

The Four Dimensions of Sustainability

A Framework for Material and Consistent Corporate Action

Introduction

Reducing impact on climate change is a challenge many companies are trying to tackle. Businesses need to take a leadership role in reducing carbon footprint across the globe. Leading companies that develop a comprehensive strategy will save money, increase productivity and gain a competitive edge over those that fail to make any changes. The good news is many organizations are up for the challenge but many are unsure of where to begin among the myriad of activities on the table.

This paper proposes a framework to facilitate development of a sustainability strategy. The framework can be used to evaluate the overall scope of current sustainability initiatives, and identify and recommend new actions. It can also be used to provide a structure for critical analysis of an organization's existing sustainability strategy. The approach was developed from examples of programs at BT and from partners and suppliers that are committed to making a difference.

The framework may be applied to the economic, social and environmental sustainability of the communities in which companies operate. However, for consistency, this paper's illustrative examples reflect environmental sustainability. Particularly, the examples are drawn from carbon emissions reduction.

Four broad dimensions of potential action are identified and represented diagrammatically by four concentric circles as shown in Figure 1.

Direct - the emissions due to the energy consumed and paid for by the company (directly or indirectly) to carry out its activities.

Products In Life - the emissions due to the energy consumption of a company's products and services once in the hands of the consumer, or end-user.

Enabled Impact - the impact that a company's products or services have on the energy consumption and emissions of the entity that utilizes the product other than the consumption of the product itself.

Inform and Influence - the opportunity to inform or influence stakeholders on environmental issues and their impact on the stakeholder and on the company.

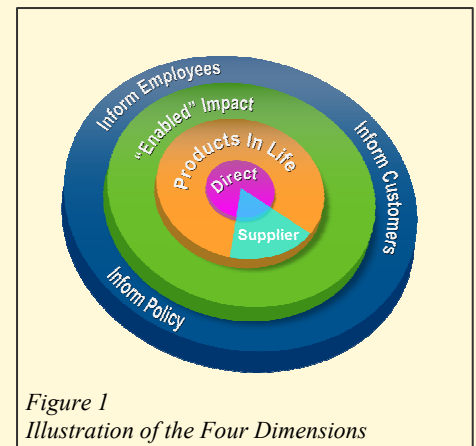


Figure 1
Illustration of the Four Dimensions

The paper concludes that different industry sectors have contrasting material impact in different dimensions of the framework; that effective sustainability impact comes from taking a consistent approach across all the material dimensions for that company and that most attention should be focused on those segments that are most material. The corollary being that taking conflicting positions on sustainability in different dimensions can be a strong indicator of what has become known as greenwash.

Direct Impact

The bullseye of the illustration depicted in Figure 1, represents the *direct* impact that a company has on environmental sustainability. It is defined by the emissions due to the energy consumed and paid for by the company

(directly or indirectly) to carry out its activities.

Direct emissions are probably the best known of the four dimensions in this framework and are most commonly considered to be defined by the greenhouse gas emissions (GHG) guidelines. This includes carbon emissions resulting from on site power generation, electricity consumption, fuel usage, travel fleet operations and other activities that are directly carried out by the corporation or on its behalf. Objectives are quantifiable and there are a growing number of consultancies and software packages that specialize in collecting and presenting this data. Measurable objectives can be set using intensity or absolute targets with many organizations now aiming to be carbon neutral by a certain date.

Partly because of these available structural approaches, *direct* emissions are where companies often focus their initial attention.

For example, at BT, using UK reporting guidelines, *direct* carbon footprint was reduced from 1.6M tonnes to 0.6M tonnes between 1996 and 2008. This was achieved through a combination of business process change, energy efficiency measures and renewables.

A significant proportion of that reduction has been enabled by vendors. This is reflected in the *supplier wedge* shown in Figure 1. For example, as part of the BT's 21st Century Network design, work with vendors enabled an increase in the operating temperature of network data centers and so a reduction in the energy consumed. [see sidebar 'Thinking Out of the box'] **PepsiCo** has a comprehensive engagement program with its vendors which includes an annual sustainability summit, support from PepsiCo consultants to develop environmental plans, a vendor questionnaire and a commitment to recognize and reward vendor action on sustainability priorities.

