businesses who do not currently measure product carbon footprint indicated that an issue is the lack of trust-worthy and easy to use

guidance. In light of the complexity of product carbon measurement and the need to consider life cycle emissions, there is likely to be a greater need for guidance. The relatively low percentage who indicated such a need may be due to customers underestimating the complexity of product carbon measurement – arising from the lack of awareness that life cycle emissions need to be considered.

- *Inadequate systems for collecting life cycle data*

  22% of respondents who do not measure product carbon footprint attributed this to a lack of systems for collecting life cycle data. There were no clear differences arising from the size of companies. 22% of small and micro-enterprises took this view, as did 22% of medium-sized and large enterprises.

- *The cost and resource for product carbon measurement would be too high*

  Only 10% of respondents who do not measure product carbon footprint took this view. Amongst micro-enterprises and small firms, the proportion was 8%. Again, this is likely to be associated with poor awareness of the life cycle dimension to product carbon measurement and the associated complexity arising as a result.

36 The approach differs to that for Organisational Carbon Measurement where there was a clear gap amongst Small and Micro enterprises, thus necessitating special attention to these companies.

5.5 Some businesses in Ireland and Northern Ireland are at risk of failing to meet supply chain requirement for carbon metrics

More than a third of participants in this study (i.e. 36%) indicated that they are coming under some market pressure, i.e., from retailers, supply chain partners or customers, to measure and report their organisational carbon footprint.

Further analysis showed, however, that 45% of these respondents who indicated that they are facing some market pressure to measure organisational carbon footprinting, do not currently measure their organisational carbon footprint.

This poses obvious risks. In particular, if retailers and big buyers were to start enforcing the requirements for organisational carbon measurement, many suppliers in Ireland and Northern Ireland would currently be non-compliant.

The risks to businesses in Ireland and Northern Ireland are even greater when product carbon measurement is considered.

34% of survey respondents indicated that they are facing market pressure to provide carbon metrics relating to products and services.

Further analysis showed that of these companies under some form of market pressure, 71% of these companies do not currently measure their product carbon footprint, and therefore are not meeting the requirements of their customers and supply chain partners.

This is of particular concern, as some of the world's biggest retailers, including Tesco in the UK, Migros in Switzerland and Groupe Casino in France, have made varying public commitments to put carbon labels on the products that they sell.

5.6 Businesses only view carbon measurement as relevant if they are under direct pressure to from their customers

The responses provided by companies to the survey questions suggest that many would only view carbon measurement as important if they came under direct pressure from their customers to provide carbon metrics related to the organisation and products.

For example, 28% of those respondents who do not measure their organisational carbon footprint indicated that this is because they do not currently view organisational carbon measurement as important to their business.

Further analysis showed however, that this view is more likely to be taken by respondents who do not perceive themselves to be under any market pressure to provide organisational carbon metrics. Indeed, those respondents who do not view organisational carbon measurement as important accounted for 95% of those respondents who indicated that they are not feeling any external pressure to measure their organisational carbon footprint.

A similar pattern was identified in the context of product carbon measurement.

Of the respondents who do not undertake product carbon measurement, 25% indicated that that this is because they do not view product carbon footprinting as important to the business. Again, this was strongly correlated with respondents' perception that they are not currently facing external market pressure for product carbon measurement. Indeed, those respondents who indicated that product carbon measurement is not of current importance to their business, accounted for 92% of those respondents who had previously stated that they are not under any market pressure to provide product carbon metrics.

This singular view of business benefit suggests that respondents are unaware of the other benefits that proactive carbon measurement can provide, in terms of cost reduction, regulatory compliance.

5.7 Senior management support is key to carbon measurement

Those participating companies who undertake carbon measurement were asked what challenges, if any they faced in doing so.

Only 11% of respondents who currently measure their organisational carbon footprint indicated that convincing senior management was a key challenge.

Similarly, of those companies that currently measure their product carbon footprint, only 8% indicated that convincing senior management was a key challenge in doing so.

This suggests that the support of senior managers has been key to the adoption of carbon measurement amongst those companies in Ireland and Northern Ireland who currently measure their carbon impacts.

Engagement of senior managers in those companies who do not currently measure their carbon impacts, may be key to encouraging carbon measurement amongst businesses in Ireland and Northern Ireland.

OPTIONS FOR HELPING BUSINESSES IN IRELAND AND NORTHERN IRELAND OVERCOME THE CHALLENGES AND BARRIERS TO CARBON MEASUREMENT

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6.1 Summary overview of the proposed options

The research shows that there are significant gaps in the measurement and reporting of GHG emissions amongst businesses in Ireland and Northern Ireland. This presents risks to their competitiveness and reputations in the marketplace, and to their positioning for grasping the opportunities presented by increasing trends towards sustainable procurement and consumption.

Given that businesses are a key source of GHG emissions, these trends also present risks to the achievement of targets for reducing GHG emissions in the two jurisdictions, i.e. by 20% relative to 1990 levels by 2020 in Ireland, and 80% relative to 1990 levels by 2050 in Northern Ireland.