ICT¹ companies tend to have smaller *direct* footprints than those in transport, manufacturing and energy, so why focus so much attention on this dimension of action? *Direct* emissions reductions provide the experience and mandate for a company to actively work with its customers and other stakeholders on other ways to reduce their emissions.

Products In-Life

Products in-life comprises the emissions a company's products and services have once in the hands of the consumer, or other end-user. While the products of some industry sectors have little or no energy consumption in use and so very minor *in-life* carbon emissions, others have significant *in-life* emissions. The fuel or electricity used to power these products is paid for by the end-user and so is the end-user's *direct* footprint. The consumer has some control over consumption; leaving a computer on standby or switching it off, speed and acceleration in a car, using rechargeable or disposable batteries, etc. However, although the consumption may be significantly influenced by the end-user, the manufacturer is very much complicit in the emissions (or other environmental impact) through the availability of the product, the way it is designed and the guidance provided for its use.

For many businesses, *product in-life* emissions can be far greater than *direct* emissions. Looking at the 2006-07 corporate social responsibility report from **Ford** shows that their direct emissions in 2005 were about 8M tons CO₂. In contrast, *product in-life* emissions - through the fuel usage of their on road fleet across the world were about 407M tons. For a telecommunications company selling routers and phones, *direct* and *product in-life*

Thinking Out of the Box

It may seem counter-intuitive, but raising the operating temperature of the equipment in a data center reduces the energy consumed. Data center servers, like any other computer hardware, have specified operating temperature ranges to ensure effective operation, minimize downtime and optimize life. Operating outside of these ranges compromises these variables and invalidates warranties. But these ranges have changed little since the early days of large main frame computers when data center standards were established and became the norm. As BT worked with vendors to specify 21CN design, these operating temperature ranges were questioned. Many of the selected vendors responded positively, allowing the flexibility to raise the operating tolerances of the equipment by a few degrees without affecting performance. One of the most significant components of data center energy consumption is providing air conditioning to ensure ambient temperatures within the ranges specified by the equipment manufacturers. In increasing the upper end of those temperature ranges by only a few degrees, significant reduction in air conditioning is enabled, significantly reducing energy costs and carbon emissions. The new network also consolidated many of our smaller switch sites in a fewer number of larger locations, also greatly reducing energy needs. BT is now working with IT industry sustainability organizations like Green Grid to achieve broader changes in accepted standards.

emissions are of a similar order of comparative magnitude to each other. For a clothing company, whose product does not consume energy once in the hands of a customer, *in-life* emissions may be zero.

Where *in-life* emissions are significant, actions can be taken by businesses to reduce them. Ford's sustainability report identifies the actions they are taking, and all enlightened ICT companies are working to reduce the consumption of their products and give the end user more control in reducing consumption through such features as standby modes.

As with *direct* impact, suppliers can also play a significant role in reducing *in-life* impact. While many companies outsource their product manufacturing, this does not diminish their responsibility for specifying the product characteristics. For example, early in 2008 BT started a six month program to replace the entire range of DECT² phones with a new line of phones with about half the energy consumption of their predecessors. This resulted from working with vendors in the prior year on product redesign. Hence, in the chart, the *supplier* wedge intrudes into both the *direct* and *product in-life* categories.

For industry sectors with little or no impact in this category, focus should remain on *direct* emissions.

Enabled Impact

Enabled Impact is the third concentric circle. In contrast to *in-life* impact, which addresses the energy consumption of the device or service itself, *enabled* impact focuses on the impact that a product or service has on other aspects of the energy consumption and emissions of the entity (the individual, company or community) that utilize the device or service.

BT completed a study with Forum for the Future in 2004, which showed that the rollout of broadband services increased the propensity of customers to buy and to use a range of other energy dependent electronic equipment. While that equipment included computers and peripherals not purchased from BT -- so not *in-life* impact - their usage was enabled or even encouraged by our rollout of broadband, hence the term *enabled* impact.

Fortunately, in the ICT sector this increased energy usage is more than offset by a beneficial impact of the ICT industry as a whole. Many papers have been written on the positive enabled impact of ICT services³. The best known example is using teleconferencing instead of traveling for meetings. The teleconferencing service requires electricity to power it and so has an associated emissions burden. But, compared to the emissions reduction resulting from avoiding travel, that burden is small. The side bar "ICT Sector as an Enabler" describes some of the many other examples of *enabled* benefit in the ICT industry. Estimates of the *enabled* beneficial impact of the industry range from 5 times to 15 times the burden of the industry. Actions with the *enabled* dimension are therefore among the most material ways in which the ICT industry can impact global emissions.

There are many examples of products and services with *enabled* benefits outside of the ICT sector ranging from a lubricant that improves the energy efficiency of a production line to a sophisticated process reengineering consultancy service. Opportunities for action in the *enabled* dimension tend to fall into one of three categories (1) efficiency improvement of an existing service (2) substitution for a more energy intensive service and (3) environmental services.

Inform and Influence

The outer ring of our framework is the opportunity to *inform and influence* the actions of others for the purpose of reducing negative impact on the environment. Unlike the earlier three categories, this one cannot be quantified. However it is equally as important. A company's actions to *inform and influence* its stakeholders can help remove the hurdles which companies sometimes find themselves facing where scope of action is restricted by

¹ICT – Information Communications Technology. This terminology is employed to reflect the increasing interdependence of the IT and telecommunications industries. Historically separate, both in terms of industry sectors and in terms of functional departments in a business, the increasing interdependence between IT and telecommunications is evident in the increasing overlap between the industry sectors and the merging of traditional IT and communications departments in many corporations. This interdependence is reflected in the use of the terminology 'ICT'.

the real or perceived limitations placed on them by shareholders and customers. The wrong actions in this area can also be the test of what has become known as ‘greenwash’.

Inform and influence can be considered with respect to all of a company’s stakeholder groups including customers, employees, government and shareholders.

Opportunity to inform public opinion is probably the most material opportunity to impact climate change for media and communications companies. **NewsCorp** is probably one of the best examples of a media company taking a [public stance](#) on this. In addition to commitments to reduce their own carbon footprint NewsCorp have made a public commitment to

“Engage our employees, our business partners and our audiences on the issues of energy use and climate change”

Companies with a well recognized consumer brand name also have a significant opportunity to inform customer and public opinion. This can take the form of publicizing their own commitments and activities, providing tools, such as carbon calculators, and even providing marketing incentives for the public to take action.

BT uses its brand in the UK to engage the general public through a range of [tools](#) including calculators, games and competitions.

Xerox provides a [calculator](#) designed to document the impact of the services provided by the company that allows customers to make a quick, Web-based assessment of how-to advice on smart ways to make offices greener.

Similarly, **Nortel**’s energy [calculator](#) is a more explicit demonstration of energy savings for competitive differentiation.

For the employee stakeholder representative engagement efforts include grass roots programs, websites and competitions, among others. **Walmart** has a PSP (Personal Responsibilities Program) which includes encouraging employees to put forward plans for improving sustainability in stores. BT runs a program called carbon clubs.

What are the most engaged companies doing in the employee space? They are educating their people not only on the actions they can take in the workplace, but about those they can also take at home and in other aspects of their personal lives. At BT, staff is encouraged to take action outside of the workplace through a Living Lightly program. HP provides a subsidy and a [program](#) to incentivize employees to implement solar installations at home.

Traditionally, most companies have focused their government interactions on activities that are deemed core to their immediate business. As climate change and other areas of sustainability become more top-of-mind, we are seeing that focus broaden. In the UK, for example, a group of prominent companies, including BP, BT, Ford and Barclays, formed a Climate Change Task Force under the auspices of the Confederation of British Industry to present the corporate perspective on climate change to government leaders. According to their report:

“The best question for the business community is whether we can be certain that climate change presents a substantial risk; a risk that will have a profound impact on society and the economy? To this the answer is clearly ‘yes’. And so, as with all substantial risks, it is vital to mitigate the danger.....Any response to the threat of climate change requires three components for success. Politicians must give much greater priority to the subject, and not just on an

²DECT stands for Digital Enhanced Cordless Telecommunications and is the latest industry standard for the cordless phones we are all accustomed to now in our homes where there is no cable required to connect the receiver to the base and that allows for phones to be placed all around the home without requiring individual connections to the network for each handset.

³The most recent and probably most comprehensive is [SMART 2020](#) produced by GeSI and the Climate Group in June 2008

ad hoc basis. Consumers have to be empowered to make the right decisions and need to be given the facts to make informed judgments. And business must become green to grow.”