The study showed that the low rates of carbon measurement arise from the fact that businesses in Ireland and Northern Ireland face a number of challenges in measuring and reporting their greenhouse gas emissions. These are particularly more pronounced amongst smaller companies in all sectors.

This Action Plan recommends initiatives that can be implemented by InterTradeIreland, Enterprise Ireland and Invest Northern Ireland, in partnership with trade associations, sector bodies, delivery partners and other stakeholders, to address these challenges and minimise the associated risks. The initiatives are summarised below and are grouped into three categories reflecting the planned timeframes and mode for implementation for each, namely:

- **Quick Wins:** Initiatives that can be implemented quickly using existing expertise and resources

- **Intermediate Initiatives:** Initiatives that can be implemented in the medium term, by the agencies in collaboration with delivery partners

- **Initiatives for exploration**: Initiatives that may present resourcing challenges. It is therefore recommended that the agencies explore how these initiatives could be implemented and resourced, and identify the most effective mode for implementing them.

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INITIATIVE	BRIEF DESCRIPTION
QUICK WINS	
Develop and disseminate easy-to-follow guidance for carbon measurement by SMEs	The study showed that small and micro-enterprises especially, are less likely to undertake carbon measurement. Furthermore, where they do attempt to do so, small and micro-enterprises are less likely to use formal or recognised approaches. Many SMEs indicated that the absence of appropriate guidance is a key barrier to carbon measurement.
Develop and disseminate simple and easy-to-use tools to facilitate carbon measurement and monitoring by SMEs	Given the unique challenges faced by smaller organisations, it is recommended that the agencies supplement the guidance (above) with practical and easy-to-use tools that will facilitate carbon measurement amongst SMEs. In particular, these tools should enable SMEs to track emissions over time, and not just provide a snapshot at a point in time. These tools could include, for example, downloadable and ready-to-use templates and spreadsheets, that will enable SMEs to monitor and track carbon impacts, and report them in accordance with internationally recognised guidance. Where possible, these tools should be pre-populated with formulae and emission factors specific to Ireland or Northern Ireland as appropriate.
INTERMEDIATE ACTION Provide carbon measurement training and mentoring for SMEs	Many SMEs indicated that they do not have the skills and capacity to undertake carbon measurement. There is therefore a need to build the competencies and confidence of SMEs where carbon measurement is concerned. It is therefore recommended that the agencies explore options for providing practical, focussed and customised training to help SMEs understand how to apply the guidance and tools for carbon measurement. In particular, it is important that the training is provided in a way that meets the specific needs of small and micro organisations. This may take the form for example, of practical on-site training, or mentoring arrangements that enable participants to seek advice after the formal training sessions. In looking at options, the agencies may wish to consider whether it is possible to provide the training as part of programmes that they currently provide, or through external delivery partners who may be able to provide such training and mentoring on an all-island basis

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INITIATIVES FOR EXPLORATION	
Provide hands-on support to SMEs in undertaking carbon measurement	A significant proportion of smaller companies that participated in the study indicated that they do not have the resources or capacity to track, measure and report their carbon emissions. Many SMEs also perceived carbon measurement as requiring specialist skills, and may therefore not have the confidence to attempt it themselves. It is therefore recommended that the agencies explore options for providing direct hands-on support to SMEs, to help them undertake carbon measurement. This may, for example, take the form of 1 or 2 day support from an external advisor who can work closely with staff from the company. Notably, the emphasis should be on co-working to ensure that knowledge is imparted. In looking at options, the agencies may wish to consider whether it is possible to provide such support as part of ongoing programmes, or through delivery partners who may be able to provide such support on an all-island basis.
Implement a cross-border demonstrator project to showcase best practice in product carbon measurement	The study showed that product carbon measurement presents particular challenges to companies in all sectors and of all sizes. These challenges typically arise from inadequate understanding of what product carbon measurement means in practice, and poor awareness of the associated methods, rules and inputs. In this regard, a cross-border and cross-sector demonstrator project that showcases best practice product carbon measurement could provide a number of benefits. In particular, it could help companies in Ireland and Northern Ireland understand the process and methods, showcase the benefits, and provide local exemplars and case studies from which other companies can draw lessons. Managing and supporting such a scheme could present resourcing challenges however. It is therefore recommended that the Agencies explore options for implementing the demonstrator project. In doing so, the agencies should engage sector bodies and trade associations to assess opportunities for pooling resources, etc.