This initiative represents a compelling example of the role of business in informing and influencing government in this area.

Informing shareholders is vital to ensure their understanding and support for key actions. For many companies that are active in this area, this is accomplished through the annual sustainability report. Statements such as follows from the 2008 sustainability report of Omron, Japanese manufacturer of sensing devices and control systems make unequivocal the company's position on a key sustainability issue and help inform the views of the shareholder;

“As reported by the Intergovernmental Panel on Climate Change (IPCC), the fight against global warming is considered to be one of society's most urgent issues. Reflecting this belief.....we are determined to promote anti-global warming measures as our most important management objective.....”

Companies often state that they can take only as much action as their shareholders and customers will tolerate and as government legislation will enable. But those same companies are able to *inform and influence* those stakeholders. In fact they are often expert at doing that through core competencies in marketing, employee communications, government relations and investor relations. Including action in the *inform and influence* category is a critical component of a comprehensive sustainability program.

Conclusion

The framework identifies four discrete segments of a holistic approach to sustainability. As the examples hopefully illustrate, different industry sectors have different material impacts against the four categories of the framework. The biggest impact of a food and nutrition company is *direct* emissions – and much of that might be due to supply chain. The auto industry, in contrast, has its biggest impact through *product in-life* emissions. A telecommunications company like BT has the greatest impact through its positive impact on *enabled* emissions and a media company like NewsCorp, in turn, through its ability to *inform and influence* the public.

Companies should be able to quantify their impact in each of the first three dimensions and map their activities against the materiality of that category. Such an analysis will help identify what organizations *should* be doing and contrast this with what they *are* doing in each space. The top priorities and gaps will become evident.

The framework also serves as a tool for testing whether a company is truly consistent in its approach to sustainability. While action is not required in every category on a specific issue, inconsistent action across the categories of the framework deserves careful attention. In most cases, a company should consider starting its activities

ICT Sector as an Enabler

There are many ways in which IT services help reduce emissions and have potential to do so much more in the future. Curtailed travel substitution is one of the best known, i.e., replacing in-person meetings with teleconferences and enabling tele-working to avoid commuting. More sophisticated transport reduction opportunities also come from installing wireless devices in vending machines to reduce required visits from stocking fleets, GPS to improve vehicle routing, congestion control in cities to improve traffic flow, using the Internet to provide real-time traffic advice to commuters, etc.

Effective IT infrastructures in buildings have enabled reductions in real estate of up to 30% through creating more flexible workspaces that allow the same space to serve more employees. Such 'smart buildings' save energy partly through including a range of ICT services such as monitoring and control of building environment to enhance use of natural daylight and external climate, and better monitoring and control of building use without relying on individuals to switch of the lights or close the windows.

The Internet and similar private networks have greatly reduced quantity of paper used for commercial transactions such as billing and information provision. Smart Grid describes a concept through which user demand, power station supply and pricing are all connected on a more granular, real-time basis to allow great improvements in grid efficiency.

The potential benefits due to these and many other examples can be quantified and compared to the carbon burden of the ICT industry (considered to be 2-3% of global emissions). In fact, the recent report from Climate Group and GeSi SMART 2020 concluded that a five-fold benefit could be realized by the industry as a whole by 2020.

in the central category to gain knowledge and experience, and work outwards from there. Skipping action within a category may be appropriate because there is no impact in that space, but it may also indicate lack of commitment.

Also important is inconsistency between action in the outer ring of *inform and influence* and action in the three inner rings. Action in *inform and influence* that is intended to improve sales or brand, without equivalent level of action in the three inner categories effectively defines 'greenwash' in the environmental sustainability arena. Companies guilty of this form of misrepresentation present a green façade to their stakeholders, while operating in a manner that pays little or no heed to the actual impact of their actions. Likewise, positive action in the central ring/s while continuing material negative actions in outer rings; lobbying against appropriate regulation or reducing direct footprint while continuing to produce ever less efficient products for example, is counterproductive for the environment and should be called out by stakeholders.

This framework is intended to provide a consistent model that allows for introspection within a company, comparison with companies within a sector and across sectors and critical analysis from external observers. In so doing it strives to add to the tools available to continually improve sustainability within the business world.



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