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Provide a platform/mechanism to facilitate the public disclosure and benchmarking of corporate carbon footprint by companies (particularly SMEs) in Ireland and Northern Ireland	The disclosure of carbon performance can help businesses realise the reputational benefits of carbon measurement. It can also facilitate the benchmarking and incentivise the improvement of carbon performance.
	At present, there are no carbon disclosure schemes available for participation by smaller companies in Ireland and Northern Ireland. The carbon disclosure project and the league tables that will form part of the CRC efficiency scheme in the UK, for example, are both targeted at large companies.
	Recognising the potential benefits of easy disclosure for benchmarking amongst small companies, it is recommended that the agencies explore options for implementing a mechanism to facilitate the disclosure of organisational carbon metrics by businesses in Ireland and Northern Ireland. In doing so, the agencies should engage sector bodies and trade associations to assess and discuss the most suitable mode of implementation.
Develop a platform that will enable the sharing of life cycle carbon data for product carbon measurement	The study showed that one of the fundamental barriers to product carbon measurement is the difficulty in obtaining the life cycle emissions data that is required for the measurement process.
	Many companies, especially those within the same sector, are likely to have similar inputs into the production process. This provides an opportunity to share life cycle data and values, thus minimising any replication of effort.
	It is likely however, that such sharing of data will be more feasible in some sectors than others. It is therefore recommended that the agencies approach relevant trade associations and sector bodies, to assess the willingness of those bodies to lead and implement schemes to share life cycle data within their sectors.

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• Bord Bia

• Ulster Farmers Union

• Engineers Ireland

• Northern Ireland Plastics Association

• Plastics Ireland

• Northern Ireland Hotels Federation

• Momentum Northern Ireland

• ICT Ireland

• Irish Timber Frame
  Manufacturers Association

InterTradeIreland

Established under the 1998 Belfast Agreement, InterTradeIreland aims to boost North/South economic co-operation to the mutual benefit of Northern Ireland and Ireland.

InterTradeIreland's vision is for a globally competitive enterprise environment in which Ireland and Northern Ireland co-operate to ensure the optimal utilisation of economic resources, particularly knowledge resources, to drive additional trade and wealth creation.

To achieve this vision, InterTradeIreland undertakes and supports an ongoing process of research, analysis, project design, pilots, implementation, evaluation and review. Through these activities, InterTradeIreland deliver benefits in Ireland and Northern Ireland in the key areas of competitive advantage – sales and marketing, science, technology and innovation, enterprise capability development and business networks.

Enterprise Ireland

Enterprise Ireland is the government organisation responsible for the development and growth of Irish enterprises in world markets. The mission of Enterprise Ireland is to accelerate the development of world-class Irish companies to achieve strong positions in global markets resulting in increased national and regional prosperity.

Recognising the invaluable role that export sales growth can play in increasing the flow of income into the Irish economy and for job creation, Enterprise Ireland's priority is the achievement of export sales growth from Irish-owned companies.

In this regard, Enterprise Ireland works in partnership with Irish enterprises to help them start, grow, innovate and win export sales on global markets. These include a wide spectrum of businesses - from early-stage entrepreneurs, to established business owners and Irish multinational companies.

The Environment & Green Technologies department of Enterprise Ireland can help companies with managing their carbon emissions. GreenTech Support was designed to help companies with specific environmental issues including carbon management and reduction. Support is provided to put a carbon management strategy in place, measure a baseline carbon footprint and set about seeking reductions in emissions over time. Enterprise Ireland clients should contact Declan White at 01-7272480 or Tom Lowry at 061-718315, email: greentech@enterprise-ireland.com

Invest NI

Invest Northern Ireland is Northern Ireland's economic development agency.

Invest NI's overall goal is to help create wealth for the benefit of the whole community by strengthening the economy, helping it grow, increasing business productivity and boosting Northern Ireland's Gross Value.

Towards this end, Invest NI actively supports business development, thus helping to increase export levels, attract high quality inward investment, and stimulate a culture of entrepreneurship and innovation.

Invest NI focuses on three priority actions for economic growth, namely (i) Realising Client Potential, i.e., helping clients to become better at growing profitably; (ii) Shifting the Sectoral Focus, i.e., promoting a sectoral mix that incorporates higher value-added activities; and (iii) Encouraging Frontier Technologies, i.e., technologies at the leading edge of research and development.

Invest NI funds Carbon Trust (www.carbontrust.co.uk) to improve the competitiveness and productivity of Northern Ireland businesses by reducing operational costs through energy efficiency. Carbon Trust provides SME's with free guidance, advice and hosts an online tool to help businesses measure the Carbon Footprint of products and services, or organisations.

Carbon Footprinting of Products or Services based on PAS2050 methodology is supported

http://www.carbontrust.co.uk/cut-carbon-reduce-costs/calculate/carbon-footprinting/pages/product-carbon-footprint.aspx

http://www.carbon-label.com and http://www.footprintexpert.com/Pages/default.aspx

Carbon Footprinting of Organisations to the Carbon Trust Standard is also supported

http://www.carbontrust.co.uk/cut-carbon-reduce-costs/calculate/carbon-footprinting/pages/organisation-carbon-footprint.aspx

About us

InterTradeIreland is the only organisation which has been given responsibility by both Governments to boost North/South economic co-operation to the mutual benefit of Northern Ireland and Ireland. By encouraging better use of our collective resources we help to expedite trade and business growth across the island and create an environment where it is easier to do business.

We support SMEs across the island to identify and develop North/South trade and innovation opportunities. We do this through:

• **Business programmes**
• **Research and statistics**
• **Networks and partnerships**

InterTradeIreland will endeavour to facilitate requests for alternative formats of this publication including Irish Language, Ulster Scots, Braille, disk and audio cassette.

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